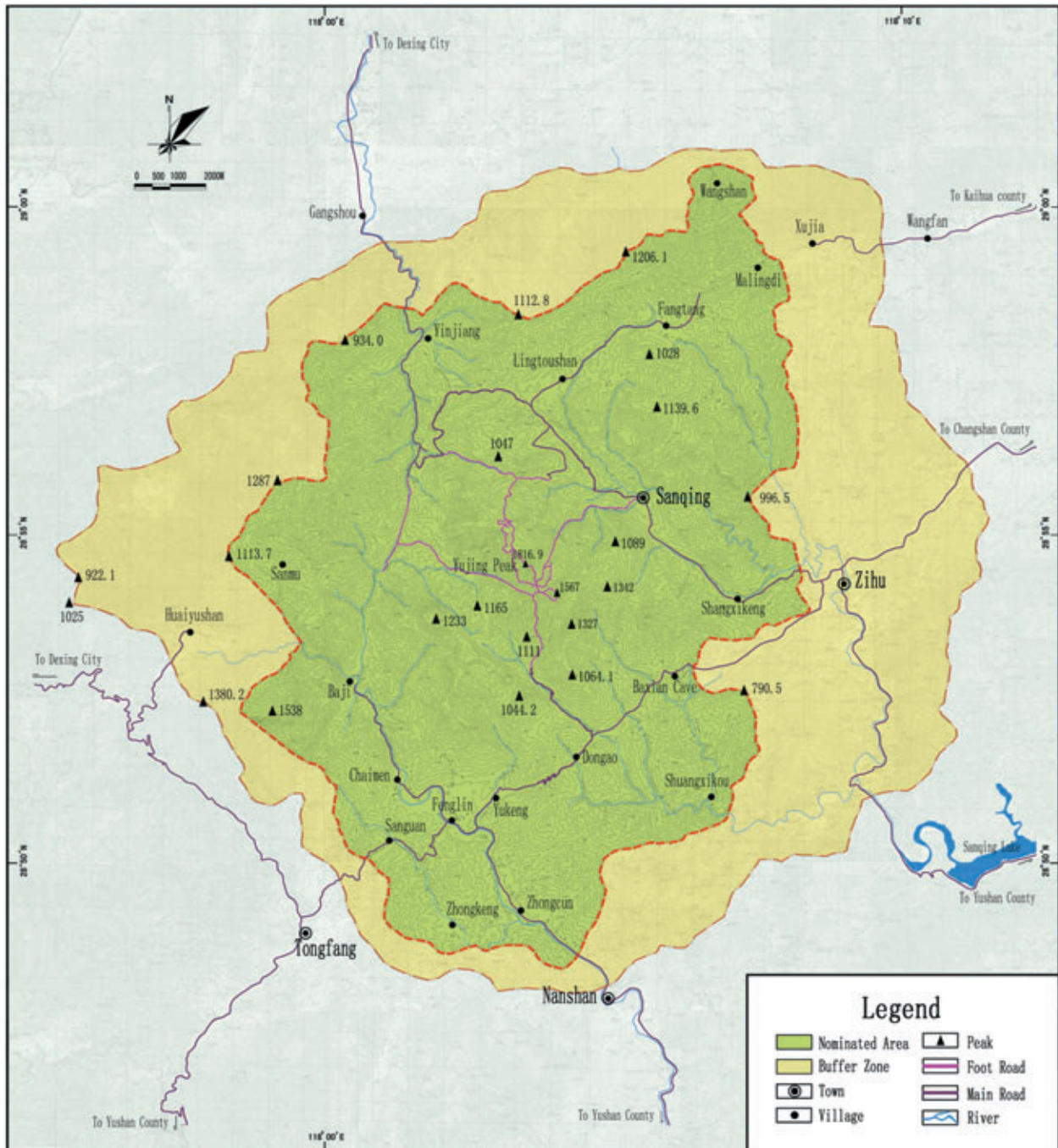


EXECUTIVE SUMMARY

| State Party | People's Republic of China |
|---|--|
| Name of Property | Mount Sanqingshan National Park |
| <p>Criteria under which property is nominated (itemize criteria)</p> | <p>Criterion (vii): contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.</p> <p>Criterion (viii): be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.</p> <p>Criterion (ix): be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.</p> |
| <p>Name and contact information of official local institution/agency</p> | <p>Name: Ministry of Construction of People's Republic of China Address: No.9, Sanlihe Road, Beijing, the People's Republic of China Zip Code: 100835 Tel: +86-010-68393014 Fax: +86-010-68393014 E-mail: zuoxp@mail.cin.gov.cn, npo@mail.cin.gov.cn</p> <p>Name: Management Committee of Sanqingshan National Park Address: Sanqingshan, Shangrao City, Jiangxi Province, China Zip Code: 334703 Tel: +86-793-8225817 Fax: +86-793-8225373 E-mail: sqswzh@126.com</p> |

Detail of the Mount Sanqingshan Nominated Property



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1. IDENTIFICATION OF THE PROPERTY

- 1.a Country
- 1.b Province and City
- 1.c Name of Property
- 1.d Geographical Coordinates
- 1.e Maps and Plans Showing the Boundaries of the Nominated Property and Buffer Zone
- 1.f Area of Nominated Property and Proposed Buffer Zone



1. IDENTIFICATION OF THE PROPERTY

1.a Country

The People's Republic of China

1.b Province and City

Jiangxi Province, Shangrao City

1.c Name of Property

Mount Sanqingshan National Park

1.d Geographic Coordinates to the Nearest Second

N 28° 54' 57" E 118° 03' 52"

1.e Maps and Plans Showing the Boundaries of the Nominated Property and Buffer Zone

Fig.1.1 Location of Mount Sanqingshan Nominated Property in China

Fig.1.2 Location of Mount Sanqingshan Nominated Property in Jiangxi Province

Fig.1.3 Satellite Imagery of Mount Sanqingshan Nominated Property

Fig.1.4 Detail of Mount Sanqingshan Nominated Property

Fig.1.5 Relationship of Mount Sanqingshan Nominated Property to Protected Area

1.f Area of Nominated Property (ha.) and Proposed Buffer Zone (ha.)

| | |
|----------------------------|-----------|
| Area of Nominated Property | 22950 ha. |
| Buffer zone | 16850 ha. |



Fig.1.1 Location of Mount Sanqingshan Nominated Property in China

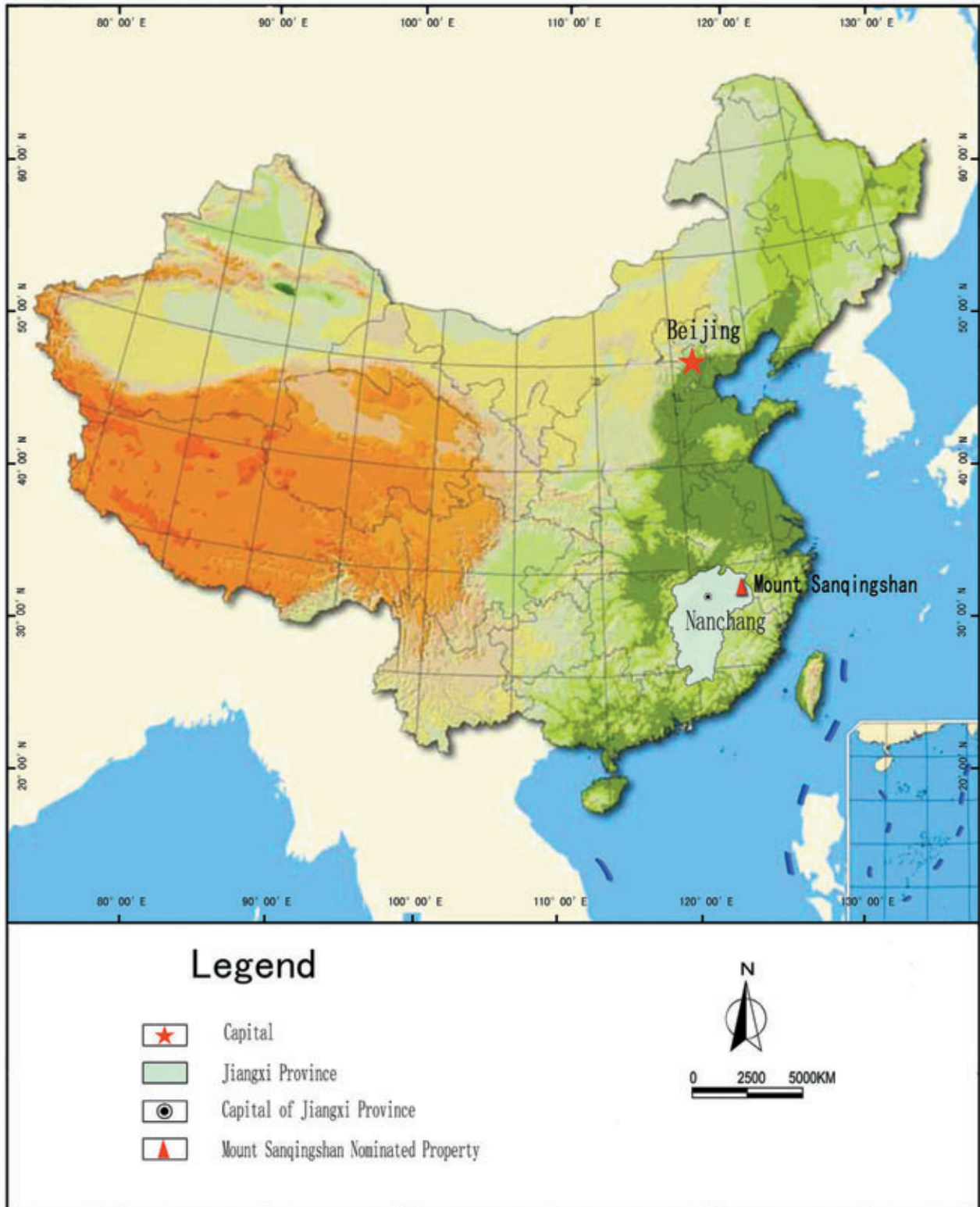




Fig.1.2 Location of Mount Sanqingshan Nominated Property in Jiangxi Province

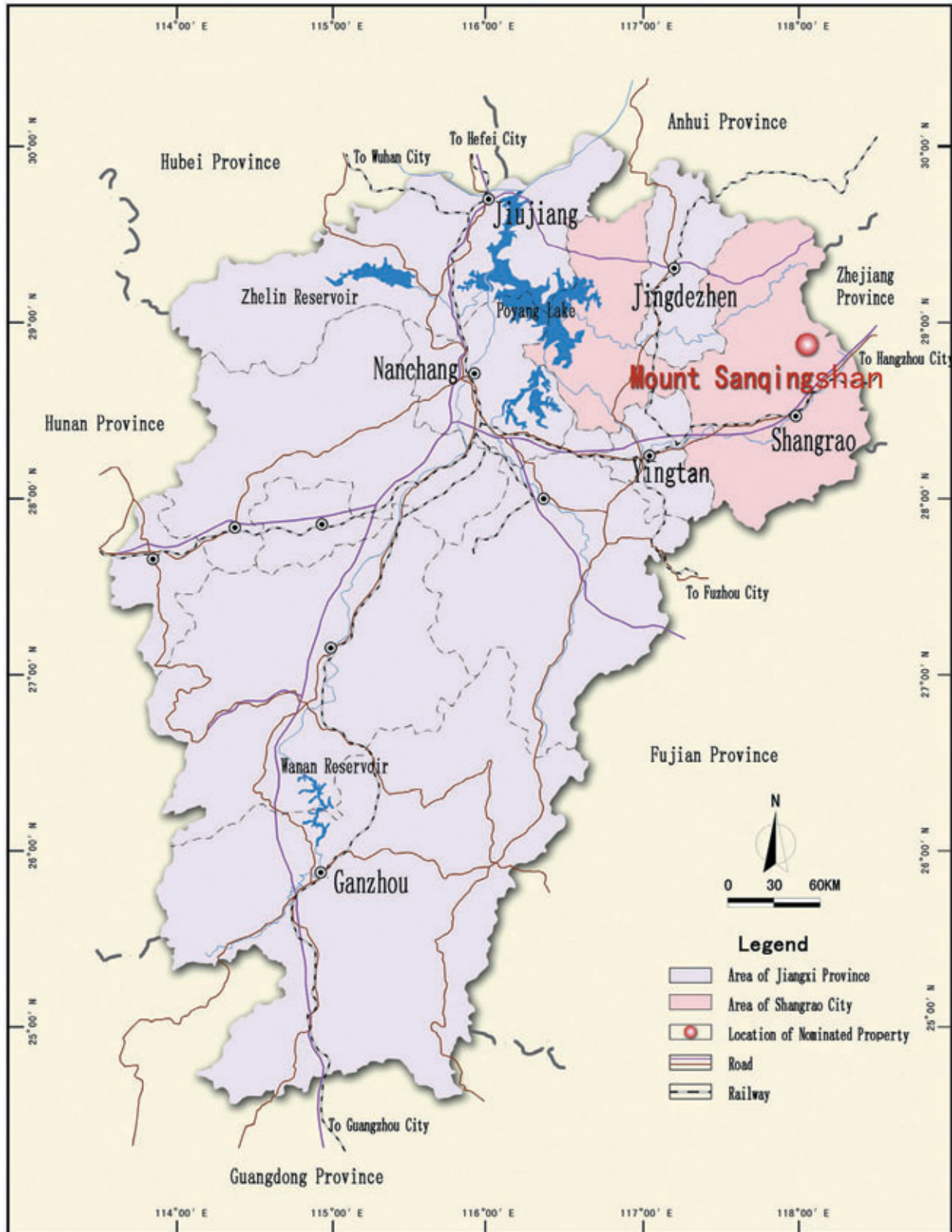


Fig.1.3 Satellite Imagery of Mount Sanqingshan Nominated Property

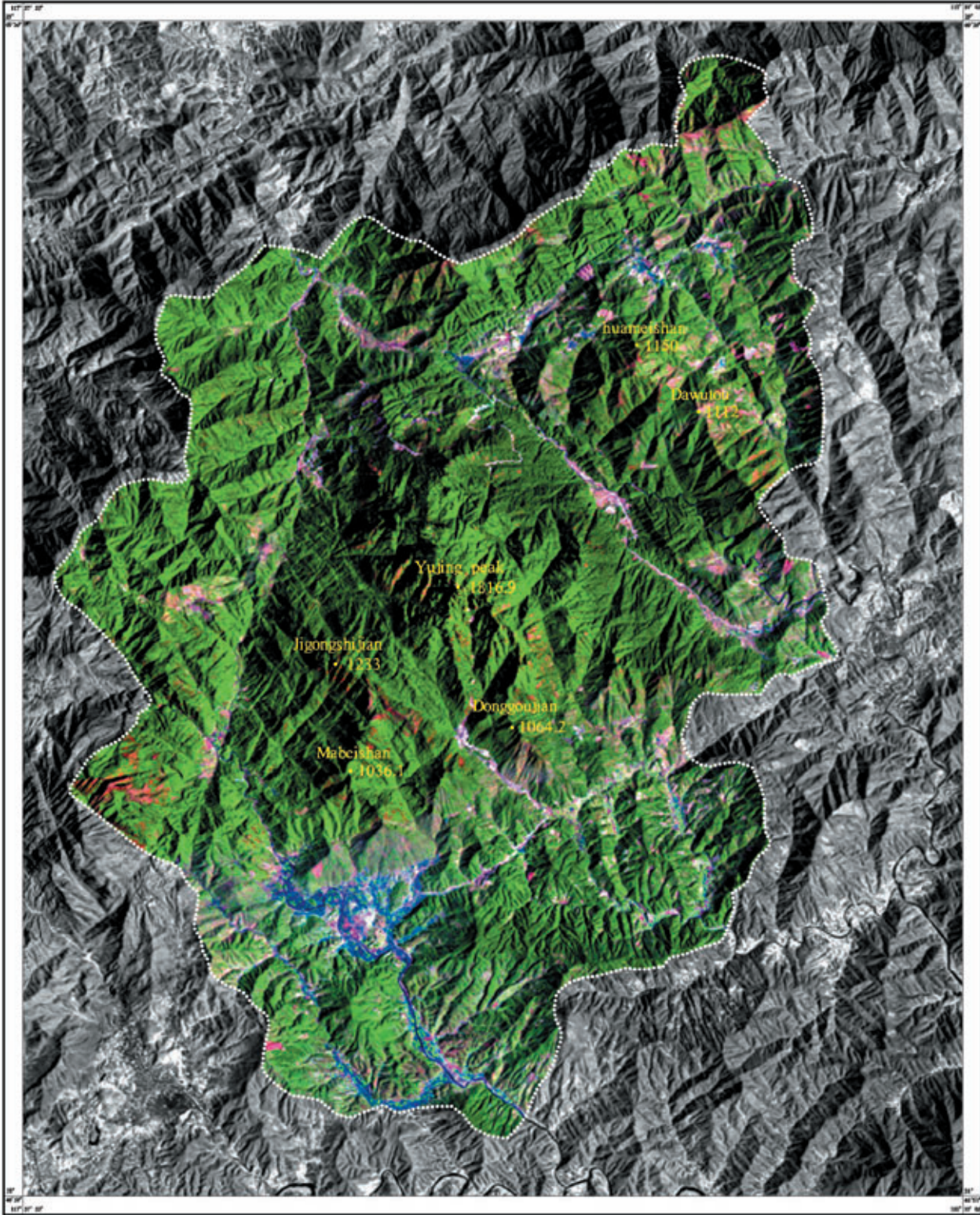


Fig.1.4 Detail of Mount Sanqingshan Nominated Property

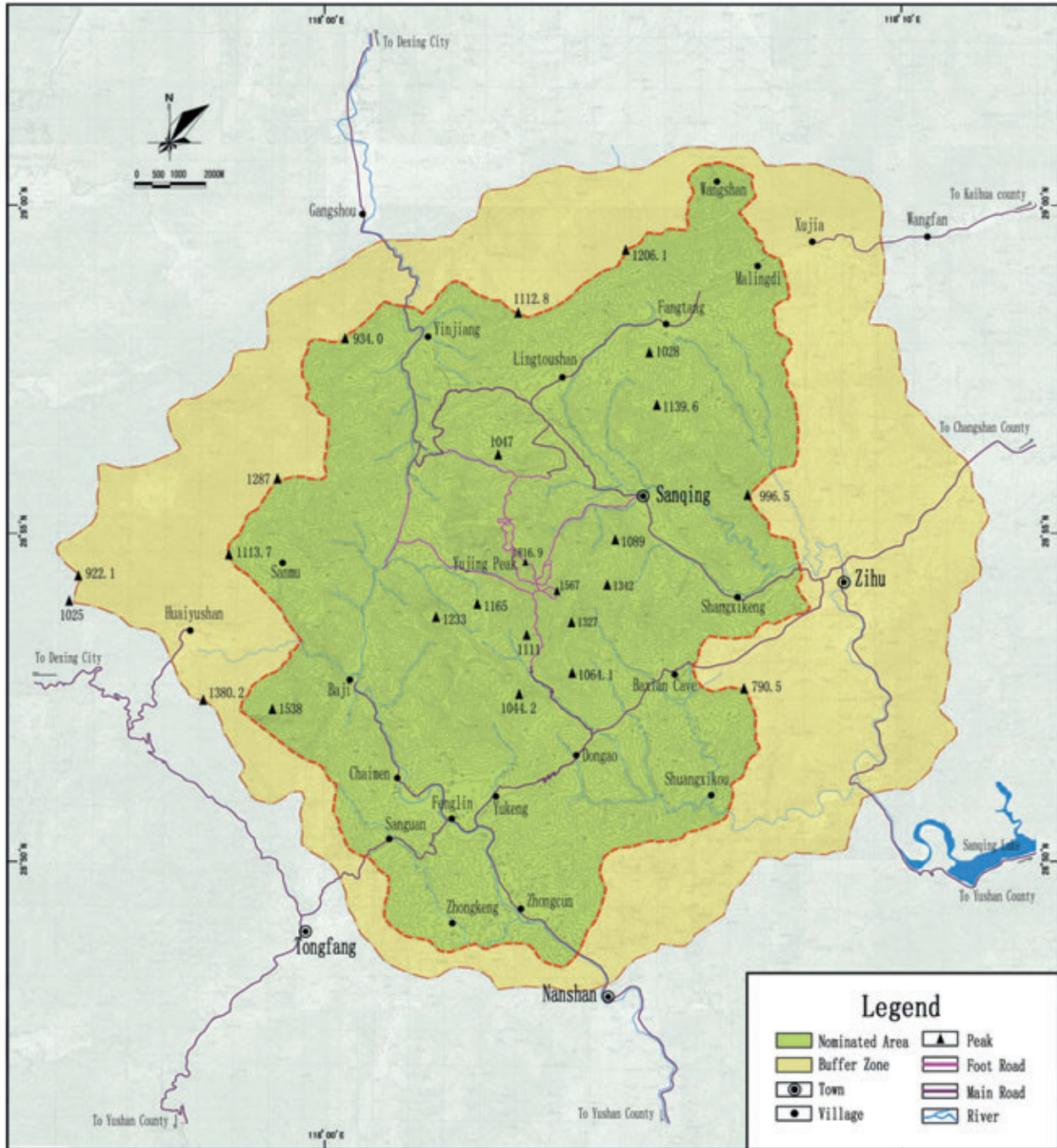
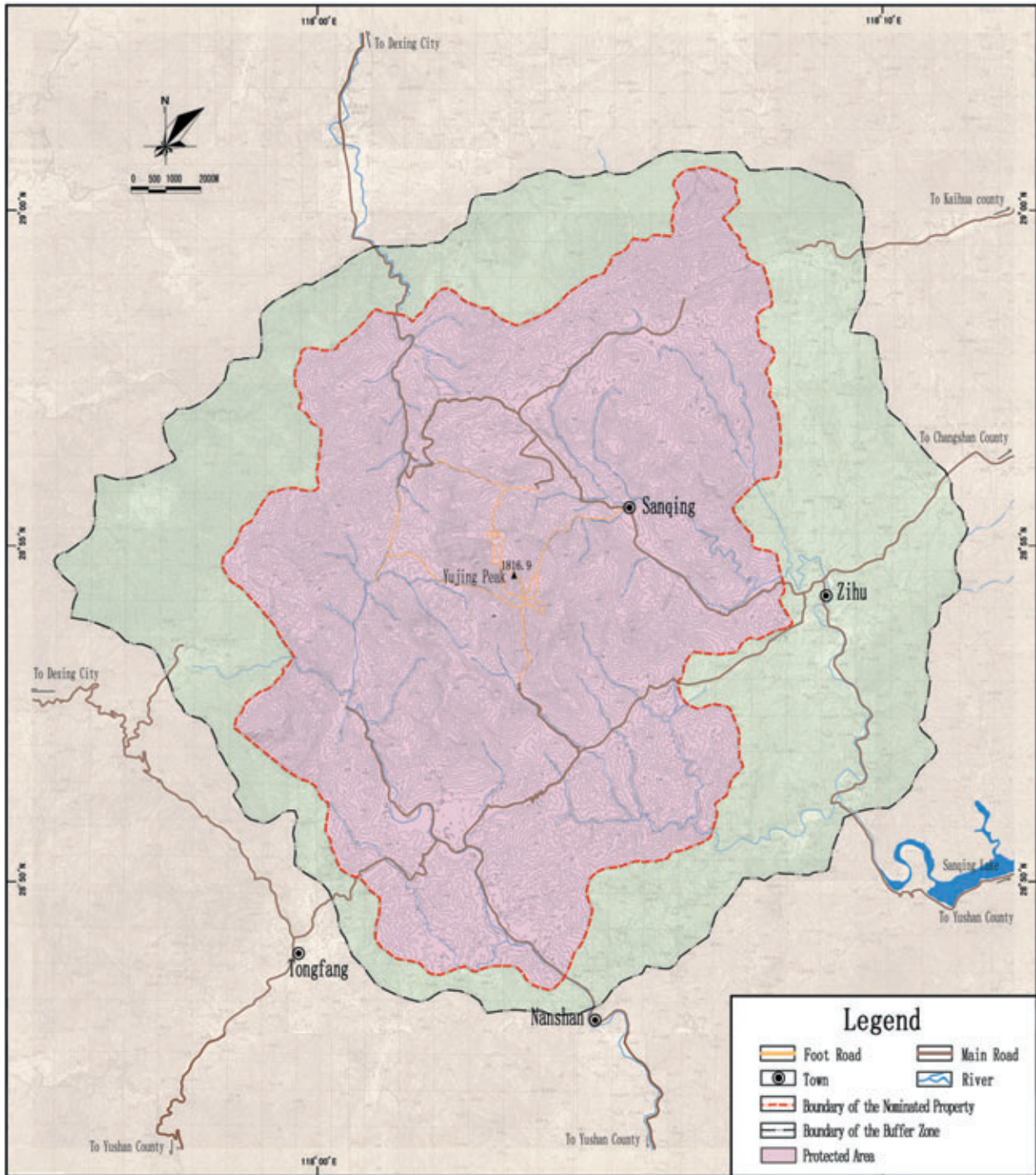


Fig.1.5 Relationship of Mount Sanqingshan Nominated Property to Protected Area





CHINA

SANQINGSHAN

2. DESCRIPTION

2.a Description of Property

2.b History and Development



2. DESCRIPTION

2.a Description of Property

Mt Sanqingshan is a spectacular granite mountain massif and the highest part of the Huaiyu mountain range, reaching an altitude of 1,816m a.s.l. at Yujing Peak. It occupies a part of a crustal suture zone (Suzhou-Dexing Fracture Zone) dating from the time of the formation of the Rodinia supercontinent in the late Neoproterozoic Era. With nearly 1 billion years of almost continuous geological evolution, and possessing evidence in its stratigraphy of many of the world's great geological events, Mt Sanqingshan is a pre-eminent world location for the study of the history of the Earth and plate tectonics. However, impressive as the geology is, the granite mountainous geomorphology, biodiversity and aesthetic qualities of the site are of equal international importance. Weathering and erosion of the granite has sculpted a wealth of remarkable landforms at a variety of scales, while the forest vegetation that clothes the mountain slopes contains world-ranking biodiversity and harbours internationally important rare and relict species. Together these features form a stunning visual landscape of towering peaks, columns, ridges and naturally sculpted life-like forms, all accessible in broad vistas and enhanced by seasonal meteorological effects.

2.a-1 Physiographic Features

Topography. Mount Sanqingshan is located in the west of the Huaiyu mountain range. It has rugged mountain relief formed as a result of rapid uplift of a faulted granite block, a wet climate and deep dissection by flowing water of highly jointed granitic bedrock. The relief of the mountain is steep on the east, south and west sides, but on the north it is gentle. Slopes generally rising over a horizontal distance of approximately 5 km from a height of 200m in the foothills to 1816.9m at Peak Yujing.

Climate. Climate and altitude are fundamental influences on the geomorphology and ecology of Mount Sanqingshan. Located 340 km west of the East China Sea, the mountain environment is affected by maritime weather and belongs to the middle sub-tropical monsoon climate type. However, because of its height, Mt Sanqingshan also experiences altitudinal climatic variation. The year has four distinctive seasons: a cold and rainy spring, a hot and rainy summer, a dry autumn, and a cold and humid winter, when the mountain-tops may be covered with snow. While the annual average temperature is 10.9°C, the average for July is 21.1°C, and the maximum temperature in July and August is 33°C. The minimum temperature in January is -16.0°C. Annual average rainfall is 1857.7 mm, while annual evaporation is 1331.6 mm. Annual average relative humidity is 82%.

Hydrology. Mount Sanqingshan is located in the middle part of the Yangtze River basin. Most of the drainage from the mountain forms a headwater of the Xinjiang and Qiantang River, then flows south of Sanqingshan, eventually draining into Poyang Lake. The surface drainage begins as a network of creeks and these join to form larger rivers in the southeast of the property. On the northern side of the mountain streams join into the Le'an River, that also empties into Poyang Lake. Rainfall and direct runoff is the main

source of surface water, which also percolates through structural fractures before draining into the gorges and valleys. Surface water is most plentiful in the spring and summer rainy seasons, but is scarce in autumn and winter. While the rock is not porous, water does penetrate the fractures and some groundwater storage exists within the rock body.

2.a-2 Geology

Tectonic setting

The nominated property is located within the area of collision between the Yangzi and Cathaysia Paleoplates, at the northwestern edge of Huaiyu terrain. It forms a part of the southeastern side of Suzhou-Dexing Suture Zone that cuts the continental crust of East China in a NE-SW direction and dips to northwest (Fig. 2.1). Isotope ages of the ophiolite melange and glaucophane schist within the fracture zone indicate that it was initially formed by the collision of palaeoplates during the Neoproterozoic Era ($850 \pm 10\text{Ma.}$). In addition, this suture was subsequently affected by intracontinental subduction during the Mesozoic (170-115Ma.). The granitic intrusions associated with this zone are represented by the Huaiyu mountain, of which Sanqingshan's Yujing Peak (1,816m) is the highest point. Data from the Yongping - Jiujiang man-made earthquake indicates that the fracture zone was deep enough to influence the Mohorovičić Discontinuity.



Fig. 2.1 Location of Mount Sanqingshan in respect of the Earth's Geotectonic Framework (after Strahler, 1977)

The nominated property overlies the south flank of an anticlinorium and is cut by the NE-SW striking Fenglin-Zihu Fracture Zone, the NNE-SSW striking Xiaoken-Bajiaoou Fracture zone and the NW-SE striking Egongling-Xiaixiken Fracture Zone to form the Sanqingshan triangular faulted block (Fig. 2.2). Originally the NE-SW striking faults were thrust faults, while the NNE-SSW were left-lateral strike slip and the NW-SE were of extension, or extension-shear, character. During the late Mesozoic/early Cenozoic Himalayan extension period (Table 2.1) all of these faults were transformed into normal faults. Today three dominant normal faults, known as the Fenglin-Zihuzheng fracture zone, the Xiaoken-Bajiaoou fault and the Egongling-Xiaixiken fault, cut the main body of Mt Sanqingshan to form a triangular shaped block (Fig.2.3). While regional uplift created the Huaiyu mountain range, further uplift of the triangular-shaped fault-block culminating in the Yujing Peak, providing an 'uplift on uplift' structure. It is this unusual structural uplift that controlled the formation of Mt Sanqingshan and its spectacular geomorphology.

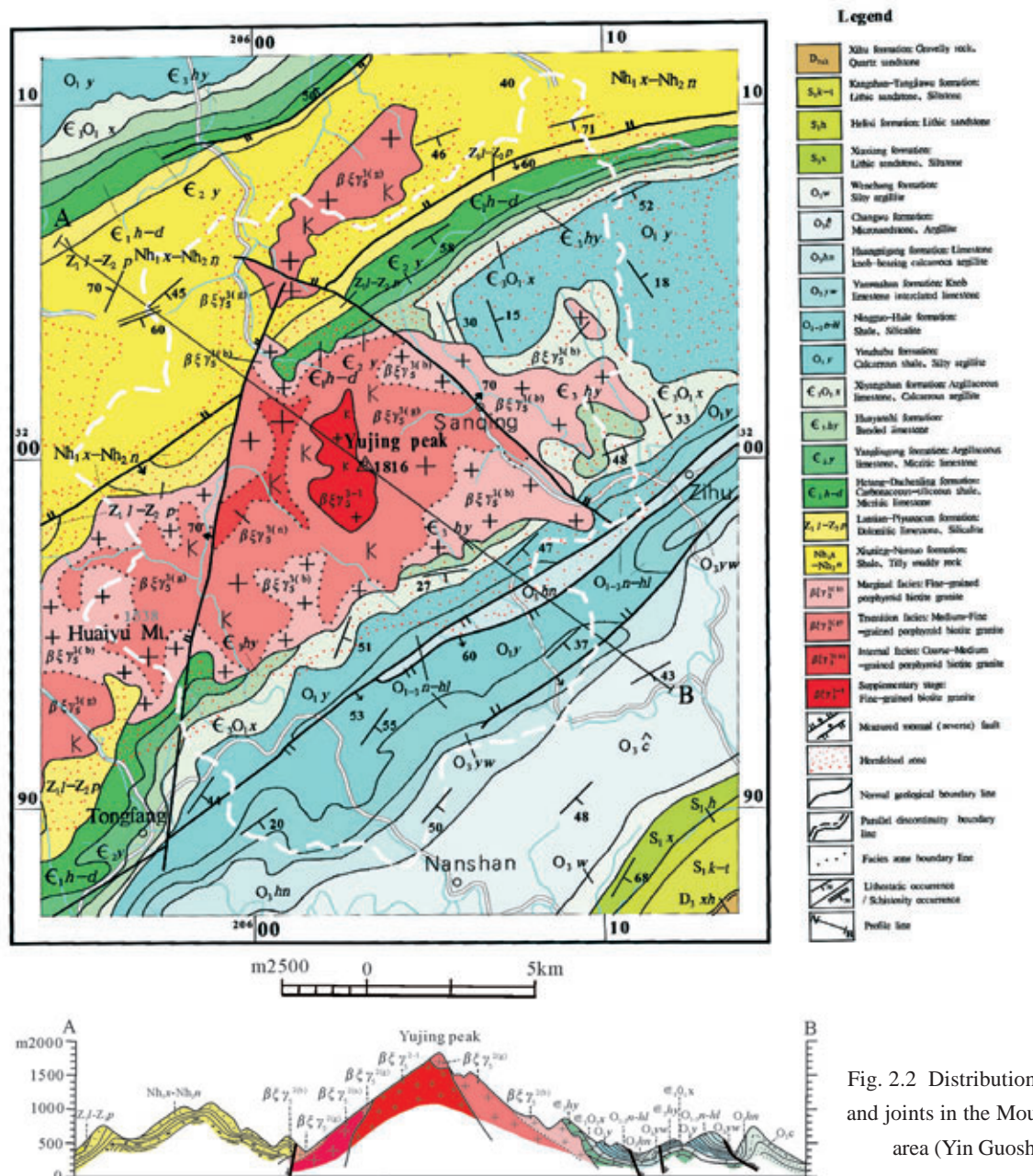


Fig. 2.2 Distribution of major faults and joints in the Mount Sanqingshan area (Yin Guosheng, 2006)

Table 2.1 Stratigraphy of the Mount Sanqingshan area

| Geologic Time | | Age (Ma) | Main Tectonic Movement | Geotectonic Epoch | Main geological Events | Organism Evolution Period | | | | | | |
|-----------------|---------------|----------|------------------------|---------------------------------------|--|---------------------------|-----------------------------|--------------------|--------------------------|--|--|--------------------------|
| | | | | | | Fauna | | Flora | | | | |
| Cenozoic | Quaternary | 0.6 | Himalayan Movement | Himalayan | Formation of Basin and range landscape | Human | | Modern plant epoch | | | | |
| | Neogene | 23.3 | | | | Mammals | Extinction of dinosaur | Angiospermae Epoch | Angiospermae flourishing | | | |
| | Paleogene | | | | | | | | | | | |
| Mesozoic | Cretaceous | 65 | Yanshanian Orogeny | Yanshanian | Intensive block faulting | Reptile Epoch | Extinction of dinosaur | Gymnospermae Epoch | Angiospermae appeared | | | |
| | Jurassic | 137 | | | | | | | | Indo-China Orogeny | Intracontinental subduction orogeny | |
| | Triassic | 205 | Indo-China | Magma intrusion and volcanic eruption | | | | | | | | |
| | | | | | | | | | | | | |
| Late Paleozoic | Permian | 250 | Variscan Movement | Variscan | Intracontinental orogeny, crust folding, formation of Eurasian Plate | Amphibian Epoch | | Spore Epoch | Gymnospermae appeared | | | |
| | Carboniferous | 295 | | | | | | | | From Tetyan Passive Continental Margin to formation Eurasian Continent | Continental block extension and Transgression of Tethyan Ocean | |
| | Devonian | 354 | | | | | | | | | | Fish Epoch |
| | | | | | | | | | | | | |
| Early Paleozoic | Silurian | 410 | Caledonian Movement | Caledonian | Amalgamation of Yangzi Paleoplate | Marine invertebrate epoch | Organism blast Anoxic-event | Spore Epoch | Continent Vascular plant | | | |
| | Ordovician | 438 | | | | | | | | From rift to formation of Paleo -Asian continent | With Cathaysian Paleoplate | Grapertolite flourishing |
| | | | | | | | | | | | | |
| Neoproterozoic | Cambrian | 490 | Chengjiang Movement | Jinning | Crust solidified | Sponge appeared | | | | | | |
| | Sinian | 543 | | | | | | | | From rift to formation of Paleoproterozoic -Asian continent | Rift-volcanism event | |
| | | | | | | | | | | | | |
| | Nanhua | 680 | | | | | | | | From ocean to formation of Rodinian Continent | Rodinia Rift-volcanism event | Legena appeared |
| | | | | | | | | | | | | |
| Neoproterozoic | | 800 | Jinning Orogeny | | Collision of Paleoplates, Rodinian Supercontinent forming | | | | | | | |
| | | 850± | | | | | | | | | | |
| Neoproterozoic | | 100 | | | Ancient South China Ocean and Huaiyu Island arc | | | | Higher algae appeared | | | |

At a higher resolution, the fracture pattern within the granite block also had an important influence on the formation of Sanqingshan's distinctive landscape. The nominated property displays three sets of vertical joints, NE-SW, NW-SE and sublatitudinal (Fig.2.3). The NW-SE faults were influenced by earlier NNE-SSW strike-slip faulting, which rotated them to form a fan-like pattern with fractures converging towards the southwest and diverging in the northeast. The joints are of extension or extension-shear character, widely distributed, but with deep penetration into the granite. They occur in belts. There are also subordinate horizontal joints, which together with the strong vertical jointing, are the reason why erosion has sculpted such fascinating tower-like and figure-like landforms.

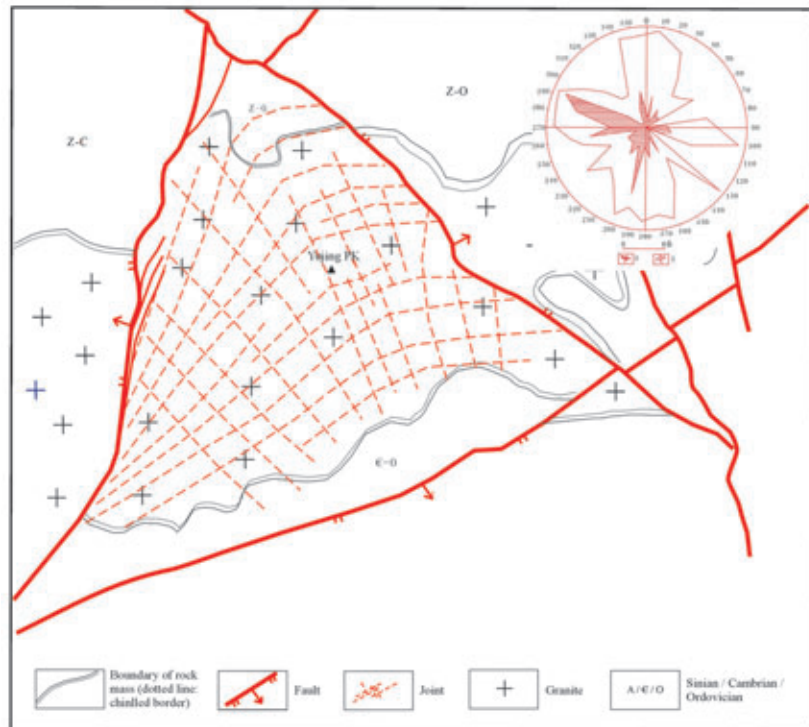


Fig. 2.3 Distribution of major faults and joints in the Mount Sanqingshan area (after Yin Guosheng, 2006)

1 billion years of geological history

The nominated property and its surroundings contain a continuous stratigraphical record from the Proterozoic to the Quaternary (Table 2.1). The geology of the area holds evidence of a significant part of the Earth's history, extending over a period of nearly 1 billion years. The oldest stratum is the Zhangcun Group of the Middle Proterozoic. This Group outcrops to the northwest of the nomination area and has been dated by the isochron radiometric method to provide a date of 1113 ± 53 Ma. (Ma Changxin). The geological history of the nominated property is described in Section 2.b.

Multiphase and multigenesis granitic sequence

The remarkable Suzhou-Dexing supercrustal fracture zone within which Mt Sanqingshan and its granite sequence is located contains clear evidence that the emplacement of granitic magma bodies was active from the Middle Neoproterozoic. However, the main period of granite emplacement falls into the Late Mesozoic (Yanshanian Movement) Epoch, with the youngest granitoid is represented by the Sanqingshan granite. The different granites in the area make up a granite sequence. (Table 2.2).

The oldest granitoid is an 'M' type oceanic plagiogranite about 968 ± 23 Ma. now found in metamorphosed peridotite at Xiwan (Fig. 2.4 color code 17 and letter M). Next oldest is the mid-late Jurassic granodiorite porphyry outcropping in the Tongchang-Yingshan tectonic-magmatic belt (marked by colour code 15 and letter I in Fig.2.4) This is located on the hanging wall of the paleoplate suture zone, and is an I type granite

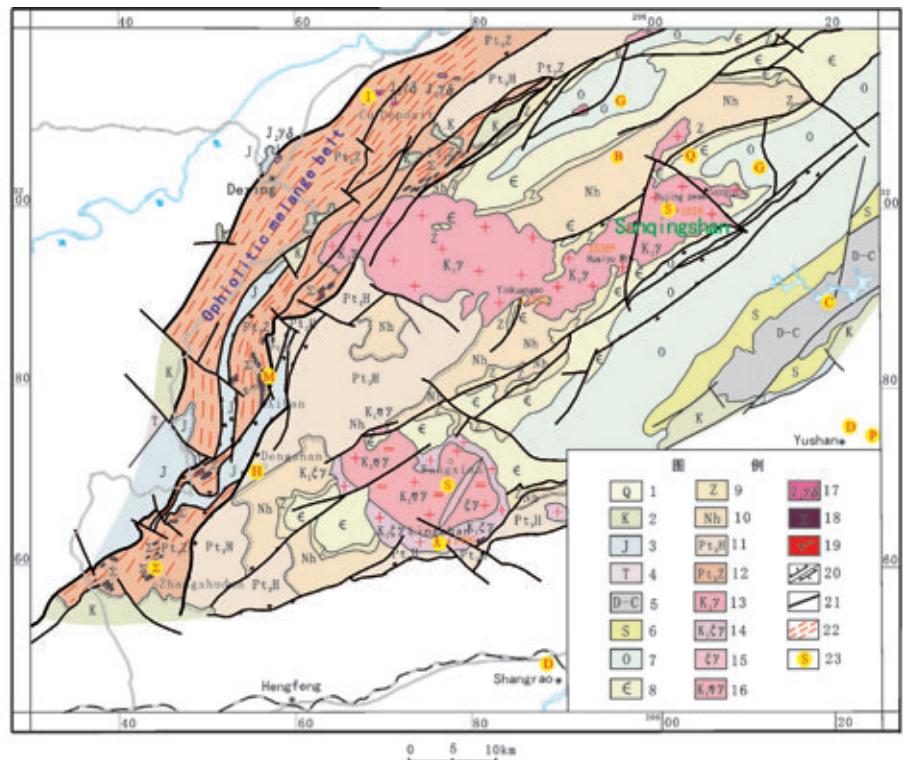
that originated from a mixed magma of lower crust and upper mantle.

Table 2.2 Main granite bodies in the Mount Sanqingshan area

| Time | Name of granite body | Rock type | Tec-Mag Belt | Gen.type | Occurrence | Isotope dating |
|-------------------|----------------------|--|----------------------|----------------|--------------|-----------------|
| Early Cretaceous | Sanqingshan | Fine grained porphyroid biotite moyite (supl.) | Lingshan-Sanqingshan | A ₂ | Stock | 115.6Ma.* |
| | | Medium grained porphyroid biot. moyite (supl.) | | | batholith | 123Ma.* |
| | Lingshan | Miarolitic amphyb. biot. alkali felds. granite | | A | Bathol stock | K — Ar115.6 |
| | Wangxian | Rapakivi amphybol- biot.adamellite | | S | Bathol | K — Ar140 |
| Mid-Late Jurassic | Tongchang | granodiorite | Tongchang-Yingshan | I | Stock boss | Rb-Sr isoch 170 |
| Mid-Late Prot | Xiwan | Oceanic plagiogranite | | M | Block | SHRIMP 968 ± 23 |

* Dated by U-Pb method on Zircon using IMMS, National Laboratory of Isotope Geology, 2006

The granites in the southern Sanqingshan -Lingshan belt stretching along the lower wall (southeast side) of the fracture zone are of Cretaceous age. In origin they are of the S genetic type granite that resulted from crustal remelting during the Yanshanian Orogeny and A type that formed under an extensional tectonic regime in the post-orogenic period. They included two bodies - the Lingshan and Sanqingshan batholiths - although geophysical data suggests that these batholiths are connected at depth. It is this granite body that forms the resistant core of the Huaiyu mountain range and determines its distinctive landscape character.



- 1.Quaternary System 2.Cretaceous System 3.Jurassic System 4.Triassic System 5.Devonian-Carboniferous System 6.Silurian System 7.Ordoevician System 8.Cambrian System 9.Sinian System 10.Nanhua System 11.Neoproterozoic Heshangzhen group 12.Middle Proterozoic Zhangcun group 13.Early Cretaceous porphyroid moyite 14.Early Cretaceous porphyroid moyite 15.Early Cretaceous miarolitic alkali-feldspar granite vein 16.Early Cretaceous ring-porphyrific adamellite 17.Middle Jurassic granodioritic porphyry 18.Middle-Neoproterozoic ophiolite 19.Middle-Neoproterozoic oceanic plagio-granite 20.Normal Fault 21.Deep Fault 22.Mylonitization/Schistositization
- 23.Geological remains:
 ● Lingshan A-type granite ● Sanqingshan S-type granite ● Tongchang I-type granite ● Zhangshudun ophiolitic melange ● Xiwan ophiolitic melange, Oceanic plagio-granite, Glauco-phane schist ● Dengshan rift-type volcanic rock ● Nanhua tillite ● Early Cambrian anoxic event ● Ordovician graptolitic fossil ● Jurassic silicified wood ● Carbonate karst landscape ● Late Cretaceous dinosaur eggs

Fig. 2.4 Geologic Map of Sanqingshan's surroundings with major geologic heritages

The Lingshan complex of early Cretaceous age outcrops in oval form. At the middle of the outcrop the Wangxian rock mass is an S type rapakivi granite - strictly a glomeroporphyritic rapakivi amphibole-biotite adamellite, containing plenty of microlite diorite inclusions of mixed origin (marked by colour code 14 and the letter S on Fig.2.4), has been dated as 140Ma. using the K-Ar method. Around this earlier-formed rock mass was intruded an A type amphibole-biotite-alkali feldspar granite (Lingshan granite mass, marked by colour code 12 and letter A on Fig.2.4), or biotite-alkali feldspar granite, with miarolitic structure, that evolved with a sodium rich tendency (Na_2O 3.7%) (Jiang Yaohui et al., 1999). It was intruded in a permissive way along the residual conduit of the earlier Wangxian rock mass. The A type mariolitic granite is dated 115.6 Ma. (K-Ar). The inner Wangxian rock mass has eroded to produce a gentle relief, while the granite in the outer ring has eroded into a peak forest landscape.

The main body of the Sanqingshan granite batholith is an A type, medium-coarse grained, porphyroid biotite-moyite (marked by colour code 11 and letter A in Fig.2.4). It is ultra acidic (SiO_2 - 77%) and alkali rich, with high potassium (K_2O -4.7%) and low calcium (CaO - 0.5%) content. It has a lower alkalinity and evolved with a greater potassium-rich tendency than the Lingshan rock mass (Yang Minggui, 2004). The Sanqingshan granite emplacement was related to the composite NNE and NW fault systems, constrained by strike-slip and extension processes in the post orogenic environment. The isotope dating of Sanqingshan multiphase granite is of 123Ma.-115.6 Ma., giving it an Early Cretaceous age. The estimated emplacement depth of the granite body is 4000m-4500m.

The nominated property is located at the eastern end of the Sanqingshan batholith (Fig. 2.4). The Sanqingshan granite was intruded in several distinct phases. During the main intrusive phase a medium-coarse grained, porphyroidal, moyite created a large magma body with an isotope age of 123Ma. (U-Pb on Zircon using IMMS). Then in a supplementary phase the last member of the emplacement was a medium-fine grained porphyroidal moyite. The latter formed a stock which is represented today by Peak Yujing and the summit area of Mount Sanqingshan, and is dated 115.6Ma. (U-Pb method on Zircon, IMMS). This later phase has been dated 115.6 Ma., and is the last event of the Sanqingshan granite field. Further analysis of the rock body of the main phase has enabled three facies to be recognised: a border facies of fine grained porphyroid moyite, a transitional facies of medium to medium-coarse grained porphyroid moyite, and a central facies exposed along the valleys of coarse grained moyite. Interestingly the surface of the granite batholith is littered with residual wall rocks, suggesting that stripping of the strata that overlay the granite is still quite young.

2.a-3 Significant Geological Features

Neoproterozoic ‘continent-continent’ collision

The ophiolite, oceanic plagiogranite and glaucophane schist provide evidence of the existence and closure of the Mid-Neoproterozoic South China Ocean and the ‘continent-continent’ collision between Yangzi and Cathaysia Plates. The ophiolite rocks are well exposed at Xiwan of Dexing City (marked by colour code 10 in Fig.2.4) and associated with glaucophane schist and the oceanic plagiogranite in which they are shown to lie in the southwest section of the Xixian-Dexing Ophiolitic Melange Belt, and represented by the Middle-Neoproterozoic Zhangcun group (marked by color code 10 in Fig. 2.4). The ophiolite occurs in the form of

lenses or blocks in contact with the wall rocks of the suture, while the melange accumulation is a mix of ophiolite and strongly deformed phyllite-like rocks.

The ophiolite melange is one of the very few Proterozoic ophiolite melanges known in China. While the complete history of the ocean crust is not known because most was destroyed in the subduction and collision, evidence held in the larger ophiolite blocks has made it possible to at least restore the succession of the ophiolite suite. This consists of iherzolite, harzburgite, dunite-wehrlite, gabbro-trachybasalt, basaltic lava, diabase dyke-tuff, greywacke, turbidite and silicalite. This succession typifies an ocean crust suite and confirms the closure of the South China Sea by collision of the Yangzi and Cathaysia continental plates. The amphibole from the ophiolite suite has been dated 901.2 ± 19.6 Ma. (Ar/Ar isotope method, Xu Bei, 1992).

To the southwest of the nominated property, within the Xiwan melange accumulation, are outcrops of Middle Neoproterozoic oceanic plagiogranite (marked by colour code 17 in Fig.2.4). Here also to be found are high pressure metamorphic rocks (low temperature and high pressure belt), consisting of glauciphane schist and jadeite albitite, lying in the Xiwan metamorphosed peridotite. Dated as 866Ma., these rocks provide evidence of the ‘continent-continent’ collision, and the Jinnin Orogeny in the Chinese continent.

Late Neoproterozoic volcanism and rifting

While the ophiolites and glaucophane schist provide evidence of the collision and amalgamation of the Yangzi and Cathaysia paleo-plates to form the Rodinia supercontinent, late Neoproterozoic volcanic deposits signify continental break-up through rifting. The volcanic rocks are best seen at Dengshan, to the west of the nominated property (marked with letter H in Fig.2.4), where the Heshangzheng formation contains good sections exposing bimodal basalts and rhyolites. These lavas have been dated to 817.6 Ma. (Rb-Sr isochron) or 807 Ma. (SHRIMP), indicating that the rifting and break-up of Rodinia occurred 820-800 Ma..

Nanhua glacial deposits

Tillites and other deposits from the Late Neoproterozoic Nanhua (or Cryniogenian) global glacial event are present in the north of the nominated property (marked with the letter B in Fig.2.4). At this time the nominated property was located at the margin of a shallow neritic sea, but enclosed by glaciers. Large quantities of icebergs and ice rafts floated across this ocean to deposit a tillite comprising gravel-bearing sedimentary tuffs, sandstone and shale, intercalated with interglacial grey-black carbonaceous shale and limestone. The gravel varies in size, with clasts ranging up to 40cm in diameter. Glacial striae are also observed. The Nanhua period of the Neoproterozoic is thought to hold evidence from across the planet that the Earth was gripped by extreme glaciations, giving rise to the term ‘Snow Ball Earth’.

Early Cambrian anoxic event

Black shale of the early Cambrian Hetang Formation (marked by letter Q in Fig.2.4; symbol \otimes 1 h-d in Fig. 2.2) outcropping in the north of the nominated property holds evidence of the Cambrian anoxic event. The lower deposits of the shale have layers and lenses of coal, these containing nodules of pyrites and phosphorous, the latter being rich in vanadium, uranium and other elements. The deposit is important because it records

the rapid evolution of life forms in the early Cambrian period in South China when primitive organisms, such as Thaldophyta, multiplied rapidly, only to die during the anoxic event when they accumulated on the sea floor, eventually to be lithified into coal. After the anoxic event, in the explosion of life that occurred in the late stage of the early Cambrian, trilobites (*Agnostus*) and brachiopods flourished in large numbers.

Ordovician graptolite community

In the northeast of the nominated property are early-middle Ordovician shales that are rich in fossil graptolites (marked by the colour code 5 and letter G in Fig.2.4). This fossil assemblage is of regional importance because the graptolites have a clear evolutionary trend and stratigraphical zoning, which has enabled 17 continuous successions to be identified. The site has also provided a new genus - the Jiangnan graptolite genus, while the stratigraphic section at Chenjiawu has been designated a key reference section by the International Palaeontological Society. The graptolite assemblage has a typical transitional character, representing strata that formed in the marginal zone of a tectonically active basin. The strata containing the graptolites are a thin set of black shale, calcareous shale and silicalite beds. The fossils are mainly Pacific factors, with minor typical Atlantic factors. In total these beds contain 51 genera and 247 species and subspecies, and of these 1 genus and 21 species, belonging to 21 families have been newly discovered from the site.

Intracontinental subduction

The formation of the granite field of Mount Sanqingshan was closely associated with the tectonism that formed the Suzhou-Dexing Supercrustal Fracture Zone. The Zone originated as a NE-SW trending Neoproterozoic collision zone and was further subjected to the 'A' type subduction of the Yanshanian Epoch. At the start of the Yanshanian, in the middle-late Jurassic Period, the subduction related Tongchang-Yinshan I type intermediate-acid porphyry belt formed on the leading edge of the fault zone (marked by letter I in Fig.2.4). In the later Yanshanian, the back edge of the subduction zone was uplifted under a regional left lateral strike-slip stress and magma was intruded under an extensional regime to form the Sanqingshan-Lingshan hypogene granitic belt. This first phase of this intrusion, which took place in the early stage of the Early Cretaceous, emplaced the S type glomeroporphyritic rapakivi amphibole-biotite adamellite and formed the interior part of the Lingshan Complex (marked as colour code 14 and the letter S in Fig.1.5). Soon after this, in the later stages of the early Cretaceous, the Lingshan A type miarolitic alkali feldspar granite (marked as colour code 12 and letter A₁ in Fig.2.4) and the Sanqingshan A type moyite body (marked as colour code 11 and letter A₂ in Fig.2.4) were intruded. The I type granite of the Sanqingshan granite field came from a deep source.

2.a-4 Significant Geomorphological Features

Mount Sanqingshan is a tectonically uplifted rigid block of hard Yanshanian ultra-acidic, highly silicic granite. It is the massive nature of this rock mass, together with its fracture system, that provides the principal controls on the geomorphology and landscape of the mountain. At the surface the exposed faults and joints that cut the mountain have been exploited by runoff and percolating water. Over time, weathering, collapse and fluvial erosion along the lines and faces of exposed fractures have shaped Sanqingshan's landforms, from the major valleys and deep gorges, to the peak forests and pictographic stones.

Gorges and valleys

Mt Sanqingshan is cut by a large number of deep gorges and bounded by major fault-guided valleys. There are 23 main gorges distributed above 500m of elevation, with lengths of several thousand meters. Typically these gorges have steep, flat walls that form cliffs from tens to hundreds of meters in height. The deep and narrow gorges mostly have a V-shaped profile.

The gorges empty into large valleys formed along the lines of the three normal faults that bound Mt Sanqingshan (i.e. that have given rise to the triangular-shaped uplifted mountain block). These valleys follow the Fenling-Zihu Fault Zone, Xiaoken-Bajiaowu Fault and Egongling-Xiaxiken Fault (Fig.2.2).

The Fenlin-Zihu fault valley is located in the southeast of the property and consists of several NE50°-60° trending faults that dip to the southeast at 60°. Of these the Fenlin-Dalongkou fault shows a clear upthrow to the NW and downthrow to the SE. Along this fault may be observed the cleavage and schistose zones indicative of early stage shearing, together with a later-formed fault breccia zone. The fault zone is 10-40m wide and was apparently subjected to several stages of downcutting. Today the valley contains long, straight gully sections, occasionally with sharp corners where the channel has been laterally displaced.

The Egongling-Xiaxiken fault valley is located in the east and northeast of the property, where it strikes NW-SE and dips to the NE at 65°-70°. Upthrow was to the SW, downthrow to the NE. The fault plane exhibits schistose granite, tectonic breccias, intensive silicification, mineral recrystallization and quartz druse and agate. A large dimension gully has been eroded along this fault and in the southeast part there is a discontinuous fault cliff formed of silicified rocks (photo 2.1).

The Xiaoken-Bajiaowu fault valley is located in the northwest of the nominated property, trending NNE-SSW and dipping to the NW at 70°. The fault cuts off a NE trending fault that enters the property from the SW. The upthrow side of this fault is to the ESE, with downthrow to the WNW. Tectonic breccias, silicified rocks, and cataclastites are to be found along the fault, while long stretches have been eroded into a deep gully.



Photos 2.1 Xiaoxiken Fault Valley



Granite landforms

The nominated property has one of the World's most spectacular and important granite landscapes, comprising an outstanding assemblage of landforms at varying scales. The landscape type is one known in China as 'Peak Forest' (literally, forest of stone peaks), and its outstanding feature are the abundance, diversity and high quality of the landforms. Particularly notable are the high concentration of these forms on Mt Sanqingshan and the presence of remarkably sculptured rocks.

The landforms are of nine different types, known as: overlapped peaks, peak wall, peak cluster, stone forest, peak pillar, rock cliff, gorge and pictographic stone (these last are naturally sculpted rocks, each having the shape of a recognisable feature, usually animal or human). This diverse range of features makes Sanqingshan an exceptionally important place in which to study the evolution of these unique granite landforms. The central scenic area of 2,800 ha includes 48 individual peaks, 89 pictographic stones, and 361 individual landforms of note. The pictographic stones are particularly remarkable and life-like, there is nothing quite like them anywhere else in the world. Two of the most acclaimed figurative examples are the 'Oriental Goddess' and the 'Gigantic Boa', celebrated as natural wonders throughout China.

The reasons for the occurrence of such well-formed and well-preserved geomorphic landforms on Mount Sanqingshan are as follows:

1. The occurrence of massive, hard granitic rock as a material base;
2. The unique geological structure of the area, in which a fault-bounded triangular block of granite was uplifted above, and as a part of, a larger regional uplift (i.e., 'uplift on uplift');
3. The rate of uplift outpacing denudation;
4. Crustal extension that produced deep vertical joints that are 'rare, large, long and deep' lying in a fan-shaped arrangement (Fig. 2.2), dividing the granite mass into blocks, thick plates and prisms which favoured erosional dissection and the formation of landforms;
5. A geographical location in East China that receives substantial seasonal rainfall in a warm climate, enabling effective weathering of the granite, along with sheet and linear scouring of surfaces and deep valley erosion;
6. Gravity collapse and the impact of the vegetation (acidification of soil water, physical weathering by tree roots, ect);
7. Other conditions that have been highly suitable for the preservation and enhancement of the landforms include: uplift of the mountain body, supporting progressive landform renewal through slow erosion, relatively weak chemical weathering and rapid removal of weathered products, a low degree of rounding of the relief, and the limited presence of Quaternary deposits masking rock surfaces. Of further significance, human damage in the site has been minimal.

Evidence of the processes and stages of the formation of the landforms is extremely well-preserved, which has enabled the construction of a typomorphology. The main landform types are described in Table 2.3, and the most notable six types are described below.



Table 2.3 Granite landforms of Mount Sanqingshan, main types and typomorphic examples

| Type | Example name | Example location | Characteristics |
|------------------|-------------------------------|--------------------------------------|--|
| Overlapped peaks | Three ancestors of Taoism | 118° 03' 52.3" E, 28° 4' 57.5" N | Three large pyramid peaks: Peak Yujing as the major peak with elevation 1,816.9m, Peak Yuxu close to N side of Peak Yujing w/elevation 1,776m, Peak Yuhua lined to Peak Yuxu w/elevation 1,752m. Three peaks rising up to cloud to form pyramid like overlapped summit, just like three ancestors of Taoism: Yuqing, Shangqing and Taiqing. |
| Peak wall | Great Wall in heaven | 118° 03' 12.6" E, 28° 54' 46.4" N | To the north of Gangwan, Xihai, the peak wall looks like Chinese Great Wall, extending in 200°-205°100m long, and 15m thick, 60m high, vertical, w/flat surface, the peak wall is a well preserved granite landform, hence the name. |
| | Wanhu chaotian | 118° 03' 50.5" E, 28° 54' 28.6" N | With elevation 1,350 m, height difference 200m made up of seven vertical peak pillars, which like jade "Hu"(tablets) held before the breast of officials when received in audience by the emperor, hence the name. It formed, as granite body cut by EW and NS vertical joints, further subjected to weathering, denuding and scouring. It is the typical example for a peak wall evolving into a peak pillar. |
| Peak cluster | Peak cluster at Heavenly Gate | 118° 03' 41.2" E, 28° 54' 11.5" N | The cluster of lined peaks striking in NS direction at summit of Tiyunling, connected at bottom and spire-shaped at top, with diameter at bottom 5m-40m, height 20m-100m. Viewed from Reshang Mountain Cottage, like bamboos after spring rain, rugged and slender. The two main peaks in centre, uprising to touch cloud, like a gigantic gate, hence the name. |
| Stone forest | Yuling Stone Forest | | Located to southeast of Yuling Nunnery, composed of small prism-shaped pillar peaks which are 10m-20m high, w/diam. 8m-12m, tall, straight and majestic. Rock body cut by EW and NS vertical joints, further subjected to weathering, denudation and scouring to form the landform. |
| Peak pillar | Oriental Goddess | 118° 03' 58.3" E, 28° 54' 30.8" N | At elevation 1,182m, rising to 86m, the peak is typomorphic for Yanshan granite, cut by two sets vertical joint into pillar peak, further subjected to horizontal joint cutting and collapse to form two sections, still further subjected to weathering and denudation to form a figure of goddess, remarkably true to life. |
| | Gigant Boa | 118° 03' 51.2" E, 28° 54' 51.2" N | Elevation 1,200m, height 128m, diameter 7m-10m, it is typomorphic for granite, cut by joints to form NS strike peak wall, then cut by EW joints to form peak pillar—"Boa's body", further subjected to scouring, collapsing, and weak weathering and denuding to form "Boa's head". |
| | Guanyin admiring moon | 118° 03' 51.4" E, 28° 54' 19.2" N | Located 50m northwest of Yu Emperor's summit. Upper part 15m high, resembling Guanyin Buddha, lower part 50m high, w/diam. at bottom 20m, diam. at top 8m. Peak pillar was formed, when granite cut by two sets of vertical joints; then it was subjected by horizontal joint cutting, and weathering, denudation and collapse. To form pictographic stone. |



Photo2.2 Overlapped Peaks

【 Overlapped Peaks 】 (Photo 2.2). This term denotes a cluster of giant peaks, such as the ‘Three Ancestors of Taoism’ which has individual towers with a vertical range of up to 1,000m. The granite peaks formed by erosional dissection of the rapidly uplifted mountain block.



Photo 2.3 Peak wall

【 Peak wall 】 (Photos 2.3, 2.4). This feature has the appearance of a tall stone wall (i.e., with two parallel faces and an even thickness top and bottom). Typomorphic examples are the ‘Great Wall in Heaven’, ‘Double Wall at Xihai’, or the finger-like peak wall pillars such as ‘Wanhuchaotian’ and ‘Jujie Stone’.





Photo 2.4 Peak wall



Photo 2.5 Peak Cluster or Peak Forest

[Peak Cluster or Peak Forest] (Photo 2.5). This is a cluster of smaller peaks or spires all connected to one another at the base. While the cluster of spires indicates dissection at one level, the base is not usually dissected and may represent a new erosion surface provided by uplift and associated downcutting of the bounding gorges. Typomorphic examples are ‘Peak Cluster at Heavenly Gate’ and ‘Peak Cluster at Qiong Platform’.

【 Stone Forest 】 (Photo 2.6). A stone forest is a cluster of small-scale prism-like peak pillars, looking more like traditional ‘tors’. An example is the ‘Yuling Stone Forest’ in the northeast of the nominated property.

【 Peak Pillar 】 (Photos 2.7& 2.8). This is a single column of granite, usually isolated by deep clefts and gorges. Peak pillars range from 10m to over 100m tall, perhaps the most spectacular and celebrated being the 128m high ‘Gigantic Boa’. They vary from tabular to prismatic columns, although some have a broader, rounded form (e.g., ‘Oriental Goddess’ and ‘Guangyin enjoys Music’).

【 Stone Cone 】 (Photos 2.9& 2.10). This feature is a pillar with a rounded body that tapers towards the top, although there is great variety of shape and height (usually less than 5m). Examples are ‘Penguin Stone’, ‘Double Breast’ and ‘Rhinoceros Stone’.

【 Pictographic Stones 】 (Photos 2.11, 2.12 & 2.13). On the overlapped peaks, peak clusters, peak walls and peak pillars, weathering, erosional scouring and uneven collapse have sculptured the rocks into wonderfully figure-like shapes. These may be genetically sub-divided into: a) scarcely distributed figure-like stones principally resulting from spheroidal weathering, such as the ball-like ‘Bottle Gourd Stone’ or ‘Celestial Turtle Searching in Sea’; b) a series of other pictographic stones resulting from a variety of erosion processes: cusped stones such as ‘Celestial Fingers’, ‘Fairy and Shoes’, ‘Rhinoceros Stone’, ‘Crane Peak’ and ‘Snail’, and some features of individual form, such as ‘Fox Gnawing a Chicken’, ‘Gehong Making Pills



Photo 2.6 Stone Forest



Photo 2.7 Granite peak pillar (Xiu Peak)



Photo 2.9 Granite stone cone (Snail Playing with Pine)



Photo 2.10 Granite stone cone
(Celestial showing a finger)



Photo 2.8 Granite peak pillar (Gigantic Boa)



Photo 2.11 Globular stone of granite (Bottle Gourd)

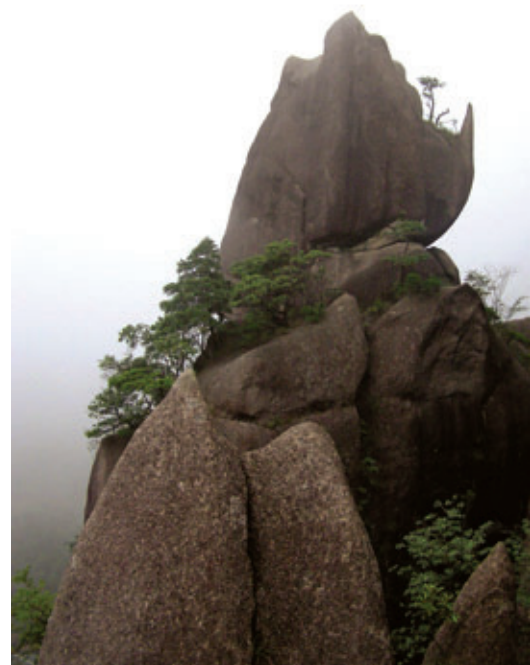


Photo 2.12 Cusped granite (Rhynceros)



Photo 2.13 Cuspate granite



Photo 2.14 Karst and natural bridge

of Immortality', 'Leopard Cat Waiting for Mouse' and 'Zhuangzi Teaching Taoism'.

Karst and caves

The area of the Sanqing Lake in the south of the nominated property is a structural zone of Carboniferous carbonate rocks and the most important area of karst landscape in Jiangxi Province. The karst here displays a comprehensive set of typical landforms, which are well-developed. Controlled by NW-SE trending fracture zones, the landscape has both important surface and underground components. On the surface may be found a 4,000m² karst lake, solutional and collapse dolines (the largest, most typical in form and best preserved in Jiangxi Province), natural bridges, karren, pavements and 'stone teeth', peak cluster, blind valleys, uvalas and gorges and numerous pictographic stones. Beneath the surface, cave systems are well-developed with many carrying active rivers fed by surface runoff. Over 50 cave entrances are known (Photo 2.14), while many

caves hold important clastic, chemical and alluvial deposits.

Waterfalls, ponds and springs

The abundant seasonal rainfall and runoff provides Mt Sanqingshan with many impressive waterfalls (Table 2.12). The eight most important waterfalls lie mostly at the lower and middle parts of the mountain, between the 500m and 1,000m contours. Waterfalls with a fall of 10m-30m and a width of several to tens of metres have three characteristic features: a 'stone gate' at the top through which the water plunges, a hanging wall, and a pond, usually full of blue-green water, at the bottom. Two types of falls are present: those formed where water passes over a cliff formed when rock has fallen away from one side of a fault or joint, and those formed due to erosional back-cutting of the headwall. Examples of impressive waterfalls are Longtan Waterfall at Baji, Yulian Waterfall, Shijian Waterfall and Bingyudong Waterfall.

Lakes and ponds on Mt Sanqingshan are mostly associated with active streams and waterfalls. Although their waters are pure, they usually appear bluish green. They each occupy an area tens of m², may be several metres deep, and were formed by fluvial scouring at the intersections of faults and/or joints. Examples are Shigu Pond, Yunu Pond and Wucebiyu Pond.

As groundwater is stored in the myriad of joints and faults that cut the mountain, there are many springs on all sides of the mountain. Some of the larger springs are Gudan Well, Luquan Well, Yuan Spring and Yumen Spring.

2.a-5 Biology

Based on the Udvardy Classification System, the organisms in the Nominated Property belong to the China Subtropical Forest Province of the Palearctic Realm. Mount Sanqingshan boasts a particular high biodiversity. Identified so far in the property are 2,373 species of higher plant (including sub-species, the same below) and 401 species of vertebrate. In addition, 45 species are listed in the IUCN Species Red List, 146 species are listed in CITES APPENDIX I, II, III (1995), 144 species of animal and plant are listed in the China Species Red List, and 79 species are designated as National Key Protection wild animals and plants in China (Table 2.4). 68 genera of spermatophytes are of East-Asia and North America disjunct distribution character, most of them being geographic relics.

Table 2.4 Known species of rare and endangered animal and plant in the nominated property

| Organism | IUCN Red List | CITES Species | China Red List | National Key Protected Species |
|----------|---------------|---------------|----------------|--------------------------------|
| Plant | 22 | 92 | 49 | 26 |
| Animal | 23 | 54 | 95 | 53 |

2.a-5-1 Flora

Mount Sanqingshan is located in the eastern area of China, belonging to the Sino-Japanese flora domain of the East Asia flora zone. The Vegetation type of Mount Sanqingshan is diverse and shows a typical mountain vegetation character, belonging to the type of middle mountain humid evergreen broad leaved forest in the east of China mid-subtropic zone. There are 2,373 species (including subspecies) of higher plants, which belong to 984 genera of 253 families. Among these species, there are 368 species of Bryophyta from 165 genera of 65 families; 179 species of Pteridophyta from 71 genera of 34 families; 24 species of Gymnospermae from 22 genera of 6 families, and 1802 species of Angiospermae from 726 genera of 148 families (as shown in Table 2.5). Accordingly, this region not only harbours some of the most abundant plant species growing in the middle subtropical evergreen broad leaved forest in China, but it is also the world distribution centre for *Pseudotsuga* genus of the Pinaceae family, in particular, *Pseudotsuga gaussenii*. Many kinds of fungi and lichens in Mount Sanqingshan are also well-represented in the ecosystem.

Table 2.5 Higher plants in the nominated property

| Taxa | Family | Genera | Species |
|--------------|--------|--------|---------|
| Bryophyta | 65 | 165 | 368 |
| Pteridophyta | 34 | 71 | 179 |
| Gymnospermae | 6 | 22 | 24 |
| Angiospermae | 148 | 726 | 1802 |

Vegetation types and vertical zonation

There are 9 vegetation types in Mount Sanqingshan, including evergreen broad-leaved forest, warm temperate coniferous forest, warm temperate needle and broad-leaved mixed forest, bamboo forest, warm temperate coniferous forest, temperate needle and broad-leaved mixed forest, evergreen and deciduous broad-leaved mixed forest, coppice forest, and mountain top meadow coppice forest also called embryo-forest(Fig. 2.5).

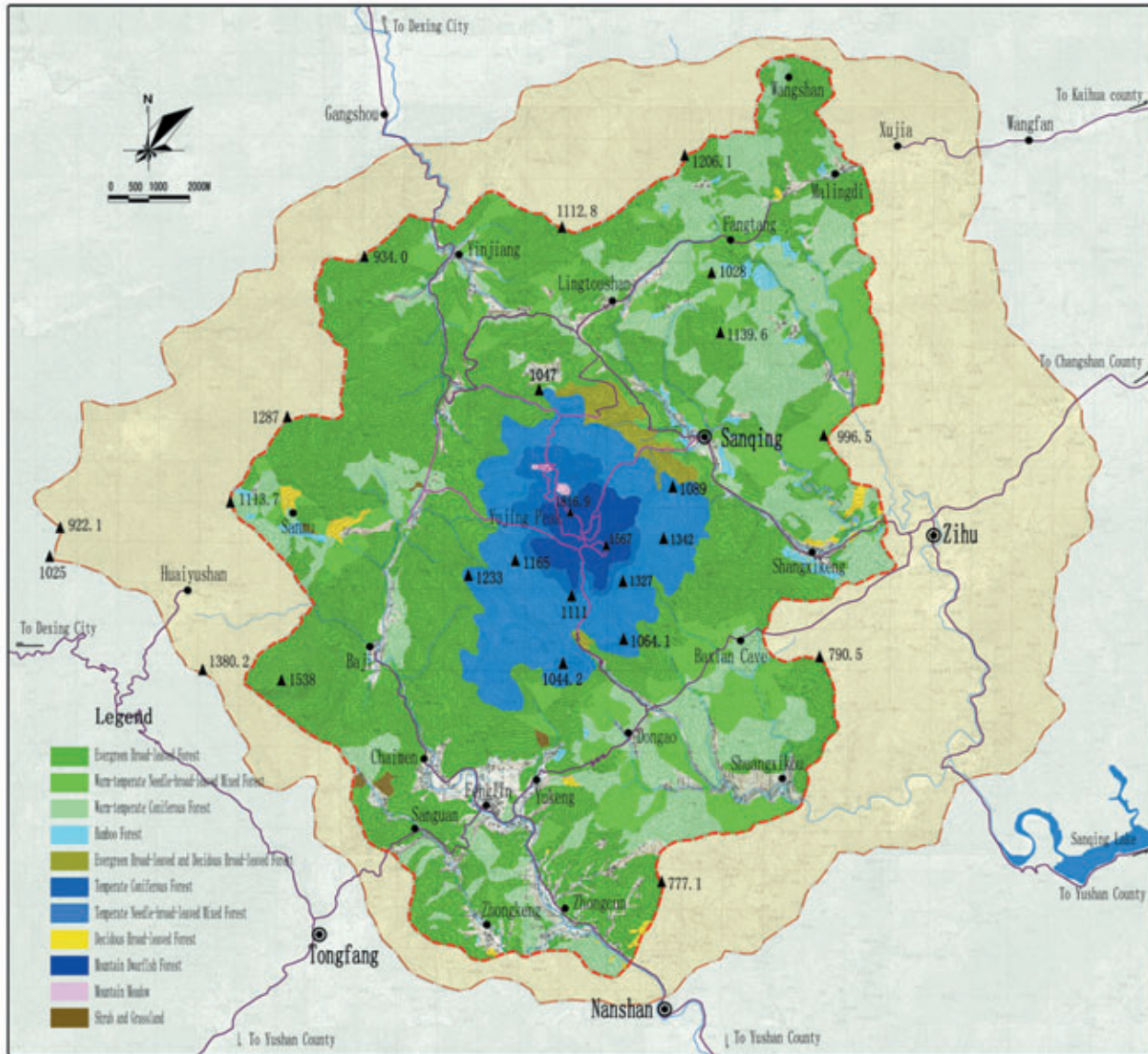


Fig. 2.5 Vegetation Map of Mount Sanqingshan Nominated Property

Evergreen broad-leaved forest is the typical vegetation type. It covers 11,304 ha., at an altitude of 300m-1,000m above sea level in the middle to lower part of the mountain. Dominant species are *Castanopsis sclerophylla*, *Castanopsis eyrei*, *Cyclobalanopsis glauca*, *Castanopsis tibetana*, *Schima superba*, *Machilus thunbergii* and *Machilus chinensis*. (Photo 2.15).

The warm temperate coniferous forest covers 4,279 ha. at an altitude of 200m-800m in the middle to lower part of the mountain. Dominant species are *Pinus massoniana*, *Cunninghamia lanceolata*.



Photo 2.15 Evergreen broad-leaved forest

The warm temperate coniferous/broad-leaved mixed forest covers 3,183 ha. at an altitude of 200m-1,000m in the middle to upper part of the mountain. It is located at the junction of evergreen broad-leaved forest and warm temperate coniferous forest. Typically this mixed forest is composed of *Pinus massoniana*, *Castanopsis sclerophylla*, *Alniphyllum fortunei*(200m-600m), *Liquidambar acalcina* (500m-1,000m) and *Sassafras tsumu*(Photo 2.16).

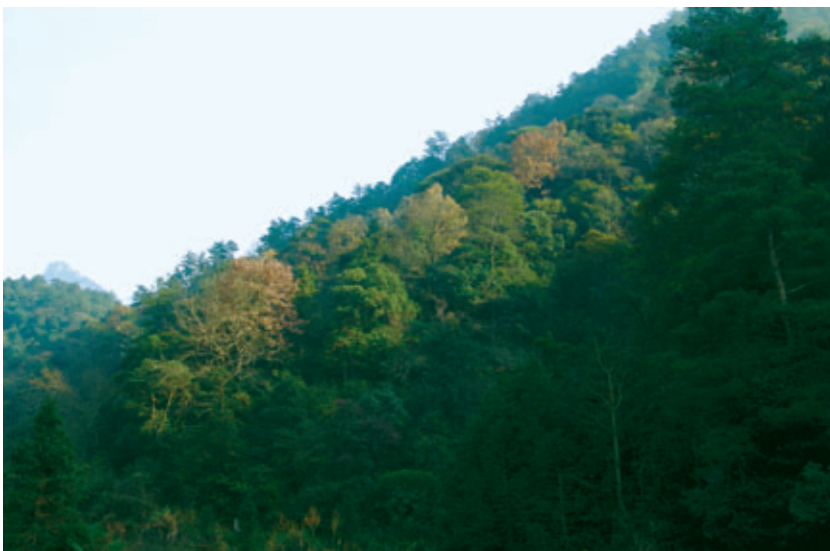


Photo 2.16 Coniferous and deciduous broad-leaved

The bamboo forest covers 246 ha. There are three Main constructive species: *Phyllostachys heterocycla* (altitude 200m-500m); *Indocalamus latifolius* (altitude 900m-1,100m); *Yushania hirticaulis* (altitude 1,200m-1,700m) on the upper part of the mountain.

The warm temperate coniferous forest covers 367 ha. at an altitude of 1,000m-1,700m at the upper to top part of the mountain. The virtually homogeneous constituent is *Pinus taiwanensis*. There are several near homogeneous *Pinus gaussenii* forests discontinuously distributed at an altitude of 1,300m-1,500m in the southern valley of the mountain. (Photos 2.17&2.18).



Photo 2.17 *Pinus taiwanensis* community



Photo 2.18 *Pseudotsuga gaussenii* community



Photo 2.19 Evergreen broad-leaved and deciduous

The temperate coniferous and broad-leaved mixed forest covers 2082 ha. at an altitude of 1000-1800m at the upper to top part of the mountain. There are many rare species in this zone, including *Rhododendron simiarum*, *Yuahania hirticaulis*, *Pinus taiwanensis*; *Pinus gaussenii* and *C.multinervis*; *Tsuga chinensis* var. *tchekiangensis* and *C.stewardiana*; *Pseudotaxus chienii* and *Eurya saxicola*; *Fokienia hodginsii*, *Daphniphyllum macropodum*, and *Halesia maegregorii*; *Torreya grandis* and *Symplocos theaefolia*(Photo 2.19, 2.20).



Photo 2.20 Coniferous broadleaved mixed forest

The evergreen broad-leaved and deciduous broad-leaved forest covers 254 ha. at an altitude of 700m-1,000m at the middle to upper part of the mountain. It is mixed with temperate needle and broad-leaved forest. Predominant species are: *Rhododendron simiarum* and *Eurya saxicola*, *Quercus spinosa* and *Rhododendron simiarum*; *Cyclobalanopsis Jenseniana*, *Cameia oleifera* and *stewartia simensis*; *Castanopsis eyrei*, *C. hnrnyi*, and *Cy. Jenseniana* (Photos 2.21&2.22)

The coppice forest covers 420 ha.. It is a very important type in conferring the characteristic aesthetics of the ecological landscape of Mount Sanqingshan. It is found at an altitude of 1,000m on the steep slope of the mountain. That is why it is also named “Coppice Forest on the Steep Slope”. The principal constituent species are *Pinus taiwanensis*, *Taxus chinensis*, *Juniperus formosana*, *Torreya grandis*, *Yusania hirticaulis*, *R. fortunei* and *Enkianthus Chinensis*.



Photo 2.21 Evergreen Coniferous and broad-leaved mixed forest

The mountain top meadow covers 15 ha. at an altitude of 1,500-1,600m, where the slope is relatively gentle and water is retained in the soil. The principal species here are *Scirpus whichurai* and *S. subcapitata* (Photo 2.23).



Photo 2.22 *Quercus spinosa* community



Photo 2.23 Mountain top meadow

Important biome distribution area

Mount Sanqingshan has 68 genera of plants found in the disjunct distribution zone across East Asia and North America, accounting for 56.2% of the genera of this kind in China (121 genera). It is one of the major preservation sites harboring these types of plant, including *Torreya* of the Taxaceae family, *Magnolia* of the Magnoliaceae family, and *Hamamelis* of the Hamamelidaceae family. These genera present in the disjunct distribution zone across East Asia and North America were once thought to originate from the old tropic zone (notably the Mid-Asia tropic mountain region), before the Tertiary Age in East Asia and South East Asia (Palaeocene and Eocene periods).

It has been pointed out (Lin Ying, 1986) that Jiangxi Province is an important originating centre for the Chinese flora forming part of the East Asia-North America flora system. Analysis of the flora of Mount Sanqingshan indicates that this area is the primary core of this flora in China and that the composition of the flora system corresponds to that found in the south-eastern and western parts of North America. This knowledge is important for the study of geology, palaeogeography and the evolution of palaeo-organisms on both continents.



Photo 2.24 *Pseudotsuga gaussenii* (CSRL 2004:VU)

Survival and distribution of *Pseudotsuga* and *Tsuga*

The Pinaceae family has the greatest variety of species, encompasses the most extensive distribution, and covers the largest area of natural needle-leaved forest among the gymnosperms. In this family, *Pseudotsuga* and *Tsuga* genera are typical members found in the East Asia-North America disjunct distribution zone. *Pseudotsuga* is a rare genus which can be divided into two groups containing six species and one variant (Li Nan, 1993; Farjon, 1990). Group Sect. *sina* contains five species of which four species are found in East Asia. The fifth species, *P. macrocarpa*, is found on the west coast of California. The whole group is a prominent representative of the disjunct distribution pattern across East Asia and North America. Although there are five

species in the group of Sect. *sina*, each species is only sparsely distributed in small numbers. Besides, it is difficult for these species to propagate by natural means, which is indicative of an extinction trait. The nominated property is the only place in the world where these species thrive over a wide area. On Mount Sanqingshan, *Pseudotsuga gaussenii* (Photo 2.24) is distributed in the region of coniferous and broadleaved mixed forest at an altitude of 600m-1,800m. Beyond any doubt the nominated area is the modern distribution center of *Pseudotsuga gaussenii*. It is most concentrated at 1,300m-1,500m, covering an area of about 533 ha, where the densest occurrence covers about 160 ha. in monoculture. These trees are 180-200 years old. *Pseudotsuga menziesii* shows very different characteristics. Although it has only one species and one variant (*P. menziesii* and *P. menziesii* var. *glauca*), it flourishes and propagates easily. It has been designated “an example of a plant species which is growing in the most suitable environment on the planet”. *Pseudotsuga menziesii* is the primary constituent of the temperate coniferous forest on the west coast of North America, again indicating the floristic kinship in geology and history between the two continents.

The genus *Tsuga* is the most evolved group of the Pinaceae, containing nine species and three variants. Of these, six species and three variants occur in East Asia. Apart from two species present in Japan, the rest are found in the mountain land south to the Qin Mountain in the subtropical zone in China. There are three species in North America distributed in the mountains of the west and east coast, but distribution of Sect. *Tsuga* has greatly reduced in both Asia and North America (Fig. 2.6).

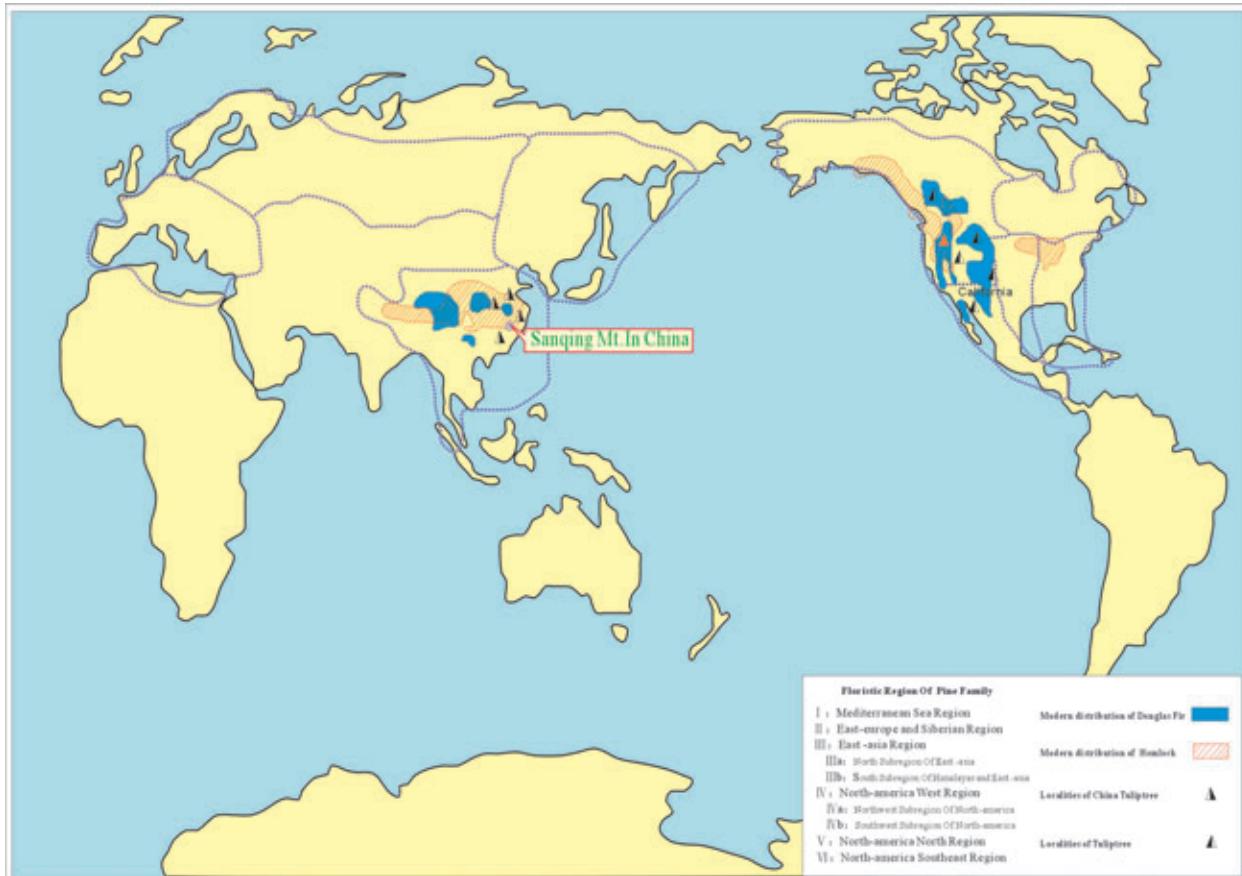


Fig.2.6 Present distribution of *Pseudotsuga*, *Tsuga* genera of Pinaceae
(after Li Nan)



Photo 2.25 *Ginkgo biloba* (IUCN RL 2003 :EN)

From the Late Cretaceous of the Mesozoic to Pliocene of the Cenozoic, the eastern part of Asia and the western part of North America were connected by the Bering Land Bridge. This existed at least until the Pliocene. The Bering Land Bridge made it possible for species in East Asia and in North America to exchange, resulting in the formation of the Circum-Pacific Flora. Among the extant genera of Pinaceae, *Pseudotsuga* and *Tsuga* were spread via this route. The ancient *Pseudotsuga* might have spread to the west of North America through the Bering Land Bridge before the Oligocene. With the influence of volcanic activity and orogeny in this region, changes might have occurred to the chromosomes of those species to cause them to evolve into Sect. *Pseudotsuga*, better adapted to the new environment. On the other hand, the original *Pseudotsuga* did not efficiently adjust to the new environmental conditions and began to diminish. Genus *Tsuga* might originate from the late Cretaceous to the early Palaeocene and could have been widely distributed in East Asia and then spread to the west side of North America in the early Oligocene. These cases indicate that the development, expansion and current distribution of the genera *Pseudotsuga* and *Tsuga* are closely related to the changes in geological history. The nominated property, Mount Sanqingshan, is the dispersal centre for *Pseudotsuga gaussenii* and *Tsuga chinensis* var. *tchekiangensis*. It is an important site for the study of the development of *Pseudotsuga* and *Tsuga* generally.

Biotic Refuge during the Ice Age

In the Quaternary Ice Age, the temperature on earth was low and most of the hylophyte were destroyed. However, the vegetation on Mount Sanqingshan was not severely affected by the ice-sheet. During the mid to late Tertiary, the region had a warm, humid climate, within a discrete geographical environment, providing a biotic shelter for many ancient plant species. In the early post-glacial period, as the Earth warmed, the descendants of ancient plant species recovered and propagated to produce a great variety of rare plant species concentrated in this area. Some of the principal species are: *Ginkgo biloba*, *Taxus mariei*, *Pseudotaxus chienii*, *Amentotaxus argotaenia*, *Cephalotaxus fortunei*, *Cryptomeria fortunei*, *Cunninghamia lanceolata*, *Fagus stewardiana*, *Illicium angustisepalum*, *Schisandra chinensis*, *Disanthus cercidifolius* var. *longipes*, *Quercus spinosa* and *Castanopsis eyrei* (Photos 2.25, 2.26, 2.27& 2.28).

Liriodendron chinense is a representative example of these species. It is estimated that there were more than ten species of *Liriodendron* in the Tertiary Age extensively distributed in the Northern Hemisphere. Most of them became extinct during the Quaternary Ice Age. On Mount Sanqingshan, there is a large area of *L. chinense* and *Nyssa sinensis* densely distributed. These species are related and equivalent to *L. tulipifera* and *Nyssa sylvetica* respectively found in North America. This distribution pattern provides further evidence of the geographic relict. They are considered to be living fossils surviving from ancient geographical events and are important for the study of the development and evolution of the mountain forest ecosystem over a long period of geological time. Mount Sanqingshan is thus regarded as a rare natural laboratory.



Photo 2.26 *Taxus mariei* (CSRL 2004:VU)



Photo 2.27 *Pseudotaxus chienii*
(IUCN RL 2003:EN)



Photo 2.28 *Disanthus cercidifolius* var. *longipes* (CSRL 2004:VU)

Spermatophyte

Seed-bearing ovarian plants represented in Mount Sanqingshan can be grouped into 15 different geographical zone elements. Geographic elements of Spermatophyte in China can be grouped into 15 types, each of them can be seen on Mount Sanqingshan. Ranked by the number of genera present in each geographical element, 18.46% are in the North Temperate Zone, 14.05% are in the East Asia region, 13.09% are in the Pantropic zone, and 9.37% are in the East Asia-North America region (Table 2.6). 20 families are dominant in this region, including Compositae, Rosaceae, Gramineae, Leguminosae, Labiatae, Orchidaceae, Liliaceae, Cyperaceae, Umbellifera, Theaceae, Polygonaceae, Scrophulariaceae, Rubiaceae, Euphorbiaceae, Urticaceae, Ranamilies unculaceae, Vitaceae, Lauraceae, Fagaceae, Aquifoliaceae. There are 870 species from these families, accounting for 36.7% of the number of higher plants in this region.

The representative families composed of the characteristic species of flora and the dominant species of vegetation include Pinaceae, Cupressaceae, Lauraceae, Fagaceae, Hamamelidaceae, Theaceae, Magnoliaceae, Taxaceae, Ericaceae, Rosaceae and so on, which are also the characteristic elements in nucleus flora of subtropic in China and East Asia.

Table 2.6 Spermatophyte at the nominated property by geographic zonation

| Zone-type | Number of genera | Percentage (%) |
|--------------------------------------|------------------|----------------|
| 1.Cosmopolitan | 43 | 5.92 |
| 2.Pantropic | 95 | 13.09 |
| 3.Trop. Asia/Tropic Amer. disjuncted | 21 | 2.89 |
| 4.Old world Tropics | 30 | 4.13 |
| 5.Trop.Asia to Trop.Australasia | 30 | 4.13 |
| 6.Trop.Asia to Trop. Africa | 29 | 3.99 |
| 7.Trop.Asia | 65 | 8.95 |
| 8.North Temperate | 134 | 18.46 |
| 9.E.Asia /Amer.disjuncted | 68 | 9.37 |
| 10.Old world Temperate | 54 | 7.44 |
| 11.Temperate Asia | 21 | 2.89 |
| 12.Mediterranean W.Asia to C.Asia | 10 | 1.38 |
| 13.C.Asia | 3 | 0.41 |
| 14.E.Asia | 102 | 14.05 |
| 15.Endemic to China | 21 | 2.89 |
| Total | 726 | 100 |

Disjunct Genera

Of the 15 types of distribution zones of spermatophyte genera, 2 are of disjunct distribution, i.e. tropic Asia-tropic America and East Asia-North America, have been identified. The later has more superiority than the former. 68 genera of plants are found in the nominated property belonging to the East Asia-North America disjunct distribution type. They account for 56.2% of the genera of this kind present in China (Table 7.4). Among these 68 genera are included the *Torreya*, *Pseudotsuga*, *Tsuga* of Gymnospermae. *Toxicodendron*, *Acorus*, *Aralia*, *Diphylleia*, *Mahonia*, *Pachysandra*, *Campsis*, *Catalpa*, *Chimonanthus*, *Weigela*, *Bothrocaryum*, *Hugeria*, *Lyonia*, *Pieris*, *Castanopsis*, *Lithocarpus*, *Muhlenbergia*, *Cephalanthus*, *Hamamelis*, *Liquidambar*, *Carya*, *Abelia*, *Meehania*, *Agastache*, *Lindera*, *Sassafras*, *Amphicarpaea*, *Apios*, *Cladrastis*, *Gleditsia*, *Gymnocladus*, *Kummerowia*, *Lespedeza*, *Podocarpium*, *Wisteria*, *Aletris*, *Disporum*, *Illicium*, *Liriodendron*, *Magnolia*, *Nelumbo*, *Nyssa*, *Osmanth*, *Eomecon*, *Antenoron*, *Berchemia*, *Chamaerhodos*, *Kerria*, *Photinia*, *Saurura*, *Astilbe*, *Hydrangea*, *Itea*, *Penthorum*, *Tiarella*, *Schisandra*, *Veronicastrum*, *Phryma*, *Ampelopsis Parthenocissus*, *Halesia*, *Stewartia*, *Hypopitys*, *Menispermum* of Angiosperm (Table 7.4).

Geographic Relicts

It is estimated that spermatophytes arose and developed during the Mesozoic and Tertiary (Palaeocene, Eocene). It is likely that the spermatophyte community could have been separated following the break-up and drift of the Pangaea supercontinent, resulting in the disjunct distribution pattern. Formation of the Pacific Ocean has separated the primitive angiosperm community, originally widespread across the Northern hemisphere, causing it to differentiate independently in the East Asia and North America disjunct zones.

For example, the *Magnolia* family, which is recognized as one of the oldest families of angiosperm, originated during the process of widening of the Pacific Ocean. The genus *Liriodendron* is a member of this family, with more than ten species broadly distributed across the Northern hemisphere during the Mesozoic and Tertiary. However, most of the species became extinct during the Quaternary Ice Age. Today, the only surviving two species, *L. chinense* and *L. tulipifera*, are found in China and North America respectively. Such a disjunctive distribution pattern is typical of a geographic relict. There are 12 surviving ancient plant species: *Camptotheca smyrnioides*, *Fokienia hodginsii*, *Ginkgo biloba*, *Liriodendron chinense*, *Nyssa sinensis*, *Pseudolarix kaempferi*, *Pseudotaxus chienii*, *Pseudotsuga gaussenii*, *Pteroceltis tatarinowii*, *Taxus mairei*, *Torreya grandis*, *Tsuga chinensis* var. *tchekiensis* (Photo 2.29).



Photo 2.29 *Liriodendron chinensis* (IUCN RL 2003:LR/nt)

The “Two-species Genera”

There are more than 121 genera of seed-bearing ovarian plants discontinuously distributed in temperate or subtropical in the East Asia-North America region. In Asia, besides China, Japan, Korea Peninsula, Sakhalin Archipelago of the former USSR are also distributed with few East Asia-North America disjunct genera. Most are members of ancient genera and more than half belong to the rare “two-species genera”. By “two-species genera”, we mean that one species is present in East Asia and the other in North America in a symmetrical manner, for example *Liriodendron chinensis* (China) and *L. tulipifera* (USA), *Sassafras tzumu* (China) and *S. albidum* (USA), *Magnolia denudate* (China) and *M. grandiflora* (USA). These are intriguing findings, suggesting a primordial geological relationship between the two continents. Some genera, for example *Agastache* and *Cephalanthus*, might have originated in North America and were later transplanted to East Asia across the Bering Land Bridge (Fig. 2.7).

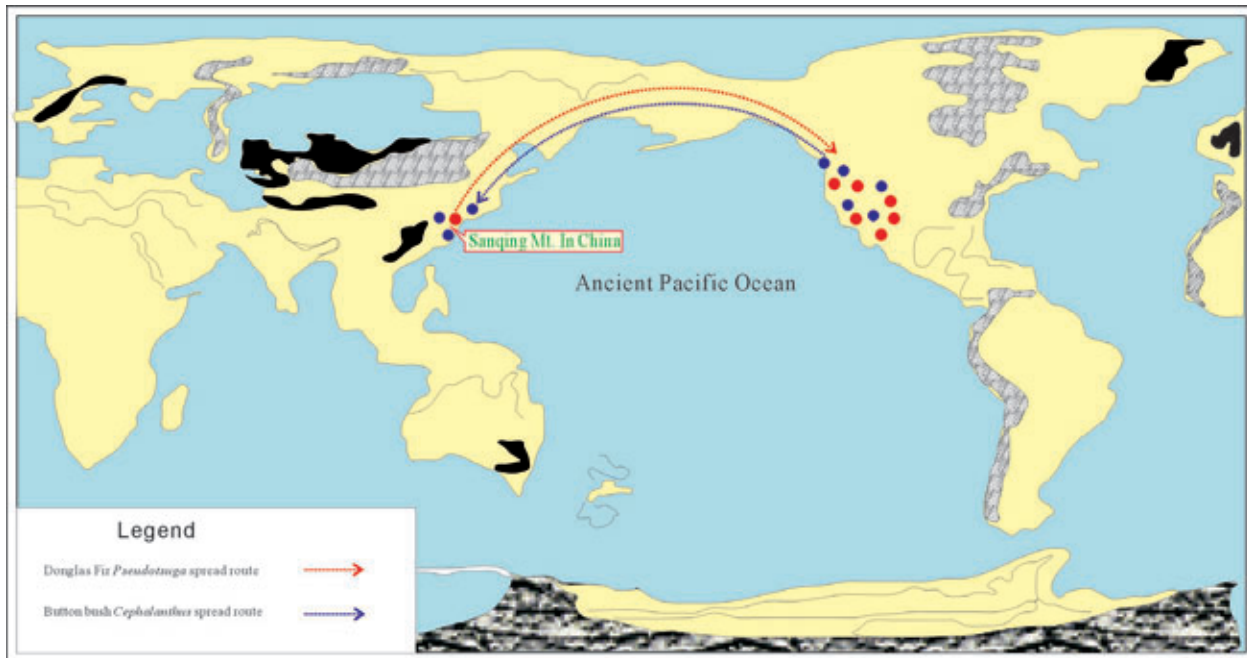


Fig.2.7 Migration route of East Asia- North America plants (*Pseudotsuga*,*Cephalanthus*)(after Linan)

Endemic genera and species to China

More than 300 endemic species, belonging to 19 genera endemic to China, are found in Mount Sanqingshan, including *Saxiglossum*, *Ginkgo*, *Pseudolarix*, *Pseudotaxus*, *Cunninghamia*, *Platycladus*, *Fokienia*, *Eomecon*, *Fortunearia*, *Cyclocarya*, *Monimopetalum*, *Camptotheca*, *Emmenopterys*, *Eucommia*, *Dysosma*, *Pteroceltis*, *Chimonanthus*, *Speirantha*, *Tapiscia* (Table 7.5).

In the case of Mount Sanqingshan, a number of species are endemic to this particular area, as listed in Tables.

There are more than 300 endemic species of vascular plant in the nominated property, including fern plants, such as *Dryopteris whangshanensis*, *Dryopteris immixta*, *Pyrrhosia sheareri*. Gymnospermae: *Ginkgo biloba*, *Pseudolarix kaempferi*, *Pseudotaxus chienii*, *Cunninghamia lanceolata*, *Cryptomeria fortunei*, *Pseudotsuga gaussenii*, *Torreya grandis*, *Taxus mairei*, *Tsuga chinensis* var. *tchekiangensis*, *Pinus taiwanensis*, *Pinus massoniana*, *Fokienia hodginsii*, *Juniperus formosana*. Angiosperms: *Magnolia cylindrical*, *Magnolia sieboldii*, *Liriodendron chinense*, *Cinnamomum japonicum*, *Dysosma versipellis*, *Coptis chinensis* var. *brevisepala*, *Magnolia officinalis* ssp. *biloba*, *Stewartia sinensis*, *Disanthus cercidifolius* var. *longipes*, *Eucommia ulmoides*, *Pteroceltis tatarinowii*, *Camptotheca acuminata*, *Monimopetalum chinense*, *Emmenopterys henryi*, most of them are common species (Table 7.6).

Rare and endangered plants

19 species of near threatened grade and above are inscribed in the IUCN Species Red List (2003), including *Ginkgo biloba*, *Pseudotaxus chienii*, *Amentotaxus argotaenia*, *Pinus taiwanensis*, *Fokienia hodginsii*, *Platycladus orientalis*, *Liriodendron chinense*, *Magnolia cylindrical*, *Cinnamomum japonicum*, *Dysosma versipellis*, *Eucommia ulmoides*, *Semiliquidambar cathayensis*, *Acer buergerianum*, *Acer longipes*, *Halesia macgregorii*, *Zenia insignis*. 92 species are inscribed in the Appendix II of Convention

on International Trade of Endangered Species including 11 species of Euphorbiaceae, such as *Euphorbia esula* in Euphorbia, and 81 species of Orchidaceae. 47 species of nearly endangered grade and above are inscribed in the China Species Red List (CSRL); 26 species are listed in the List of Wild Plants under the State Key Protection issued by the Ministry of Forestry and the Ministry of Agriculture (first rate,1999), (Photos 2.30, 2.31, 2.32 & 2.33).



Photo 2.30 *Fokienia hodginsii* (IUCN RL 2003:LR)



Photo 2.31 *Stewartia sinensis*(CSRL 2004:NT)



Photo 2.32 *Monimopetalum chinense*(CSRL 2004:VU)



Photo 2.32 *Pleione bulbocodioides*(CITES 1995: II)

2.a-5-2 Fauna

Zoogeographical zones

According to the classification of zoogeographic zoning in China, Mount Sanqingshan is located in the Oriental Realm. However, in terms of composition, it shows distinct characteristics of the Oriental Realm and is mixed with some characteristics of the Palaeoartic Realm. Of the Amphibians, Reptiles, Birds and Mammals, those species belonging to the Oriental realm account for 70% and those derived from the Palaeoartic realm account for only 30% (Table 2.7). The zoning of insects is extremely complex with the primary types being the Hindustan Malaysia system of the Oriental Realm and the Hindustan Himalayan Huaxi system. Some species in the Oriental Realm are also represented in the Palaeoartic Realm. The latest survey shows that there are 180 species of Butterfly in 113 genera in 11 families in Mount Sanqingshan, including 25 species of Papilionidae.

Table2.7 Indigenous vertebrates in the nominated property

| Type | Order | Family | Species |
|----------|-------|--------|---------|
| Pisces | 3 | 12 | 36 |
| Amphibia | 2 | 7 | 23 |
| Reptilia | 2 | 11 | 49 |
| Aves | 17 | 55 | 226 |
| Mammalia | 8 | 22 | 67 |
| Total | 32 | 107 | 401 |

Vertebrate

Of the vertebrates, 67 species (or subspecies) are Mammals in 22 families, including Erinaceidae, Talpidae, Soricidae, Rhinolophidae, Hipposideridae, Vespertilionidae, Cercopithecidae, Manidae, Leporidae, Sciuridae, Hystricidae, Rhizomyidae, Platacanthomyidae, Muridae, Canidae, Ursidae, Mustelidae, Viverridae, Felidae, Suidae, Cervidae, Bovidae.

Bird

There are 226 species (or subspecies) of Birds in 55 families, including Podicipedidae, Phalacrocoracidae, Ardeidae, Anatidae, Pandionidae, Accipitridae, Falconidae, Phasianidae, Turnicidae, Rallidae, Charadriidae, Scolopacidae, Recurvirostridae, Laridae, Columbidae, Cuculidae, Tytonidae, Strigidae, Caprimulgidae, Apodidae, Alcedinidae, Meropidae, Ccoraciidae, Upupidae, Capitonidae, Picidae, Alaudidae, Hirundinidae, Motacillidae, Campephagida, Pycmonotidae, Irenidae, Bombycillidae, Laniidae, Oriolidae, Dicruridae, Sturnidae, Corvidae, Cinclidae, Turdidae, Muscicapidae, Monarchinae, Timaliinae, Paradixornithidae, Cisticolidae, Sylviidae, Paridae, Aegithalidae, Sittidae, Dicaeidae, Zosteropidae, Estrildidae, Passeridae, Fringillidae and Emberizidae.

Reptile

There are 49 species (or subspecies) of Reptiles in 11 families, including Platysternidae, Bataguridae, Trionychidae, Agamidae, Gekkonidae, Scincidae, Lacertidae, Anguidae, Colubridae, Elapidae and Viperidae.

Amphibian

There are 23 species (or subspecies) of Amphibians in 7 families, including Cryptobranchidae, Salamandridae, Pelobatidae, Bufonidae, Hylidae, Microhylidae, Ranidae, Rhacophoridae.

Fish

There are 36 species (or subspecies) of Fish in 12 families, including Cyprinidae, Cobitidae, Homalopteridae, Siluridae, Clariidae, Bagridae, Sisoridae, Adrianichthyidae, Gobiidae, Anabantidae, Paraclupeidae, Mastacembelidae.

Insect

There are 1327 species of Insects in 882 genera of 127 families from 15 orders, including 6 species of Blattodea, 5 species of Isoptera, one species of Plecoptera, 50 species of Orthoptera, 7 species of Mantodea, 36 species of Odonata, 53 species of Homoptera, 112 species of Hemiptera, 319 species of Lepidoptera, 3 species of Megaloptera, 2 species of Neuroptera, one species of Mecoptera, 294 species of Coleoptera, 105 species of Diptera, 95 species of Hymenoptera.

Vertical Zonation

The animal population follows the rule of vertical distribution and relies on the environment to a certain extent.

In the underside mountain zone with the altitude lower than 500m, typical species include *Melogale moschata*, *Meles meles*, *Arctonyx collaris*, *Garrulax galbanus*, *Pycnonotus sinensis*, *Garrulax canorus*, *Parus*

major, *Takydromus septentrionalis*, *Zaocys dhumnades*, *Gloydus brevicaudus*, *Rana nigromaculata*, *Rana limnocharis*, *Polypedates megacephalus*, *Daimio tethys*, *Graphium sarpedon*, *Eurema hecabe*, *Charaxes bernardus*, *Neptis hylas* and *Neptis sappho*. Various water-birds and other aquatic vertebrates such as *Lutra lutra*, *Mergus squamatus*, *Aix galericulata*, *Platysternon megacephalum* and *Rana rugulosa* are found in the Xinjiang, Raohe and Qiyi lake environments in this zone.

In the mountain side zone with the altitude ranging from 500m to 1,000m, typical species include *Macaca mulatta*, *Macaca thibetana*, *Elaphodus cephalophus*, *Syrmaticus ellioti*, *Tragopan caboti*, *Lophura nycthemera*, *Pucrasia macrolopha*, *Trimeresurus stejnegeri*, *Dienagkistrodon acutus*, *Andrias davidianus*, *Rana spinosa*, *Ochloides subhualina*, *Neptis pryleri*, *Neptis sappho*, and *Graphium sarpedon*.

In the mountaintop zone elevated from 1,000 to 1,816m, typical species distributed include *Muntiacus crinifrons*, *Neofelis nebulosa*, *Panthera pardus*, *Viverra zibetha*, *Viverricula indica*, *Capricornis sumatraensis*, *Ochloides subhyalina* and *Ypthima conjuncta*.

Endemic animals

The nominated property is the habitat of 37 species endemic to China, belonging to 34 genera(Table 2.8), including :

Mammals such as *Macaca thibetana*, *Lepus sinensis*, *Rhizomys pruinosus latouchei*, *Rhizomys sinensis*, *Hydropotes inermis*, *Muntiacus crinifrons*;

Birds such as *Ixobrychus sinensis*, *Mergus spuamatus Gluld*, *Syrmaticus ellioti*, *Tragopan caboti*, *Lophura nycthemera*, *Pucrasia macrolopha*, *Bambusicola thoracica*, *Gallixrex cinerea*, *Streptopelia chinensis*, *Otus bakkamoena*, *Garrulax canorus*, *Garrulax galbanus*, *Paradoxornis webbianus*, *Parus venustulus*;

Reptiles such as *Big-headed turtle*, *Pareas chinensis*, *Macropisthodon rudis*, *Plagiopholis styani*, *Calliophis kelloggi*, *Naja atra*, *Ovophis monticola*, *Trimeresurus stejnegeri*;

Amphibians such as *Cynops orientalis*, *Hyla chinensis*, *Rana tigrina*;

Fishes such as *Garra orientalis*, *Abbottina fukiensis*, *Pelteobagrus fulvidraco*;

Butterflies such as *Teinopalpus aureus*, *Graphium cloanthus*, *Agehana elwesi*, *Helcyra superba*, *Stichophthalma howqua*, *Wagimo sulgeri*, *Ussuriana takarana*, *Lethe insana*, *Lethe christophi*.

Table 2.8 Endemic vertebrates and insects in the nominated property

| | Mammalia | Aves | Reptilia | Amphibia | Pisces | Rhopalocera |
|---------------------------|----------|------|----------|----------|--------|-------------|
| Endemic number of species | 6 | 9 | 7 | 3 | 3 | 9 |

Rare and endangered Animals

23 species of vertebrates and insects are inscribed in the IUCN Species Red List: *Neofelis nebulosa*, *Panthera pardus*, *Muntiacus crinifrons*, *Macaca mulatta*, *Macaca thibetana*, *Manis pentadactyla*, *Cuon alpinus*, *Selenarctos thibetanus*, *Profelis temmincki*, *Hydrophotes inermis*, *Capricornis sumatraensis*, *Micromys minutus*, *Hystrix brachyura*, *Tragopan caboti*, *Syrmaticus ellioti*, *Vanellus vanellus*, *Vanellus cinereus*, *Bombycilla garrulus*, *Rhinomyias brunneata*, *Platysternon megacephalum*, *Chinemys reevesii*, *Pelodiscus sinensis* (Table 7.8), (Photos 2.34, 2.35, 2.36, 2.37, 2.38, 2.39, 2.40 & 2.41).

54 species are inscribed in the Appendix I II III of CITES (1995); 94 species on China Species Red List (2004); 53 species of wild animals and plants are under state-level key protection (1989) (Table 7.8).

In particular, *Garrulax galbanus* in the Sylviidae genus, Passeriformes is an endemic sub-species of China with a limited distribution, as far as known, there are less than 200 in the world. IUCN Species Red List designated as LR (Photo 2.42).



Photo 2.34 *Panthera pardus* (IUCN RL 2003:EN)



Photo 2.35 *Macaca thibetana*
(IUCN RL 2003:LR/cd)



Photo 2.36 *Spilornis cheela* (CITES
1995: II)



Photo 2.37 *Phinomyias brunneata* (IUCN RL 2003:VU)



Photo 2.38 *Garrulax canorus* (CITES 1995: II)



Photo 2.40 *Mergus squamatus* (IUCN RL 2003:EN)



Photo 2.41 *Chinemys reevesii*
(IUCN RL 2003:EN)



Photo 2.39 *Vanellellus vanellus* (IUCN RL 2003:LR)



Photo 2.42 *Garrulax galbanus* (IUCN RL 1994:NT)

The Chinese Anteater *Manis pentadactyla*

Seven species of anteaters or pangolins are included in the family Manidae. They are confined to the warmer parts of Asia and Africa. Hunting and habitat destruction have made these strangely scaled mammals one of the most endangered groups in the world.

The growing human population has pushed the demand for Pangolin (Photo 2.43) derivatives to an unprecedented high. They are captured for their scales and flesh, which are believed to have medicinal properties. The illegal trade in Pangolin has long been of global concern. The Anteater is protected by Chinese law and the CITES international convention on endangered species.



Photo 2.43 *Manis pentadactyla* (IUCN RL 2003:LR)

On Mount Sanqingshan, the indigenous population of Anteaters is afforded a degree of protection in this special habitat which is managed and conserved under laws of State Key Protection.



Photo 2.43 *Capricornis sumatraensis* (IUCN RL 2003:VU)

Capricornis sumatraensis

Three species of Serow survive in central and eastern Asia. They are ungulates with a strange appearance giving the impression that they have been forged from a mixture of animals, including goat, antelope and sheep. Hence, they are often termed “goat antelopes”.

They are known in the fossil record from the late Pliocene and reached their greatest diversity in the Quaternary Ice Age, when many species adapted to marginal, often extreme environments, such as mountains, deserts and the sub-Arctic region. Most of the Ice Age species are now extinct, probably largely because of human interaction. Of the survivors worldwide, 5 are classified as endangered,

8 as vulnerable, 7 as of concern and 7 are secure. On Mount Sanqingshan, the rare *Capricornis sumatraensis* (Photo 2.44) is found grazing on the middle slopes, either singly or in groups of up to seven individuals. It is able to climb with some agility to escape predation or to take shelter during cold winters or hot summers. They are resource defenders and mark their territory with scent produced from the pre-orbital glands. The Serow is on the China Species Red List, the IUCN Red List, CITES Level I and enjoys State-level Key Protection (Table 7.8).

Syrmaticus ellioti* , *Tragopan cabotii

7 species of pheasant lived in Mount Sanqingshan, of which, *Syrmaticus ellioti* and *Tragopan cabotii* are listed as World Endangered Species of IUCN RL . Two are inscribed in Appendix I of CITES. Three are assigned to China Species Red List. Four species were designated as state-level key protection wild animal (Table 7.8).

Syrmaticus ellioti (Photo 2.45) lives in the eastern and southern areas to the south of Yangtze river. It is the typical champaign subregion species of middle China's southern knap in the Oriental Realm. It has many different vegetation types as its habitat, such as laurisilvae, the mixed forest with broad-leaved evergreen and deciduous trees, the mixed forest with broad-leaved evergreens and coniferous, acicular bamboo forest and bushes with laurisilvae. Mixed forest is its favoured habitat, with acicular as its second best habitat. With its well-preserved vegetation and plentiful laurisilvae and acicular, the environment of Mount Sanqingshan is an ideal habitat for *S.ellioti*, where it occurs in significant numbers.



Photo 2.45 *Syrmaticus ellioti* (IUCN RL 2003:VU)

Tragopan cabotii (Photo 2.46) lives mainly in the middle Asian tropical laurisilvae and Jiangxi's broad-leaved evergreen forests. Its habitat is primarily in the laurisilvae, the mixed forest with broad-leaved evergreen and deciduous trees, and the mixed forest with broad-leaved evergreens and conifers. The extensive areas of laurisilvae on Mount Shanqingshan provide an ideal protected habitat for *T. cabotii*.



Photo 2.46 *Tragopan caboti* (IUCN RL 2003:VU)

Muntiacus crinifrons

Feeding mainly on the leaves and buds of trees, the Black Muntjac (Photo 2.47) is a sub-tropical mountainous woodland animal. It stands about 46 cm high and is one of the smallest species of deer. Its chief habitat is the mountainous broad leaved evergreen forest and is sometimes found in the evergreen or deciduous broad-leaved mixed forest and scrub. It can also be found amongst the bushes and trees of the high mountainous areas above 1,000 metres. Once widespread throughout southeast China, today it is restricted to the lower reaches of the Yangtze River within the Jiangxi, Anhui and Zhejiang province region.

Mount Sanqingshan is one of the principal distributing centres for this vulnerable and endangered animal. The latest survey shows that the Black Muntjac survives in some numbers here because the favourable mix of vegetation and altitude provides an ideal habitat and it is under State Protection. Like the Serow, it eats shoots and leaves. Connecting with the State-designated Natural Reserve Areas of Gutian mountain and Shier mountain, Mount Sanqingshan provides a communicating corridor for the Black Muntjac population.



Photo 2.47 *Muntiacus crinifrons* (IUCN RL 2003:VU)

This facilitates genetic exchange, minimises in-breeding, and reduces fragmentation of the population. The nominated property plays an important role in the protection of the Black Muntjac to First Class Key Conservation category.

The Biogeographical Background of Mount Sanqingshan

Intercontinental disjunct distribution of plant species

The distribution of originally relic species of plants results in both the succession and the adaptation to geographic, climatic and environmental change over time. The disjunct distribution is one of the most important distribution patterns of plants. In the case of disjunct distribution, plants belonging to the same genus can be found to occupy parallel but distinct geographic regions. The distance separating these regions is much greater than that which can be accounted for by seeds of the different species distributed by normal means.

Several explanations have been advanced to account for the discontinuously distributed plant species. Some may arise as a result of long range dispersal of the plant communities in two regions; some occur through geographic change resulting in the separation of two regions by ocean; others could arise due to continental drift, island formation, or the disappearance of a land bridge. It is important to study the cause of the discontinuity, not just in plant geography, but also to investigate progressive changes of geology, geography and climate of a region over geological time. Such study could shed light on the movement of tectonic plates and the separation of continents.

East Asia - North America Phytogeographical kinship

The botanical richness of China is unrivalled in temperate latitudes. With an estimated more than 30,000 species of higher plants, China holds one-eighth of the world's total plant species, including thousands endemic to China. By comparison, in North America, the United States and Canada contain only about 20,000 native plant species. The great plant diversity of China is the product of many interacting factors, including topography, climatic variation and ancient geological history. These have combined to produce a wide range of ecological environments, unparalleled in any other country. Nowhere else within the borders of a single country is there to be found an unbroken connection between tropical, subtropical, temperate and boreal forests. It is splendid that for the most part, these forest vegetations can be found in one special place –Mount Sanqingshan.

Disjunct distribution

The disjunct distribution of the same or closely related taxa of plants between eastern North America and eastern Asia is but one of several patterns of disjunction that become evident when the flora of the temperate Northern Hemisphere is considered (Raven, 1972; Thorne, 1972). Of these, the classic eastern Asian–eastern North American pattern is undoubtedly the best known example of the disjunct occurrence of closely related taxa on two continents separated by thousands of kilometres of ocean. Recently, most of the shared taxa in the two regions have been found to be distinct from one another because of the great difference in molecular structure between them. They are primarily



closely related species of the same genus, or closely related genera of the same family. Great similarity of molecule structures was also sometimes found between closely related species of the same genus, suggesting countless ties couple them together. Biogeographers argued that the same or similar climate and ecological environment between east Asia and north America have strengthened the impression of a strong biological connection between the two regions. The similarities of the forests community of central China and the southern Appalachians, in both composition of species and ecological associations, is so great that a sense of *déjà vu* is experienced by a botanist from one region visiting the other.

Mainland China and continental North America share a common latitude and similar sized land area. The climates in much of the two regions are also similar, most notably in the eastern halves. Many plant species that were once widespread throughout the entire Northern Hemisphere were wiped out by glaciation during the Quarternary in North America, but survived in China in, for example, the biotic refuge of Mount Sanqingshan. 121 genera in 60 families of plants have disjunct populations in eastern Asia and temperate North America, relicts of the once widespread flora. Many genera known only from the fossil records in North America and Europe are still extant in China.

Charles Darwin in a letter (2nd May 1856) to Asa Gray wrote “America might be related to Eastern Asia (always excluding Arctic forms) by a genus having the same species confined to these two regions; or it might be related by the genus having different species, the genus itself not being found elsewhere.” After Darwin had received information from Gray, he wrote back in October 1856, saying “Nothing surprises me more than the greater general and specific affinity between the eastern North American flora and the eastern Asian flora, an affinity greater than that between the eastern and western North American floras. I wonder if climate might explain such affinity.”

Meanwhile, in the Southern Hemisphere, J D Hooker was analysing the New Zealand flora and its affinities with the floras of Australia, Tasmania and temperate South America. Hooker wrote (1853) that “Enough is here given to show than many of the peculiarities of each of the three great areas of land in the southern latitudes are representative ones, effecting a botanical relationship as strong as that which prevails throughout the lands within the Arctic and Northern Temperate zones, and which is not to be accounted for by any theory of transport of variation, but which is agreeable to the hypothesis of all being members of a once more extensive flora, which was broken up by geological and climatic causes.”

Differentiation and evolution of relic plants

A disjunct pattern between eastern Asia and eastern North America occurs in 65 genera of flowering plants. Phylogenetic analyses have shown that most intercontinental species pairs are not sister species. Diversification of species has occurred in one or both continents and a few disjuncts have even differentiated into distinct genera.



The Magnoliaceae have an interesting modern distribution (Fig. 2.8). Of the 80 or so species in the genus *Magnolia*, the majority are found in south-east Asia, while only 26 species are found in the Americas, from Ontario in Canada down to the top of South America.

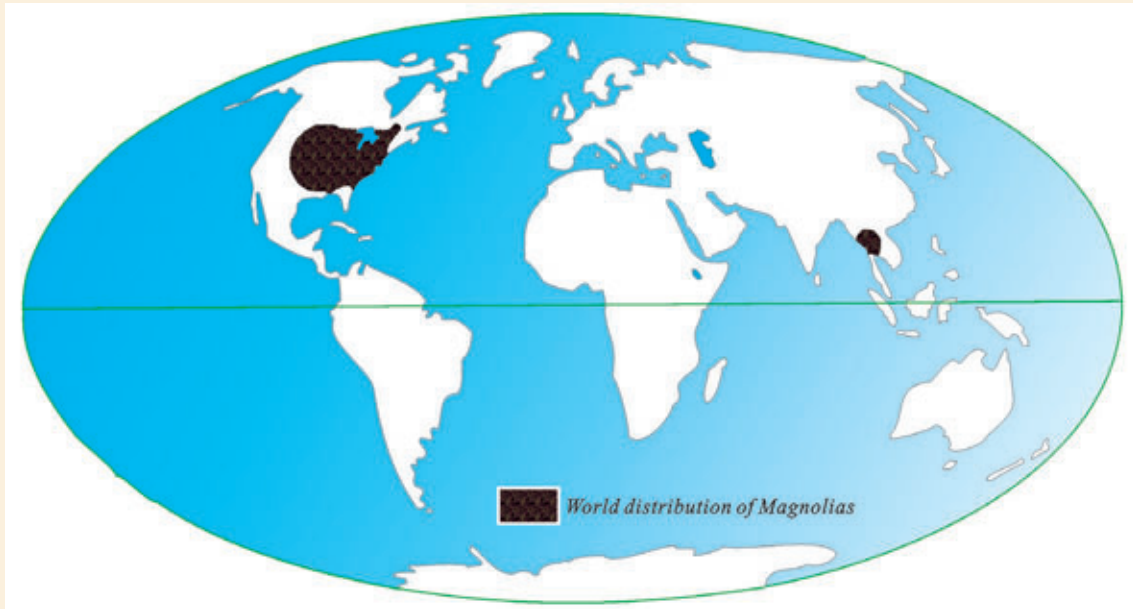


Fig. 2.8 World distribution of *Magnolias* (after Cox and Moore, 1985)

As recently as less than 5 million years ago (Wen, 1999), they became separated (disjunct) into two principal centres, which cannot be explained simply in terms of climatic sensitivities: the magnolias are reasonably hardy plants and can be cultivated well into the north of the Temperate Zone. For as much as 70 million years, the magnolias were widely distributed in a broadly continuous belt

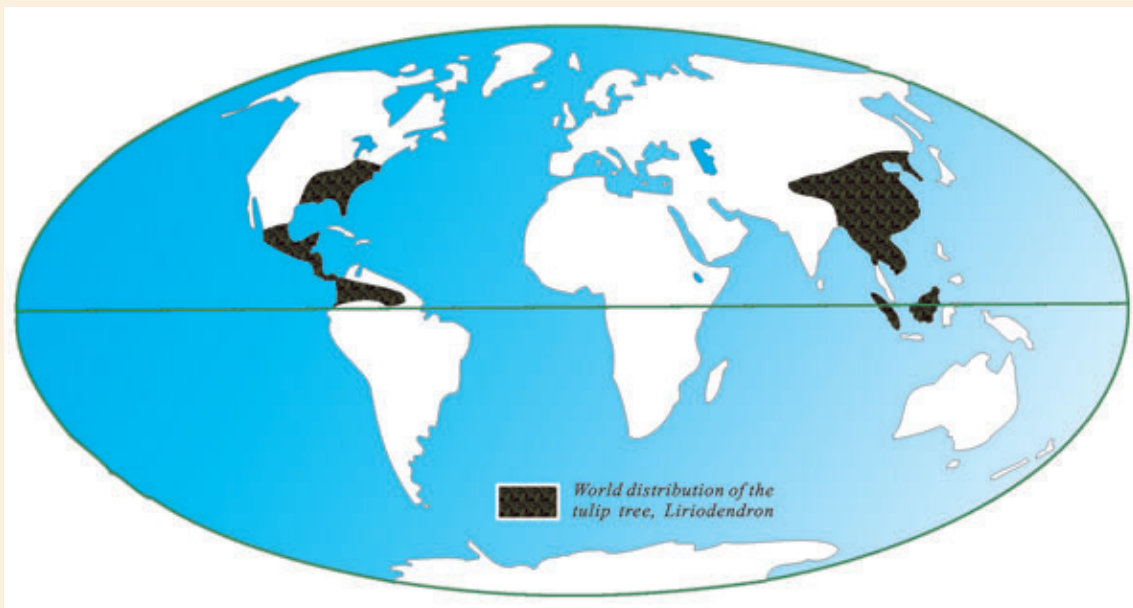


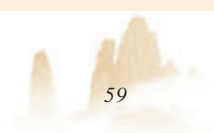
Fig. 2.9 World distribution of the tulip tree, *Liriodendron*. Only two species survive in widely separated localities (after Cox and Moore, 1985)



across the tropical, subtropical and temperate parts of the world. When the extreme climatic fluctuations of the last 2 million years disturbed their stable woodland environment, they became extinct across most of their former range, including Europe and north to Greenland. Only in two parts of the world have they survived as evolutionary relicts, one of them being in the biotic refuge of Mount Sanqingshan.

Interestingly, another genus of the magnolia family, the tulip tree, *Liriodendron*, has a very similar distribution to that of the *Magnolia* genus (Fig. 2.9) and in all probability shares a similar fossil history. But, with a major difference: in the case of the tulip tree, only two species have survived *Liriodendron chinensis* in a small area focused on Mount Sanqingshan in China and *L. tulipifera* in North America, where it is a successful component of the deciduous temperate forests.

Fossil, geologic, molecular and phylogenetic evidence suggests complex origins of the disjunct pattern between eastern Asia and North America. The “Asia Gray Disjunction” probably originated at different times and through different mechanisms. Molecular and fossil data suggest that the disjunct pattern dates back at least to the Miocene. Both the Bering and the North Atlantic land bridges probably played important roles in the evolution of the Miocene deciduous forests. The deterioration of the temperate flora in western North America and in Europe during the Pliocene and the Quaternary ice age caused the present distributional pattern.



2.a-6 Unusual and Beautiful Natural Scenery

While the granite landforms are the most valued component of the Sanqingshan landscape, other landscape resources are important, both in their own right, and also in building a completely integrated landscape system. The five landscape qualities that make the area one of the most unusual and beautiful landscapes of China and the world are: the granite morphology, the impressive meteorological effects, the hydrological system, the biodiversity, rare species and mountain ecosystem, and the Taoism cultural landscape unique to China at this site. The nominated property includes 7 scenic areas, over 100 scenic spots and 361 individual landforms of note.

Granite morphological landscape resource

The granite morphological landscape has outstanding aesthetic and scientific values. Broad vistas of the mountain are truly spectacular, easily rivalling any in the world's other granite mountain landscapes, while at the smaller scale the various landforms such as peak forest and pictographic stones hold great interest in their detail. The pictographic stone landscape of Sanqingshan is widely celebrated for its remarkably like-life natural sculptures, such as the Oriental Goddess, Gigantic Boa, Wanhuchaotian, Colorful Screen at Ninth Heaven, Thousands of Peaks Competing for the Best, Three Dragons Rushing to Sea and Guanyin Enjoys Music (Table 2.9), (Photos 2.48, 2.49, 2.50, 2.51, 2.52, 2.53&2.54).



Photo 2.48 Nanqing peak forest



Photo 2.49 Gigantic Boa



Photo 2.50 Oriental Goddess





Photo 2.51 Peak forest of spring





Photo 2.52 Thousands peaks showing lovely scenery



Photo 2.53 Old Taoist worshipping the moon



Photo 2.54 Celestial Turtle searching in sea

Table 2.9 Types and characteristics of rare granite morphological landscapes

| Type | Name | Location | Landscape characteristics |
|------------------------------|---|-------------------------|---|
| Peak forest landscape | Peak cluster at Heaven Gate | Tiyun Ridge scenic area | Composed of 25 peaks, standing at an elevation of 1,500m-1,600m, with a relative relief of over 300m, surrounded in clouds all year around, it produces a spectacular view with great momentum. |
| Peak forest | Colorful Screen at Ninth Heaven | Yujing Peak scenic area | Standing at an elevation of 1,680m, with a relative relief of over 400m; single peak body is 380m in length and 87m in width; with overlapped peaks standing tall and upright, looking like a huge nature screen, thus producing a great view. |
| | Thousands of Peaks Competing for the Best | Tiyun Ridge scenic area | Standing at 1,500m-1,700m above the sea, over 30 peaks rise gradually from east to west, with their peaks forming different pictographic landscape, among which there are large areas of <i>p.gausenii</i> etc. densely planted, producing a God-making landscape painting. |
| | Wanhu-chaotian | Tiyun Ridge scenic area | Composed of 11 neatly standing rock peaks, with a single rock being 10m-15m thick, 30m-60m wide and 250m high. Standing at 1,300m above the sea level, they boast one of the rare landscapes in Sanqingshan. |
| | Yujing Peak | Yujing Peak scenic area | It is the biggest peak forest with the highest altitude and largest relative relief at Sanqingshan. Its three highest peaks are steep and great, clustered among hundreds of peaks of different sizes. Among the peaks, Yujing Peak stands at 1,816.9m above the sea level, and Yuxu and Yuhua at over 1,750m. |
| Pictographic stone landscape | Oriental Goddess | | Standing on the peak at an elevation of 1,300m, it is composed of a “Base” and “Goddess”, totalling 86m in height. The “Goddess” looks like sitting cross-legged; with clear five sense organs, she looks like gazing at things far in distance, with her hands put on lap full of kindness and affection. The vivid art piece reflects the power and might of the nature. It is called “Oriental Goddess”, implying the message that she is the beautiful goddess teaching people about cultivating methods and passing on prescriptions for curing diseases. The landscape is one of unique sceneries in Sanqingshan. |
| | Gigantic Boa | Tiyun Ridge scenic area | Rising from the valley at 1,260m above the sea level; the stone pillar is 128m high, with diameter of the finest part of the pillar only 7m, and of the widest part 30m, it looks like a vivid Python, true to life and incredible. It is also one of the landmark sceneries in Sanqingshan. |
| | Guanyin Enjoys Music | Tiyun Ridge scenic area | Standing on the top of peaks, with an altitude of 1,600m, it is composed of three overlapped peaks. The back peak is like a Guanyin in a dress smock, putting hands together praying; the front two peaks, one is the lute modelling, the other appearance shape Taoist priest, from afar, it looks like a Taoist priest playing the lute and Guanyin is savoring a piece of beautiful music. |



Continued Table 2.9 Types and characteristics of rare granite morphological landscapes

| Type | Name | Location | Landscape characteristics |
|------|-----------------------------------|-------------------------|---|
| | King-Monkey presenting a Treasure | Tiyun Ridge scenic area | On the peak top of over 1,530m above the sea level, stands a lonely huge stone, which is 28m in height. It looks like Monkey King in Chinese mythical novel, holding a treasure in hands, serious looking, who is piously presenting the treasure. It is also one of the rare landscapes of Sanqingshan. |
| | Three dragons rushing to Sea | Tiyun Ridge scenic area | Located at the west side of Yuhuang Peak in Nanqingyuan, at an elevation of 1,560m. Three peak columns rise directly into the sky, with an average height of over 130m, just like the form of “Oriental Dragon” representing Chinese People, which is blowing a cloud and rising up in the sky, thus achieving peak perfection with great momentum. |
| | Penguin presenting a peach | Tiyun Ridge scenic area | Located among valley at an elevation of 1,300m. A huge saucer peach is surrounded by several naïve looking little penguins (only 3m tall). In such a grand valley, it is rare to have such refined small photographic stone microlandscape, which should be an unsurpassed creature of Mother Nature. |

Picturesque meteorological landscape resource

Various special meteorological phenomena occur over Sanqingshan and greatly enhance the spectacular nature of the landscape. The most important of these phenomena are: Cloud Sea (the rising of clouds around the mountain massif, frequently to a height lower than the highest footpaths, so that visitors can look down on the upper surface of clouds), Cloud Waterfall (where the cloud tumbles over the highest peaks, rather like a broad waterfall), Sanqing Divine Light (the halo effect commonly seen under special light conditions in mountainous areas), Five Colors Road in the Clouds (beautiful diffraction of light through the cloud cover to provide a number of distinct colours), and Meteor Showers (easy visible because of the high quality of the air over Sanqingshan). In addition, there are many days during winter when the mountain is blanketed in snow, creating yet another landscape type (Table 2.10), (Photos 2.55, 2.56, 2.57, 2.58 & 2.59).



Photo 2.55 Halo light in darkness



Photo 2.56 Sanqing divine light



Photo 2.57 Cloud water fall



Photo 2.58 Colourful road amid cloud



Photo 2.59 Awfully stirring billows

Table 2.10 Types and characteristics of meteorological landscapes

| Type | Name | Location | Landscape characteristics |
|--------------------------------|-------------------------------|---|---|
| Meteorological landscape | Sanqing Divine Light | Main peak of Yutai, Yujing and Sanqing Temple | During summer and winter, the sun shines again after rain, human shape will be wrapped in a colorful halo in the misty dawn; the halo follows closely the shape, and the mysterious and magnificent phenomenon has formed a most rare meteorological landscape of the nature. According to Chinese folk custom, whoever encountering the landscape is the one with fortune. |
| | Colorful Road amid Cloud | Yutai, West Coast | If the sun shines again after rain, steam evaporates among overlapped peaks. Every time when big difference in air pressure occurs because of high altitude, there will be a colorful staircase spiraling into the sky, which is the so-called “Magic Staircase Ascending to the Heaven”, thus boasting a very strange and unusual view. |
| | Cloud Sea and Cloud Waterfall | Sea of Clouds: Yutai, Yujing Peak and Wind & Storm Pagoda Waterfall of Clouds: Xihai, Yuhua Peak, and Ziyan shi | Being in subtropical monsoon zone, Sanqingshan has abundant rainfall (with an annual average rainfall of 2,000mm). There is a magnificent view of the cloud sea at all seasons, with occasional cloud waterfall pouring down from the peak top, thus producing a great view. |
| Astronomic phenomena landscape | Sunrise at Sanqingshan | Yutai, Yujing peak and Wind & Storm Pagoda | As the main peak at Huaiyu Mountain range, Sanqingshan boasts the best place for watching sunrise with its high and steep mountain formation. In early morning, the sun spurts out, like a huge gilded hook, a glittering red cover, a blazing lantern and a flaming fire ball, boasting a gorgeous and magnificent view. |
| | Meteor shower | Sanqing Temple, Oriental Goddess | There is clear sky and bright moonlight at night on Sanqingshan, when meteor often passes in the sky. A dense gathering of meteor will produce the rare celestial phenomena landscape of meteor shower of various scales, and records of several landscape of the kind have been left. |

Ecological landscape resources and rare plant and animal resources

There are two aspects to this landscape quality. Firstly is the wealth of rare plants and animals, such as the ancient *Pseudotsuga gaussenii* that grows over large tracts of the mountain, as well as the untouched quality of the mixed ecological landscape. The richness and density of the forested cover, together with poor accessibility and negligible human impact, give to Sanqingshan a true wilderness quality. Secondly, the vegetation of the mountain and the conifers in particular blend wonderfully and greatly enhance the visual delight of the granite landforms (Table 2.11), (Photos 2.60, 2.61, 2.62&2.63).



Table 2.11 Types and characteristics of rare plant landscapes

| Type | Name | Location | Landscape characteristics |
|-----------------|--------------------------|--|--|
| Plant landscape | <i>p.gausenii</i> forest | Primitive forest to the west of Sanqing Temple | The same category as Douglas Fir, it is an outstanding example of intercontinental intermittent distribution type of plant community. It is rare for the genre to be densely growing here, covering a space of 160ha. Growing tall and straight, with needle-like leaves, it falls into the category of national Grade I preserved plant. |
| | Taiwan Pine Forest | Yutai Peak and Sanqing Temple area | Around Sanqing Temple, it is densely covered with ancient pine trees, which are over 1,000 years of age, and cover an area of 66.6ha. The unyieldingly standing firs form one of typical plant landscapes in Sanqingshan. |
| | Indian azalea forest | Above the elevation of 1,000m | There are such species as <i>Rhododendron simiarum</i> Hance var. <i>simiarum</i> etc., <i>Rhododendron fortunei</i> Lindl and <i>Rhododendron latoucheae</i> Franch. et Finet, etc., with tree age of over 1,000 years and height of 5m-6m, each of which is so big that one could just get his arms around. During May and July in each year, there is a magnificent view of the blooming azalea, especially at the section of Ten-mile azalea at Nanqingyuan and the north to Sanqing Temple. |



Photo 2.60 Pine like a conyop



Photo 2.61 Mythical pine



Photo 2.62 Thousands pine forest

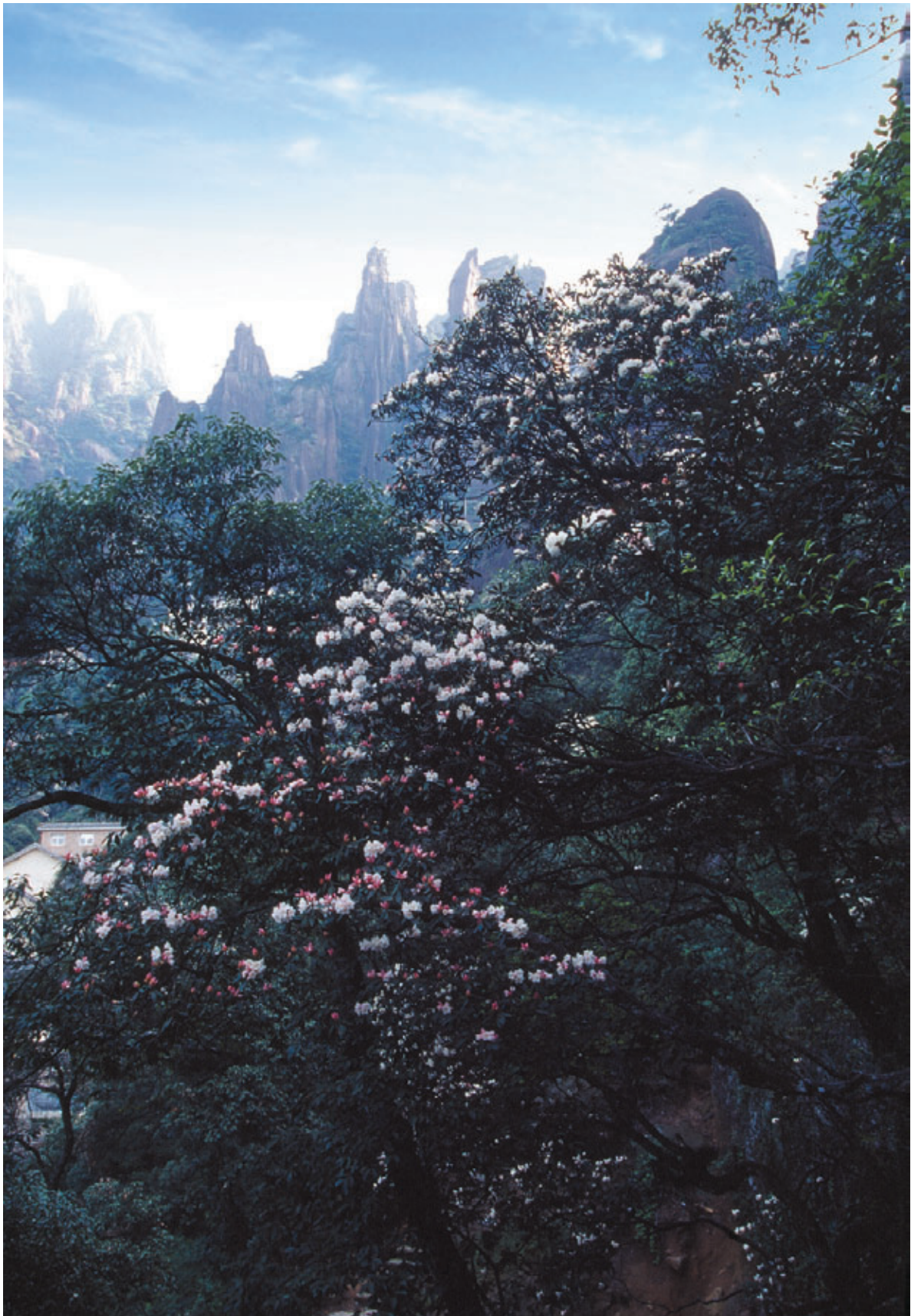


Photo 2.63 Ten'Li' azalea

Landscape resource of lakes and waterfalls

Flowing water in streams add life and energy to the whole scene and Sanqingshan's rich water landscape of rivers, lakes and waterfalls contributes significantly to the overall landscape quality of the mountain.(Table 2.12), (Photos 2.64&2.65)



Photo 2.64 Three-step waterfalls



Photo 2.65 Jade Curtain Waterfalls

Table 2.12 Types and characteristics of lake and waterfall landscapes

| Type | Name | Location | Landscape characteristics |
|-------------------------------|--------------------------|----------------------------------|---|
| Lake landscape | Sanqing Lake | At the east of Mount Sanqingshan | With a storage capacity of 170 million cubic meters, the lake body is in a belt shape, winding among the mountains. It is 5,000m wide at the widest point and 58m at the narrowest on the lake. With breeze, ripples are produced, and high mountains, blue sky and white clouds get their reflection in the water, all forming an enchanting landscape of mountains and lakes. |
| Waterfall landscape | Yulian Waterfall | Shiguling Landscape | Being over 60m in fall and 30m in width, it pours from steep cliff, and spatters water smoke. Under certain angle in the sunshine, there may form a colorful rainbow, making tourists carefree and joyous. |
| | Longtan Waterfall | Baji Longtan | Hiding among the dense forest, Longtan Waterfall pours from the steep cliff, and its turbulent water is divided into two parts. The resonant water can be heard even from a place as far as beyond 8km. The waterfall has a fall of 21m, and its pool is surrounded by ancient trees, which is untraversed, thus boasting an excellent ecological environment. |
| Landscape at the river source | Source of Qiantang River | Fangtang | Qiantang River, the famous scenic spot for tide watching, has one of its major sources at Mount Sanqingshan, which is also the source of another river, Xinjiang River, the second largest river in Jiangxi Province. Most importantly, exuberant forest and excellent eco-environment are the foundation for the river source. |

Landscape resource of Taoism culture

Taoism is an ancient religious culture unique to China, from where it has spread to other countries in East Asia (e.g., Japan, South Korea and North Korea). Sanqingshan has been an important spiritual centre for Taoism since the East Jin Dynasty (A.D.317-A.D. 420) and today historic Taoist stone structures, such as Sanqing Temple, Dragon and Tiger Palace and Wind and Storm Pagoda, remain important relics of the Taoism culture and add significantly to the cultural landscape of Sanqingshan. The Taoist heritage of buildings, crafts and stone carving of Mt Sanqingshan still has an important influence in both China and other countries. (Table 2.13), (Photos 2.66, 2.67&2.68).



Photo 2.66 Wind and Thunder Pagoda

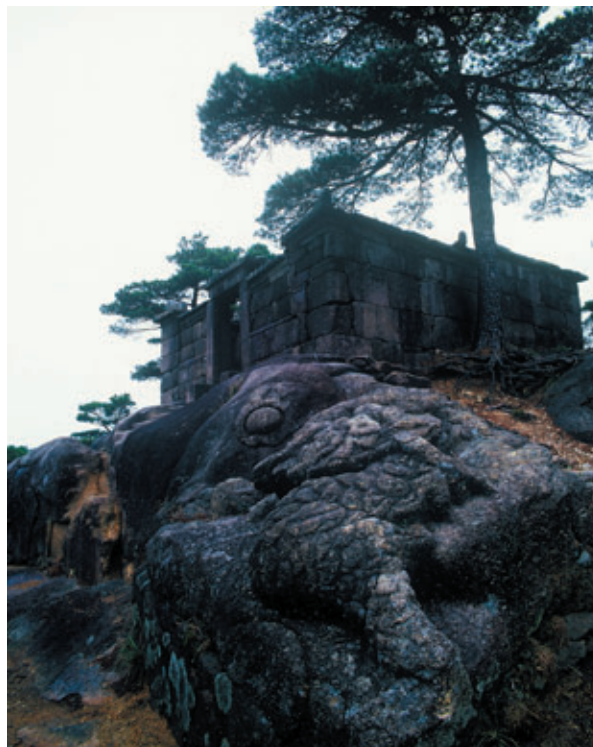


Photo 2.67 Dragon and Tiger Temple



Photo 2.68 Sanqing Palace

Table 2.13 Type and characteristics of Taoism cultural landscapes

| Type | Name | Location | Landscape characteristics |
|------------------------------|-------------------------|------------------------------------|--|
| Stone construction landscape | Sanqing Temple | Scenic spot of Sanqing Temple | Once as “National Religion”, Taoism is the main part of China religious culture and it has a long history. Ge Hong, a famous alchemist in dynasty of “Dong Jin”(A.D.317-A.D.420) traveled here and made pills of immortality, and there is an ancient Taoism building reserved at Sanqingshan. Sanqing Temple, with an elevation of 1,532.8m, is the core and main part for ancient Taoism buildings on the mountain, covering a space of 2,300m ² . It is a typical stone construction of Taoism temple, with simple and unsophisticated architectural style. The site is close to mountain and water, which can avoid from wind draught but is exposed to the sun. With Nine Dragon Mountain at its back and dipper in its front, the Temple enjoys an excellent geomantic omen for Taoism. |
| | Dragon and Tiger Palace | To the northeast of Sanqing Temple | It is one of major ancient Taoist buildings on the Mountain; facing water at its three sides. Stone carvings of the two crouching tigers and winding dragons at both sides of the palace gate are especially precious, with dragons hiding among the walls and tigers crouching on the stones, which vividly imply the influence of China’s Taoism, thus having superlative historic study and aesthetic value. |
| | Wind & Storm Pagoda | Sanqing Temple area | Built during Ming Dynasty, the exquisitely built pagoda is a hept-layered and hexa-facade stone construction. After over 500 years, bearing sunshine and rain, the stone pagoda is in iron black color. It is located at the best place for watching sunrise. When the sun rises in the cloud sea, there is a magnificent view of the blending of red sun, white cloud and black pagoda, producing a grant natural scene with superb aesthetic value. |

2.a-7 Human Activities

Thanks to the precipitous nature of the terrain and its remoteness, the Sanqingshan area has received very little human interference in the last 300 years. Although some people moved to the area in more recent times, even today it is not densely populated. Currently, the nominated property has a population of 5,790 (a density of 20.9 people per km²). Its location on the border of three provinces and lack of transport infrastructure continues to ensure a low population density. Inhabiting the villages surrounding the base of the mountain massif, they practice primitive farming methods. Accordingly, the population has little impact on the ecology, geology and landforms of the nominated property, but rather helps to maintain them.

2.b History and Development

2.b-1 History of Nature

The nominated property holds evidence of nearly 1 billion years of continuous geological evolution, in a part of the world that has been especially active and holds evidence of a very mobile history of plate movement. This history started before the late Pre-Cambrian (Neoproterozoic) supercontinent Rodinia had formed (Table 2.1). In the process of this history the area has witnessed the collision of continental plates and the formation of Rodinia, a continent locked by glaciers during the time of 'Snowball Earth', subsequent continental rifting and associated volcanism, further plate collision to form the Yangzi palaeo-plate, crustal extension and marine transgression, intracontinental subduction and orogeny with the emplacement of the Sanqingshan granites, and further extension to form basin and range terrain.

The nomination property is located in the suture zone of the Neoproterozoic Yangzi and Cathaysia palaeo-plates, where since the Mesozoic, intracontinental A type subduction and subsequent crustal extension founded the geotectonic and geographical framework, within which was emplaced the Sanqingshan granite. The geological history provided just the right environment for the formation of the outstanding granite landforms, unique ecology and human development.

(i) Evolution of South China Ocean and Huaiyu Island Arc

Between the late stage of the Middle Proterozoic to the early stage of the Neoproterozoic the nomination area was part of an island arc system, located between the Yangzi and Cathaysia palaeo-plates in the ancient South China Ocean (Fig.2.1 marked by HY). About 850 million years ago the palaeo-plates collided and amalgamated, and the area became a part of the Rodinia supercontinent (Fig. 2.10). Evidence of the collision and the resulting Jinning orogenesis is found in the residual oceanic crust, which is represented today by the ophiolite melange (901 Ma.) and glaucophane schist (866 Ma.) located in the suture zone adjoining the nomination area.

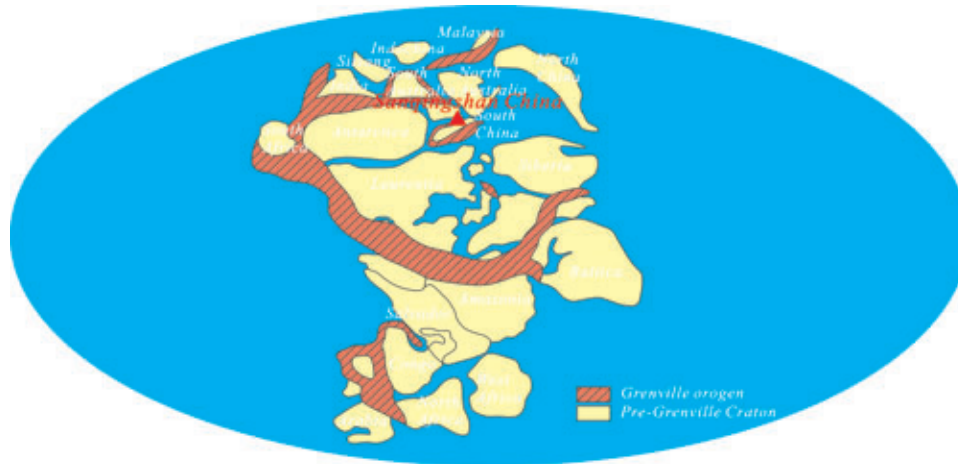


Fig.2.10 Palinspastic scheme of Rodinia Supercontinent (after Lu Songnian,2001)

(ii) Formation and evolution of South China Rift

The period from 830 Ma. to 800 Ma. saw continental rifting and the break-up of the Rodinia continental plate. As the rift widened to an ocean, the nomination area was located in the transitional zone between the Yangzi continental plate and the basin of the South China Ocean. Molasse and flysch deposits were laid down in the marine environment, while volcanism associated with the crustal rifting produce dash and lavas. In the Early Nanhua Epoch the nomination property had become located in a coastal and epicontinental marine environment in which clastic sediments were laid down. At this time the Earth was gripped by some of the severest glaciations in earth history – the Cryogenian glaciations (750–700 Ma.) – giving rise to the term ‘Snowball Earth’. Tillite from two of these glaciations occurs in the nominated property.

By the Sinian Period the continental crust had stabilized, the climate was getting warmer and an extensive marine transgression occurred. Neritic facies were deposited in the shallow sea: they transformed today into pelitic siliceous and carbonate formations in the nominated property.

Like many other areas of the world, in the early Cambrian period the Mt Sanqingshan area suffered a major anoxic event. At this time the nomination site was covered by a shallow neritic sea, within which was deposited 100m–300m of black laminated shales. At the base of the shale, thin beds and lenses of coal were formed, probably from the organic debris that resulted from mass extinction of organisms caused by the anoxic event. The shale, rich in vanadium, uranium, sulfur and phosphorous, intercalates with coal and is an important economic resource. Following the anoxic event, in the early-late Cambrian the nomination area experienced a marine transgression, when neritic carbonate and calcareous pelitic sediments several hundreds of metres thick were deposited. At the same time there was an explosion of life forms (part of the world-wide Cambrian Explosion of Life), when Brachiopods and the Trilobite, Agnostum appeared in large numbers.

By the early-middle Ordovician period the marine environment covering the nomination area had stabilized. This was the period of the world-wide ‘Ordovician Biodiversification Event’, and the stable marine conditions benefited the expansion and evolution of graptolites, resulting in the formation of the Graptolite Shale,

while later an abundant shelly fauna gave rise to beds of carbonates. By the end of the Ordovician crustal movements were frequent and in association with a general uplift the sea became progressively shallower, while the coast further became an estuarine delta and then a delta plain. Succeeding this, in the early-middle Silurian clastic deposits of flysch-like character were deposited across the area. At the climax of the Caledonian movements the crust as a whole was uplifted and became subjected to a long period of denudation and levelling. In consequence, strata from the middle Silurian and early-middle Devonian periods are missing from the local stratigraphical succession.

(iii) Formation of South China Continent

By the close of the Caledonian Movement, the Yangzi and Cathaysia palaeoplates had amalgamated to form a single South China palaeocontinent, the latter also probably connected to the Palaeoasian palaeocontinent. During the late Devonian period, sea water from the palaeocean Tethys transgressed across the South China continent. In the Sanqingshan area in the late Devonian and early Triassic periods coastal and neritic silts, carbonates, alternating marine/continental clastic sediments with coal were deposited. By the end of the middle Triassic the intensive Indo-China earth movements ended the widespread marine transgression and uplift created a regional discordance between the middle and upper Triassic deposits. This was the time when the South China palaeocontinent became a component of the Eurasian continental plate (Fig. 2.11).

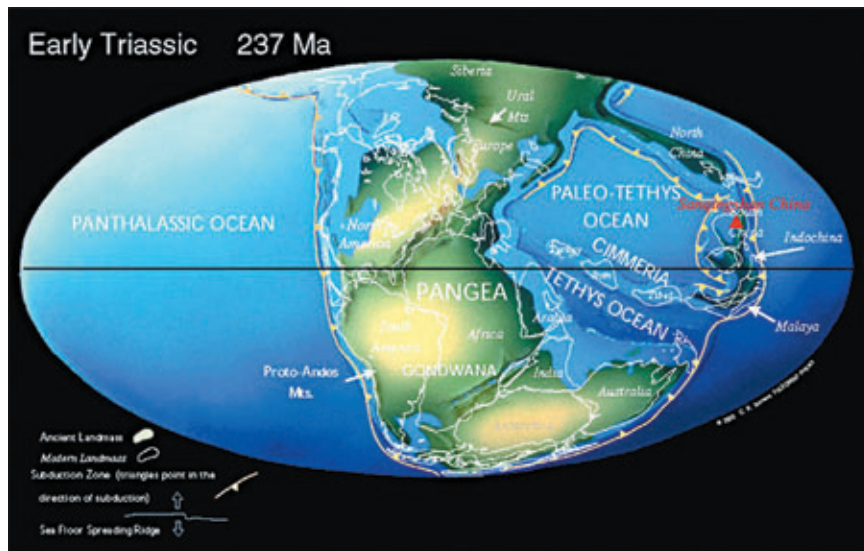


Fig.2.11 Palinspastic scheme for Triassic palaeogeography

(iv) Continental landform and biological evolution since the Mesozoic Era

200 million years ago the long marine period ended and was followed by a period of continental development. The Mesozoic Era was full of life: gymnosperm plants flourished and dinosaurs roamed the Earth. It was also an important period for the formation of granites and mountain building and laid the foundations for the present day granite geology, geomorphology and ecology of Mt Sanqingshan. Whilst it is difficult to reconstruct the events of the Mesozoic and Cenozoic, important evidence is held in the strata, rocks, landforms and genes of organisms.

In the Triassic period, the nominated property and surrounding area was underlain by a synclinorium and the

landscape had low relief. Through the succeeding geological periods this area became transformed into the present basin and range type landscape. An early key to this geological evolution was the intensive Yanshanian intracontinental orogeny, a product of the physical interactions between the Eurasian and Palaeo-Pacific lithospheric plates in the Jurassic period. Intracontinental subduction occurred at the site of the Northeast Jiangxi Deep Fracture Zone, leading to the emplacement of the Sanqingshan granite, while compressional movements began to uplift the Huaiyu mountain range, early denudation products of which were deposited in the continental basins lying either side of the mountain range. At this time the continental plates of Eurasia and North America were connected.

In the succeeding Himalayan Epoch the crust was subjected to intensive post-orogenic extension and large scale movement of crustal blocks, creating basin and range. The Huaiyu mountain range was further uplifted and subjected to intensive erosion. As a result of the erosion of an estimated 4-5km thickness of overlying rock, granite became exposed for the first time at the surface. Both sides of the mountain range were subjected to uneven rift faulting creating faulted basins that eventually filled with red clastic sediments. The Xinjiang fault basin on the south side was larger than the basin on the north and eventually filled with 2km-3km of sediment. Towards the end of this period when the Huaiyu mountain range was forming the Eurasian and North American continents began to separate.

Relative stability returned to the area during the Paleogene and Neogene, when erosion and deposition proceeded very slowly. However, through this period and into the Early to Middle Quaternary the crust was slowly uplifting, as evidenced in the three stepped erosion surfaces, (900m, 1,200m, 1,500m) In the Xinjiang Valley the uplift is reflected in three stepped terraces. Eventually the pace of uplift decreased, although differential uplift and subsidence continued along some faults. This was the case in the centre of the Huaiyu mountain range, where an area constrained by three bounding normal faults started to uplift over and above the more general uplift of the mountain range. This 'uplift on uplift' produced Sanqingshan and the highest mountain of the Huaiyu range. This was also the process that exposed the mountain top to erosion and began the formation of the 'peak forest'.

(v) Evolution of organisms

The area of the nominated property became dry land in the late Triassic after the Indo-China tectonic movements caused the ocean to recede. By the late Cretaceous dinosaurs were roaming the Xinjiang basin to the south of Mt Sanqingshan. Land plants had also colonised the area and species mainly belonging to Gymnospermae, such as Cycas, Ginkgo, Pinus and Cupressaceae, took their hold. Mammals and Angiosperm propagated and developed vigorously in Paleocene and Eocene.

2.b-2 Human History

The earliest recorded human activities in the Mt Sanqingshan area date back to the East Jin Dynasty (A.D. 317-A.D.420). 1,600 years ago the Taoist priest, Ge Hong, came to the mountain to make pills of immortality and to preach. Since the Ming Dynasty, Taoism declined and there were scarcely any human activities at Sanqing Temple or in the surrounding area. Sanqing regained its wild and untouched status. Human impact

was minimal because Taoism teaches that people must live in harmony with and respect nature.

Three hundred years ago there was migration of some people to Mt Sanqingshan from the east coast in order to avoid pirates. They settled and farmed in the valleys surrounding the mountain, but because the population was small, harvesting of natural resources such as forestry, hunting and fishing remained sustainable. Besides, as practicing Taoists, local people treasured nature and protected the environment.

Today, because of a general low awareness about the special qualities of the mountain, poor development of the local communities and poor accessibility, Mt Sanqingshan has remained a virtually pristine environment. In the larger conservation (buffer) zone there is just a population of 6,000 people and no large towns. Furthermore, in recent years new policies, laws and regulations have been introduced as a way of further protecting the outstanding environmental qualities of the nominated property.

2.b-3 Recent Conservation History

Protected by a wild, forested terrain, steep slopes and general inaccessibility, the outstanding landscape value of Mt Sanqingshan was not recognised until the beginning of the 1980s. Up to that time the mountain had been left to natural forces. On the whole, conservation of the nominated property therefore may be divided into three stages:

1. Protection and sustainable harvesting of resources by local people

As noted above, the culture of local people has been one that consciously respects nature and protects the environment in order to sustain their existence. Even though the population is expanding, this cultural tradition still survives in the challenging environment of the mountain.

2. Preservation by village law

Each village has traditionally formulated rules and regulations for the protection of forests and sources of drinking water, reflecting a high degree of conservation concern. Village rules and regulations are accepted through common practice and observed by all villagers as a form of primitive law.

3. State sponsored preservation and management

Since the establishment of the People's Republic of China, the state has attached great importance to the protection of the nominated property. In 1984 the Shangrao Regional Party Committee and Shangrao Administrative Office set up a special team to manage Shangrao Region Scenic Spots and a county level Administration for Mount Sanqingshan Scenic Area. In 1988, Mount Sanqingshan was designated a National Park of China, placing the natural resources under the highest level of protection and management. In 1996 the former Shangrao Regional Party Committee and Shangrao Administrative Office approved the establishment of the Management Committee of Mount Sanqingshan National Park. The new administrative responsibilities meant enlargement of the preservation and management duties within the nominated property. Most recently, on 1st October, 2005, in recognition of its outstanding geological and landscape qualities, Mount Sanqingshan was designated a National Geopark by the Ministry of Land and Resources. In March 2006, Sanqingshan was described on the List of National Natural Heritage by the Ministry of Construction.



SANQINGSHAN
CHINA

3. JUSTIFICATION FOR INSCRIPTION

- 3.a Criteria under which Inscription is Proposed
- 3.b Proposed Statement of Outstanding Universal Value
- 3.c Comparative Analysis
- 3.d Integrity



3. JUSTIFICATION FOR INSCRIPTION

Mount Sanqingshan is a stunning visual spectacle as well as an internationally important earth science and biological sites. With a geological record spanning 1 billion years of Earth's history, it displays outstanding examples of some of the world's most significant geological events. The spectacular and unique geomorphological mountain landscape nurtures exceptional biodiversity and served as a biotic refuge for many now rare and endangered animals and plants. These special features are protected in a National Park of extraordinary beauty and natural phenomena, managed for conservation, public enjoyment, scientific study and education. It can be justified as one of the natural wonders of the world.

3.a Criteria under which Inscription is Proposed

In accordance with the Operational Guidelines for the Implementation of the World Heritage Convention (section IID, UNESCO, February, 2005), this Proposal to inscribe Mount Sanqingshan on the World Heritage List is based on:

- **Criterion vii:** contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;
- **Criterion viii:** be outstanding example representing major stages of Earth's history, including the record of life, significant ongoing geological processes in the development of landforms, or significant geomorphic or physiographic features;
- **Criterion ix:** be outstanding example representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, freshwater, coastal and marine ecosystems and communities of plants and animals.

Criterion vii: contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.

The territory of the nominated property contains landscape resources of exceptional beauty and richness. Its aesthetic quality is one that combines remarkable granite landforms with a diversity of rare, old and beautifully formed tree species, abundant wildlife, near and distant vistas and spectacular meteorological effects. The landscape is truly stunning - all the more remarkable because of the high scientific values it holds, making Mount Sanqingshan an outstanding natural museum.

The nominated property includes 5 scenery types, more than 100 scenic spots and 361 individual landforms of note. It displays an extraordinary landscape constructed of fantastically shaped granite landforms. In particular, the landscape represented by peak forest and pictographic stones (naturally sculpted rocks) is of incomparable rarity and aesthetic value. These features are best preserved on Mount Sanqingshan because, unlike most other granite mountains of China and the world, it escaped the destructive effects of glaciation.

The Sanqingshan landscape is therefore unique.

The distribution of the landscape resources within the nominated property is remarkably consistent in character and integrity. Such consistency across the whole property demonstrates great scientific and aesthetic integrity. Nevertheless, within the broader landscape type, sub-types of scenery occurring in different parts of the mountain also demonstrate a relative local integrity. The landscape integrity is fundamental in enabling effective management of the nominated property and its ongoing importance as a natural treasure, recreational resource and scientific laboratory.

Criterion viii: be outstanding example, representing major stages of Earth's history, including the record of life, significant ongoing geological processes in the development of landforms, or significant geomorphic or physiographic features.

The principal focus of the nomination is on the property's granite geology and rare granite landforms, although also of great importance the site is located within a local geology that spans over 1 billion years of earth history and holds evidence of some of the Earth's most important geological events.

Mount Sanqingshan is a granite mountain massif located within the suture zone formed by the collision of the Yangzi and Cathaysia lithospheric plates during the Late Neoproterozoic ($850 \pm \text{Ma}$). The granitoid rocks in the nominated property and its surroundings are represented by four genetic types: M, I, S and A. Except for the Middle-Neoproterozoic M type, the Late Mesozoic I, S and A types, evolved in sequence over time. These correspond to the early, middle and late stages of crustal movement and evolutionary development of the granite magma and its intrusion into the crust. The depth of granite emplacement varies, belonging to Hypogene (Sanqingshan, Lingshan), hypergene (Tongchang) and subsurficial (Yinshan - the volcanic vent). Rock texture also varies, the rocks exhibiting: granite texture, porphyric texture, rapakivi texture and texture of mixed magma, and miarolitic structure. It is rare to find in such a small area of the World such a rich granite sequence and assemblage of high scientific significance.

Uplift and stripping of the granite, along with its fracturing, provided just the right conditions for the formation of a remarkable collection of granite landforms, not seen in such quantity or diversity of form anywhere else in the world. The granite landforms also hold evidence of different stages of their evolution.

In addition to the remarkable granite geology, the nominated property holds evidence of five geological events of global significance:

- closure of the Middle Neoproterozoic South China Ocean and collision of the Yangzi and Cathaysia continental plates that further amalgamated to the supercontinent Rodinia
- Late Neoproterozoic break-up of Rodinia and the onset of the Nanhua (Cryogenian) world-wide glaciation (Snow-Ball Earth)
- the Cambrian anoxic event, the Cambrian Explosion of Life and the Great Ordovician Biodiversification Event
- Middle-Late Jurassic to Early Cretaceous (Yanshanian) intracontinental A type subduction and orogeny,

- Late Cretaceous intracontinental extension orogeny and formation of basin and range

Of further special note, the nomination property holds evidence of continuing uplift since the (start of the) Quaternary Period and displays a history of evolution of the granite landforms. The property also holds evidence of global environmental changes since the Mesozoic Era, resulting in the intercontinental disjunct distribution of 68 genera of plants. The nominated property is therefore important to the world's scientific community, not only because it records major stages and significant events in the Earth's evolutionary history, but also because it provides a natural laboratory for the study of ongoing geological, geomorphological and biological processes.

Criterion ix: be outstanding example, representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.

The nominated property is a protected reserve for rare and endangered species that have survived from the Mesozoic and Tertiary Eras. Examples of these species are *Pseudotsuga gaussenii*, *Tsuga chinensis* var. *tchekiensis* and *Liriodendron chinense*. Furthermore, Mt Sanqingshan served as the biotic refuge of East Asia during last the Ice Age. *P. gaussenii* (corresponding to *P. menziesii* in North America), occupies 533 ha. as a forest, and its monoculture area extends to 160 ha., it is associated with *Tsuga chinensis* var. *tchekiensis* over much of the area, which is rare in the world. *Liriodendron chinense* (corresponding to *L. tulipifera* in North America), a geographical relict from the Quaternary, is distributed here in sectors. Mt Sanqingshan has 68 genera of the plants found in the disjunct distribution zone across East Asia and North America, which account for 56.2% of the genera of this kind in China.

The nominated property is an outstanding example of the East Asia-North America intercontinental disjunct distribution of plant species. It is the key location in which to study plant community development and serves as a "natural laboratory" in which to study speciation and ecological processes, which have evolved through geological, palaeogeographic and palaeoclimatic changes.

It is further relevant that the nominated property is on the headwater of Xinjiang River, which is an important tributary of Poyang Lake. Poyang Lake is the greatest freshwater wetland in the Yangtze River Basin. The freshwater bio-diversity of the Yangtze River is one of the hot spots of WWF 'Global 200', thus, the nominated property exerts an extremely important influence on the protection of the biodiversity of this freshwater system.

Of additional importance, the nominated property is a protected refuge for many rare and endangered species of animal, including *Taxus mairei*, *Pseudotaxus chienii*, *Tragopan caboti*, *Syrnaticus ellioti*, *Mutiacus crinifrons*, *Manis pentadactylus* and *Capricornis sumatraensis*. It is also one of the most biodiverse in China.

3.b Proposed Statement of Outstanding Universal Value

The nominated property of Mount Sanqingshan displays:

- 1) a unique assemblage of granite landforms, the scale, diversity, quantity and quality of which are second to none
- 2) an international exemplar that helps to explain the origins of granites and the context for their emplacement, particularly within the Circum-Pacific region
- 3) international significance for 1 billion years of continuous geological history and the evidence it holds of many of the Earth's major geological events
- 4) international importance for the study of intercontinental discontinuous distribution of plants species and relict plants
- 5) one of the most biodiverse environments in East Asia
- 6) spectacular natural beauty, different from any other granite mountain site in the world

(i) Mount Sanqingshan has a unique assemblage of granite landforms, the scale, diversity, quantity, quality and visual splendour of which are second to none

A spectacular range of granite landform types are present in the nominated property, including overlapped peaks, peak-walls, peak clusters, peak forests, stone forests, peak pillar, stone cone, gorge, cliffs and rich pictographic stones. In the central part of the mountain massif, an area of 2,800 ha, the different genetic types of granite are densely distributed. The landforms number 361 individual features of note, including 48 granite peaks and 89 pictographic stones. In recognition of the unique qualities of this landscape it has been termed in China the "Mount Sanqingshan Type".

The landforms have evolved because of a unique combination of factors, including:

- . a favourable lithology-structural relationship between the younger fine-grained granite of the stock in the center of mountain and the coarser granite of the triangular block which makes up the main mountain mass
- . rapid uplift of the granite block from which they were carved
- . the structurally massive and hard (resistant) character of the granite
- . a rate of structural uplift that may have exceeded the rate of denudation
- . a fan-shaped system of deep vertical fractures, crossed by horizontal ones
- . a wet and warm sub-tropical monsoon climate which has promoted weathering
- . pronounced erosion by rain and fluvial down-cutting controlled by the fractures in the rock

Of further significance, this landscape assemblage reveals a record of the endogenous and exogenous geological processes that have been extant since the Meso-Cenozoic Eras.

(ii) The granite geology of the nominated property provides an international exemplar that helps to explain the origins of granites and the context for their emplacement, particularly within the Circum-Pacific region

The nominated property is a mountainous area, composed largely of early Cretaceous A-type granite. In the property and within the surrounding area, are an M type “oceanic” plagiogranite dating from more than 900Ma., a relict from the Proterozoic South China Ocean, and a granite series formed during the Mesozoic intra-continental deep subduction. The latter was a product in response to subduction of the Paleopacific Plate, and gave rise to I, S and A types of granite, representing two tectonic-magmatic zones. Thus, with such a visible and complete tectonic-magmatic evolutionary sequence, Mt Sanqingshan is an extremely important area in which to study granites, particularly the orogenic granite resulting from intracontinental deep subduction.

(iii) The nominated property holds international significance in displaying 1 billion years of continuous geological history and the evidence it holds of many of the Earth’s major geological events

Nine to ten hundred million years ago the nominated property was a volcanic island in the South China Ocean. About 850Ma, the Yangzi Paleoplate and Cathaysian Paleoplate collided with each other and the ocean basin disappeared. The nominated property is thus located at the suture of two palaeoplates. Four well-preserved major geological formations can also be found from the Middle of the Neoproterozoic South China Ocean, the Neoproterozoic plate collision, the Mesozoic intracontinental A type subduction, and the Late Cretaceous intracontinental extension. These provide evidence of major geological events and the evolutionary history of the Earth. Mt Sanqingshan is an important area in which to study tectonic plate evolution and changes in the paleogeographic environment across 1 billion years of geological time. In this respect, the Middle to Neo-Proterozoic ophiolite-melange belt has recently been discovered in the nominated property, it is one of very few such belts that has been found in the world. Dated to 901Ma., the ophiolite, together with oceanic plagiogranite and glaucophane schist formed in a high pressure and low temperature metamorphic regime. Formation of these different facies at the same place within the nominated property, is an extremely rare occurrence.

(iv) The nominated property is of international importance for the study of intercontinental disjunct distribution of plant species and relict plants

There are 68 genera of plants on Mount Sanqingshan which belong to the East Asia-North America intercontinental disjunct distribution type. They account for 56.2% of the total of the type in China (121 genera). Of particular note is the *Pseudotsuga gaussenii* community and *Tsuga chinensis* var. *tchekiangensis* which occupy a large area in the nominated property, to an extent rarely seen in the world. The area of its distribution reaches 533 ha., including a monoculture of *Pseudotsuga* extending to 160 ha., representing the historical record of the development of *Pseudotsuga* and *Tsuga* that corresponds to *P. macrocarpa* (Vasey) Mayr in the East Circum-Pacific orogenic belt of North America. It provides additional evidence of the close relationship between East Asia and North America, and of the plate tectonic events which have occurred in the Earth’s past. It has world significance in terms of biogeography and biosystematics.

There are several surviving relict genera in the nominated property, including *Ginkgo*, *Taxus*, *Pseudotaxus*, *Amentotaxus*, *Cephalotaxus*, *Cryptomeria*, *Cunninghamia*, *Fokienia*, *Cyclocarya*, *Alnus*, *Fagus*, *Illicium*, *Schisandra* and *Disanthus*. Mt Sanqingshan is testimony to the evolutionary history of plants, spanning the Palaeozoic to the Quaternary, as well as being a “biotic refuge” during the Quaternary Glacial Period.

(v) The nominated property is one of the most biodiverse environments in East Asia

The nominated property houses a range of ecosystem types found in East Asia, which encourages a rich biotic diversity. These include warm mountainous middle sub-tropical humid evergreen broad-leaved forest, which has become one of the most abundant ecosystem types in East Asia. The variety of higher plants is prodigious, with 245 families, 984 genera and 2,373 species present on Mount Sanqingshan. Animal life is equally prodigious, with 67 species of mammals, 226 species of birds, 49 species of reptiles, 23 species of amphibians, 36 species of fish and 1,327 species of insects recorded in the nominated property.

However, many of these species are endangered and rely upon the sanctuary of the protected environment of Mount Sanqingshan. 45 species are listed in the IUCN Species Red List (2003); 92 plants and 54 animals are listed in the Appendix of CITES(1995); 144 species are inscribed on China Species Red List (2004); 26 plants and 53 animals are under State-level Key Protection.

(vi) The nominated property has unique and spectacular natural beauty, different from that of any other granite mountain site in the world

Mount Sanqingshan displays a range of remarkable natural features and visual phenomena, providing the highest aesthetic, artistic and conservation values.

The statutory technical instrument “Standards of Planning in Scenic Areas” establishes a classification system for Chinese landscapes, both natural and man-made. This special instrument defines the parameters of 2 classes, 8 groups and 74 different types of landscapes. The landscapes of Mount Sanqingshan cover all of these defined classes and groups and 87.5% of types. Such a rich variety of landscapes in one nominated property is exceptional, both at home and abroad.

The Sanqingshan landscape is rich in fantastic rock formations. The granite landscapes of pictographic stones on Mount Sanqingshan are unsurpassed. For example, the “Gigantic Boa” is a stone column rising to 128m, with a diameter at the narrowest point of only 7m, it has the appearance of a huge snake, true to life and incredible. The “Oriental Goddess” is an unsurpassed creation of Mother Nature, appreciated as a natural masterpiece without equal. The goddess represents the figure, manner and expression of what is perceived to be the attributes of a perfect oriental woman. It reflects the power and might of nature. The fantastical formations and the natural artistic quality of the pictographic stones confer a superlative charm and aesthetic upon Mount Sanqingshan.

All of Mount Sanqingshan's landscapes are set within distinctive vertical zoning (Fig.3.1). The mountain massif, which rises steeply from 200m to 1,816.9m a.s.l. at Yujing Peak, has four distinctive zones. Composed of granite base rock, granite landforms and associated ecosystems, these zones can be differentiated in terms of altitude, structure, scenery, fauna and flora.

Zone I (1,500m-1,816.9m): is composed of granite overlapped peaks, peak cluster, with coniferous forest and low forest on the summit;

Zone II (1,000m-1,500m): is composed of granite peak wall, stone forest, peak pillar, and pictographic stone, with coniferous forest, broadleaved/coniferous mixed forest. This zone has been described as a "high mountain sculpted landscape";

Zone III (500m-1,000m): is composed of granite cliff, waterfall, gorge, with broadleaved/coniferous mixed forest and evergreen broadleaved forest;

Zone IV (< 500m): is composed of granite valleys and gentle hills, with evergreen broadleaved forest. In summary, not only does the natural beauty of the nominated property have outstanding aesthetic and artistic value, but it is a remarkably important environment for the protection and nurture of endangered animals and plants. Mount Sanqingshan is also a place for people to discover the wonders of nature, a place for painters, photographers, musicians, sculptors, writers and artists to work and to create, and a classroom for education, teaching and scientific investigation.

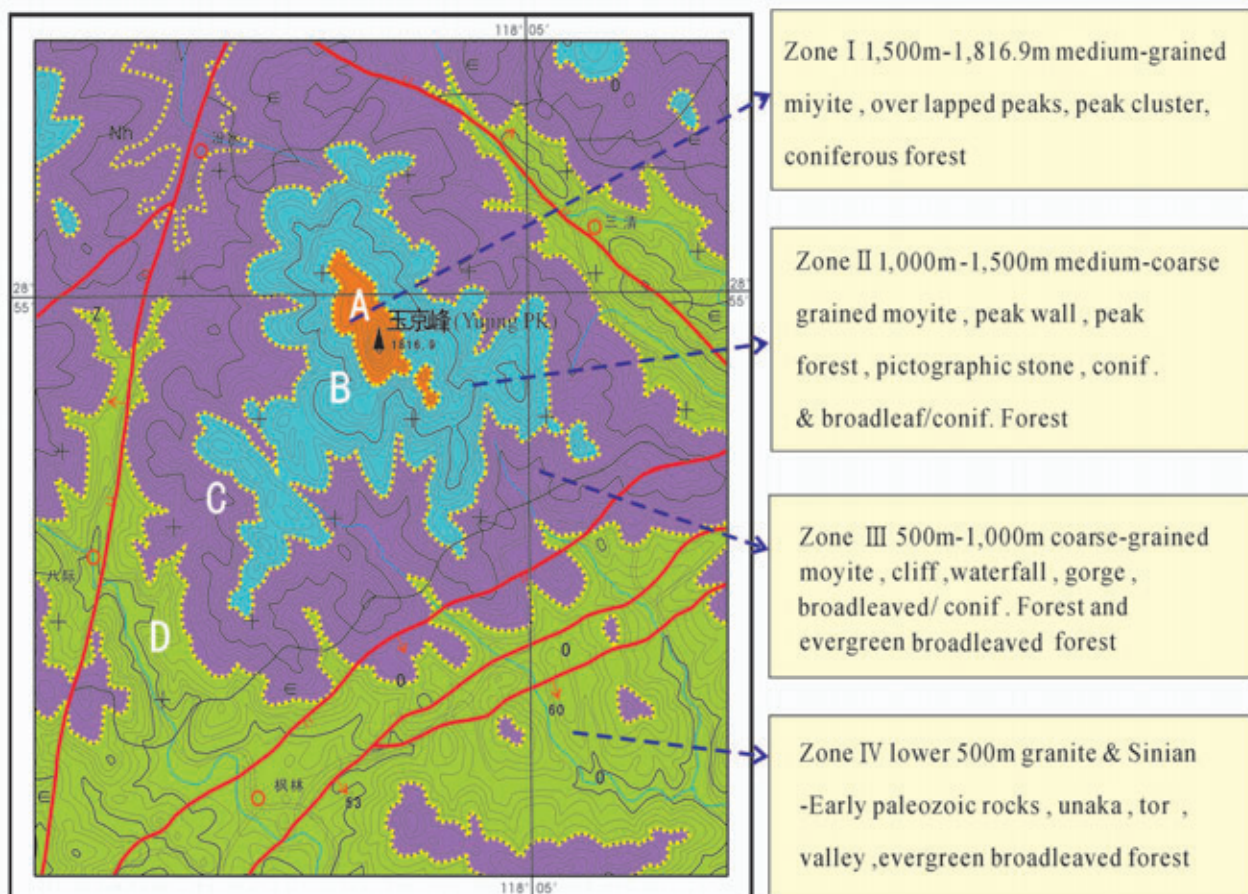


Fig. 3.1 Landscape zones on Mount Sanqingshan (Yin Guosheng, 2006)

3.c Comparative Analysis (including state of conservation of similar properties)

The nominated property is one of the world's most remarkable natural treasures, both in respect of its stunning visual qualities and its outstanding scientific values. The importance of the latter lies in the contribution they make to current and future research and to the global geological and biological conservation resource. Because of the very limited historic impact of people and development on Mount Sanqingshan, it is one of the very few places left in China which supports an essentially undamaged, fully integrated, natural system. This comparative analysis will investigate the extent to which Mount Sanqingshan's natural values can not be found in other sites around the world.

In accordance with IUCN's categorisation of world natural heritage, the candidate site of Mount Sanqingshan falls into the category of mountain heritage. This means that key references to assist with the comparative analysis are IUCN's working papers such as A Global Overview of Mountain Protected Areas on the World Heritage List (2002), Geological World Heritage: A Global Framework (2005), and The World Heritage List: Guidelines and Future Priorities for Identifying Natural Heritage of Potential Outstanding Universal Value (2006).

3.c-1 Comparison with Similar Properties

By 2006, a total of 160 natural sites and 24 mixed sites had been inscribed on the World Heritage List, of which some 57 sites could be classed as 'Mountain World Heritage Site' (Table 3.1). These sites have 'outstanding universal value' because they demonstrate the most significant 'natural phenomena and natural beauty' (criterion vii), 'geological processes' (criterion viii), 'ecological and biological processes' (criterion ix), and 'biodiversity' (criterion x) of the earth.

Table 3.1 Existing Mountain World Heritage Sites

| |
|--|
| ARGENTINA |
| 1) Los Glaciares (N ii, iii/ 1981) |
| The Los Glaciares National Park is an area of exceptional natural beauty, with rugged, towering mountains and numerous glacial lakes, including Lake Argentino, which is 160 km long. At its farthest end, three glaciers meet to dump their effluvia into the milky grey glacial water, launching massive igloo icebergs into the lake with thunderous splashes. |
| 2) Ischigualasto - Talampaya Natural Parks (N i/ 2000) |
| These two contiguous parks, extending over 275,300 ha in the desert region on the western border of the Sierra Pampeanas of central Argentina, contain the most complete continental fossil record known from the Triassic Period (245-208 million years ago). Six geological formations in the parks contain fossils of a wide range of ancestors of mammals, dinosaurs and plants revealing the evolution of vertebrates and the nature of palaeo-environments in the Triassic Period. |
| AUSTRALIA |
| 3) Tasmanian Wilderness (N i, ii, iii, iv / C iii, iv, vi/ 1982,1989) |

Continued table 3.1 Existing Mountain World Heritage Sites

In a region that has been subjected to severe glaciation, these parks and reserves, with their steep gorges, covering an area of over 1 million ha, constitute one of the last expanses of temperate rainforest in the world. Remains found in limestone caves attest to the human occupation of the area for more than 20,000 years.

4) Heard and McDonald Islands (N i, ii/ 1997)

Heard Island and McDonald Islands are located in the Southern Ocean, approximately 1,700 km from the Antarctic continent and 4,100 km south-west of Perth. As the only volcanically active subantarctic islands they 'open a window into the earth', thus providing the opportunity to observe ongoing geomorphic processes and glacial dynamics. The distinctive conservation value of Heard and McDonald - one of the world's rare pristine island ecosystems - lies in the complete absence of alien plants and animals, as well as human impact.

BULGARIA

5) Pirin National Park (N i, ii, iii/ 1983)

Extending over an area of 27,400 ha. and lying at an altitude of 1,008-2,914 m in the Pirin mountains, in south-west Bulgaria, Pirin National Park has a limestone Balkan landscape, with lakes, waterfalls, caves and pine forests. The rugged mountains, with some 70 glacial lakes scattered throughout them, are home to hundreds of endemic and rare species, many of which are representative of the Balkan Pleistocene flora. The mountains also have diverse and unique landscapes of great aesthetic value.

CANADA

6) Nahanni National Park (N ii, iii/ 1978)

Located along the South Nahanni River, one of the most spectacular wild rivers in North America, this park contains deep canyons and huge waterfalls, as well as a unique limestone cave system. The park is also home to animals of the boreal forest, such as wolves, grizzly bears and caribou. Dall's sheep and mountain goats are found in the park's alpine environment.

7) Canadian Rocky Mountain Parks (N i, ii, iii/ 1984, 1990)

The contiguous national parks of Banff, Jasper, Kootenay and Yoho, as well as the Mount Robson, Mount Assiniboine and Hamber provincial parks, studded with mountain peaks, glaciers, lakes, waterfalls, canyons and limestone caves, form a striking mountain landscape. The Burgess Shale fossil site, well known for its fossil remains of soft-bodied marine animals, is also found there.

CANADA and THE UNITED STATES OF AMERICA

8) Kluane/Wrangell-St Elias/Glacier Bay/Tatshenshini-Alsek (N ii, iii, iv/ 1979, 1992, 1994)

These parks comprise an impressive complex of glaciers and high peaks on both sides of the border between Canada (Yukon Territory and British Columbia) and the United States (Alaska). The spectacular natural landscapes are home to many grizzly bears, caribou and Dall's sheep. The site contains the largest non-polar icefield in the world.

9) Waterton Glacier International Peace Park (N ii, iii/ 1995)

In 1932 Waterton Lakes National Park (Alberta, Canada) was combined with the Glacier National Park (Montana, United States) to form the world's first International Peace Park. Situated on the border between the two countries and offering outstanding scenery, the park is exceptionally rich in plant and mammal species as well as prairie, forest, and alpine and glacial features.

CHINA

10) Mount Huangshan (N iii, iv / C ii/ 1990)

Huangshan, known as 'the loveliest mountain of China', was acclaimed through art and literature during a good part of Chinese history (e.g. the Shanshui 'mountain and water' style of the mid-16th century). Today it holds the same fascination for visitors, poets, painters and photographers who come on pilgrimage to the site, which is renowned for its magnificent scenery made up of many granite peaks and rocks emerging out of a sea of clouds.

Continued table 3.1 Existing Mountain World Heritage Sites

11) Jiuzhaigou Valley Scenic and Historic Interest Area (N iii/ 1992)

Stretching over 72,000 ha in the northern part of Sichuan Province, the jagged Jiuzhaigou valley reaches a height of more than 4,800 m, thus comprising a series of diverse forest ecosystems. Its superb landscapes are particularly interesting for their series of narrow conic karst land forms and spectacular waterfalls. Some 140 bird species also inhabit the valley, as well as a number of endangered plant and animal species, including the giant panda and the Sichuan takin.

12) Huanglong Scenic and Historic Interest Area (N iii/ 1992)

Situated in the north-west of Sichuan Province, the Huanglong valley is made up of snow-capped peaks and the easternmost of all the Chinese glaciers. In addition to its mountain landscape, diverse forest ecosystems can be found, as well as spectacular limestone formations, waterfalls and hot springs. The area also has a population of endangered animals, including the giant panda and the Sichuan golden snub-nosed monkey.

13) Mount Emei Scenic Area, including Leshan Giant Buddha Scenic Area (N iv / C iv, vi/ 1996)

The first Buddhist temple in China was built here in Sichuan Province in the 1st century A.D. in very beautiful surroundings atop Mount Emei. The addition of other temples turned the site into one of Buddhism's main holy places. Over the centuries, the cultural treasures grew in number. The most remarkable was the Giant Buddha of Leshan, carved out of a hillside in the 8th century and looking down on the confluence of three rivers. At 71 m high, it is the largest Buddha in the world. Mount Emei is also notable for its very diverse vegetation, ranging from subtropical to subalpine pine forests. Some of the trees are more than 1,000 years old.

14) Mount Wuyi (N iii, iv / C iii, vi/ 1999)

Mount Wuyi is the most outstanding area for biodiversity conservation in south-east China and a refuge for a large number of ancient, relict species, many of them endemic to China. The serene beauty of the dramatic gorges of the Nine Bend River, with its numerous temples and monasteries, many now in ruins, provided the setting for the development and spread of neo-Confucianism, which has been influential in the cultures of East Asia since the 11th century. In the 1st century B.C. a large administrative capital was built at nearby Chengcun by the Han dynasty rulers. Its massive walls enclose an archaeological site of great significance.

COSTARICA**15) Guanacaste Conservation Area (N (ii) (iv)/ 1999)**

The Area de Conservación Guanacaste contains important natural habitats for the conservation of biological diversity, including the best dry forest habitats from Central America to northern Mexico and key habitats for endangered or rare plant and animal species. The site demonstrates significant ecological processes in both its terrestrial and marine-coastal environments.

COSTA RICA and PANAMA**16) Talamanca Range-La Amistad Reserves/ La Amistad National Park (N i, ii, iii, iv/ 1983, 1990)**

The location of this unique site in Central America, where Quaternary glaciers have left their mark, has allowed the fauna and flora of North and South America to interbreed. Tropical rainforests cover most of the area. Four different Indian tribes inhabit this property, which benefits from close cooperation between Costa Rica and Panama.

DEMOCRATIC REPUBLIC of the CONGO**17) Virunga National Park (N ii, iii, iv/ 1979)**

Virunga National Park (covering an area of 790,000 ha) comprises an outstanding diversity of habitats, ranging from swamps and steppes to the snowfields of Rwenzori at an altitude of over 5,000 m, and from lava plains to the savannahs on the slopes of volcanoes. Mountain gorillas are found in the park, some 20,000 hippopotamuses live in the rivers and birds from Siberia spend the winter there.

Continued table 3.1 Existing Mountain World Heritage Sites

18) Kahuzi-Biega National Park (N iv/ 1980)

A vast area of primary tropical forest dominated by two spectacular extinct volcanoes, Kahuzi and Biega, the park has a diverse and abundant fauna. One of the last groups of mountain gorillas (consisting of only some 250 individuals) lives at between 2,100 and 2,400 m above sea-level.

ECUADOR**19) Galápagos Islands (N i, ii, iii, iv/ 1978, 2001)**

Situated in the Pacific Ocean some 1,000 km from the South American continent, these nineteen islands and the surrounding marine reserve have been called a unique 'living museum and showcase of evolution'. Ongoing seismic activity and volcanism reflect the processes that formed the islands. Located at the confluence of three oceanic currents, the Galápagos is a 'melting pot' of marine species. These processes, together with the extreme isolation of the islands, led to the development of unusual animal life-such as the land iguana, the giant tortoise and the many types of finch-that inspired Charles Darwin's theory of evolution following his visit in 1835.

20) Sangay National Park (N ii, iii, iv/ 1983)

With its outstanding natural beauty and two active volcanoes, the park illustrates the entire spectrum of ecosystems, ranging from tropical rainforests to glaciers, with striking contrasts between the snowcapped peaks and the forests of the plains. Its isolation has encouraged the survival of indigenous species such as the mountain tapir and the Andean condor.

ETHIOPIA**21) Simen National Park (N iii, iv/ 1978)**

Massive erosion over the years on the Ethiopian plateau has created one of the most spectacular landscapes in the world, with jagged mountain peaks, deep valleys and sharp precipices dropping some 1,500 m. The park is home to some extremely rare animals such as the Gelada baboon, the Simen fox and the Walia ibex, a goat found nowhere else in the world.

FRANCE and SPAIN**22) Pyrénées - Mont Perdu (N i, iii/ C iii, iv, v/ 1997, 1999)**

This outstanding mountain landscape, which spans the contemporary national borders of France and Spain, is centred around the peak of Mount Perdu, a calcareous massif that rises to 3,352 m. The site, with a total area of 30,639 ha, includes two of Europe's largest and deepest canyons on the Spanish side and three major cirque walls on the more abrupt northern slopes with France, classic presentations of these geological landforms. The site is also a pastoral landscape reflecting an agricultural way of life that was once widespread in the upland regions of Europe but now survives only in this part of the Pyrénées. Thus it provides exceptional insights into past European society through its landscape of villages, farms, fields, upland pastures and mountain roads.

GREECE**23) Mount Athos (N iii / C i, ii, iv, v, vi/ 1988)**

An Orthodox spiritual centre since 1054, Mount Athos has enjoyed an autonomous statute since Byzantine times. The 'Holy Mountain', which is forbidden to women and children, is also a recognized artistic site. The layout of the monasteries (about 20 of which are presently inhabited by some 1,400 monks) had an influence as far afield as Russia, and its school of painting influenced the history of Orthodox art.

INDIA**24) Nanda Devi National Park (N iii, iv/ 1988)**

The Nanda Devi National Park is one of the most spectacular wilderness areas in the Himalayas. It is dominated by the peak of Nanda Devi, which rises to over 7,800 m. No humans live in the park, which has remained more or less intact because of its inaccessibility. It is the habitat of several endangered mammals, especially the snow leopard, Himalayan musk deer and bharal.

Continued table 3.1 Existing Mountain World Heritage Sites

INDONESIA**25) Lorentz National Park (N i, ii, iv/ 1999)**

Lorentz National Park (2.5 million ha) is the largest protected area in South-East Asia. It is the only protected area in the world to incorporate a continuous, intact transect from snowcap to tropical marine environment, including extensive lowland wetlands. Located at the meeting-point of two colliding continental plates, the area has a complex geology with ongoing mountain formation as well as major sculpting by glaciation. The area also contains fossil sites which provide evidence of the evolution of life on New Guinea, a high level of endemism and the highest level of biodiversity in the region.

JAPAN**26) Shirakami-Sanchi (N ii/ 1993)**

Situated in the mountains of northern Honshu, this trackless site includes the last virgin remains of the cool-temperate forest of Siebold's beech trees that once covered the hills and mountain slopes of northern Japan. The black bear, the serow and 87 species of birds can be found in this forest.

KENYA**27) Mount Kenya National Park/Natural Forest (N ii, iii/1997)**

At 5,199 m, Mount Kenya is the second highest peak in Africa. It is an ancient extinct volcano, during whose period of activity (3.1-2.6 million years ago) it is thought to have risen to 6,500 m. There are 12 remnant glaciers on the mountain, all receding rapidly, and four secondary peaks that sit at the head of the U-shaped glacial valleys. With its rugged glacier-clad summits and forested middle slopes, Mount Kenya is one of the most impressive landscapes in East Africa. The evolution and ecology of its afroalpine flora also provide an outstanding example of ecological processes.

MALAYSIA**28) Kinabalu Park (N ii, iv/ 2000)**

Kinabalu Park, in the State of Sabah on the northern end of the island of Borneo, is dominated by Mount Kinabalu (4,095 m), the highest mountain between the Himalayas and New Guinea. It has a very wide range of habitats, from rich tropical lowland and hill rainforest to tropical mountain forest, sub-alpine forest and scrub on the higher elevations. It has been designated as a Centre of Plant Diversity for Southeast Asia and is exceptionally rich in species with examples of flora from the Himalayas, China, Australia, Malaysia, as well as pan-tropical flora.

29) Gunung Mulu National Park (N i, ii, iii, iv/ 2000)

Important both for its high biodiversity and for its karst features, Gunung Mulu National Park, on the island of Borneo in the State of Sarawak, is the most studied tropical karst area in the world. The 52,864-ha park contains 17 vegetation zones, exhibiting some 3,500 species of vascular plants. Its palm species are exceptionally rich, with 109 species in 20 genera noted. The park is dominated by Gunung Mulu, a 2,377 m-high sandstone pinnacle. At least 295 km of explored caves provide a spectacular sight and are home to millions of cave swiftlets and bats. The Sarawak Chamber, 600 m by 415 m and 80 m high, is the largest known cave chamber in the world.

NEPAL**30) Sagarmatha National Park (N iii/ 1979)**

Sagarmatha is an exceptional area with dramatic mountains, glaciers and deep valleys, dominated by Mount Everest, the highest peak in the world (8,848 m). Several rare species, such as the snow leopard and the lesser panda, are found in the park. The presence of the Sherpas, with their unique culture, adds further interest to this site.

Continued table 3.1 Existing Mountain World Heritage Sites

NEW ZEALAND**31) Te Wahipounamu - South-West New Zealand (N i, ii, iii, iv/ 1990)**

The landscape in this park, situated in south-west New Zealand, as been shaped by successive glaciations into fjords, rocky coasts, towering cliffs, lakes and waterfalls. Two-thirds of the park is covered with southern beech and podocarps, some of which are over 800 years old. The kea, the only alpine parrot in the world, lives in the park, as does the rare and endangered takahe, a large flightless bird.

32) Tongariro National Park (N ii, iii / C vi/ 1990, 1993)

In 1993 Tongariro became the first property to be inscribed on the World Heritage List under the revised criteria describing cultural landscapes. The mountains at the heart of the park have cultural and religious significance for the Maori people and symbolize the spiritual links between this community and its environment. The park has active and extinct volcanoes, a diverse range of ecosystems and some spectacular landscapes.

NIGER**33) Air and Ténéré Natural Reserves (N ii, iii, iv/ 1991)**

This is the largest protected area in Africa, covering some 7.7 million ha, though the area considered a protected sanctuary constitutes only one-sixth of the total area. It includes the volcanic rock mass of the Aïr, a small Sahelian pocket, isolated as regards its climate and flora and fauna, and situated in the Saharan desert of Ténéré. The reserves boast an outstanding variety of landscapes, plant species and wild animals.

PANAMA**34) Darien National Park (N ii, iii, iv/ 1981)**

Forming a bridge between the two continents of the New World, Darien National Park contains an exceptional variety of habitats - sandy beaches, rocky coasts, mangroves, swamps, and lowland and upland tropical forests containing remarkable wildlife. Two Indian tribes live in the park.

PERU**35) Historic Sanctuary of Machu Picchu (N ii, iii / C i, iii/ 1983)**

Machu Picchu stands 2,430 m above sea-level, in the middle of a tropical mountain forest, in an extraordinarily beautiful setting. It was probably the most amazing urban creation of the Inca Empire at its height; its giant walls, terraces and ramps seem as if they have been cut naturally in the continuous rock escarpments. The natural setting, on the eastern slopes of the Andes, encompasses the upper Amazon basin with its rich diversity of flora and fauna.

36) Huascaṛán National Park (N ii, iii/ 1985)

Situated in the Cordillera Blanca, the world's highest tropical mountain range, Mount Huascaṛán rises to 6,768 m above sea-level. The deep ravines watered by numerous torrents, the glacial lakes and the variety of the vegetation make it a site of spectacular beauty. It is the home of such species as the spectacled bear and the Andean condor.

37) Manu National Park (N ii, iv/ 1987)

This huge 1.5 million-ha park has successive tiers of vegetation rising from 150m to 4,200m above sealevel. The tropical forest in the lower tiers is home to an unrivalled variety of animal and plant species. Some 850 species of birds have been identified and rare species such as the giant otter and the giant armadillo also find refuge there. Jaguars are often sighted in the park.

38) Río Abiseo National Park (N ii, iii, iv / C iii/ 1990, 1992)

The park was created in 1983 to protect the fauna and flora of the rainforests that are characteristic of this region of the Andes. There is a high level of endemism among the fauna and flora found in the park. The yellow-tailed woolly monkey, previously thought extinct, is found only in this area. Research undertaken since 1985 has already uncovered previously unknown archaeological sites at altitudes of between 2,500m and 4,000m, which give a good picture of pre-Inca society.

Continued table 3.1 Existing Mountain World Heritage Sites

RUSSIAN FEDERATION**39) Virgin Komi Forests (N ii, iii/ 1995)**

The Virgin Komi Forests cover 3.28 million ha of tundra and mountain tundra in the Urals, as well as one of the most extensive areas of virgin boreal forest remaining in Europe. This vast area of conifers, aspens, birches, peat bogs, rivers and natural lakes has been monitored and studied for over 50 years. It provides valuable evidence of the natural processes affecting biodiversity in the taiga.

40) Volcanoes of Kamchatka (N i, ii, iii, iv/ 1996, 2001)

This is one of the most outstanding volcanic regions in the world, with a high density of active volcanoes, a variety of types, and a wide range of related volcanic features. The six sites included in the serial designation group together the majority of volcanic features of the Kamchatka peninsula. The interplay of volcanism with active glaciers forms a dynamic landscape of great beauty. The sites contain high species diversity, including the world's greatest known variety of salmonoid fish and exceptional concentrations of sea otter, brown bear and Stellar's sea eagle.

41) Lake Baikal (N i, ii, iii, iv/ 1996)

Situated in south-east Siberia, the 3.15-million-ha. Lake Baikal is the oldest (25 million years) and deepest (1,700 m) lake in the world. It contains 20% of the world's total unfrozen freshwater reserve. Known as the 'Galapagos of Russia', its age and isolation have produced one of the world's richest and most unusual freshwater faunas, which is of exceptional value to evolutionary science.

42) Golden Mountains of Altai (N iv/ 1998)

The Altai mountains in southern Siberia form the major mountain range in the western Siberia biogeographic region and provide the source of its greatest rivers - the Ob and the Irtysh. Three separate areas are inscribed: Altaisky Zapovednik and a buffer zone around Lake Teletskoye; Katunsky Zapovednik and a buffer zone around Mount Belukha; and the Ukok Quiet Zone on the Ukok plateau. The total area covers 1,611,457 ha. The region represents the most complete sequence of altitudinal vegetation zones in central Siberia, from steppe, forest-steppe, mixed forest, subalpine vegetation to alpine vegetation. The site is also an important habitat for endangered animal species such as the snow leopard.

43) Western Caucasus (N ii, iv/ 1999)

The Western Caucasus, extending over 275,000 ha of the extreme western end of the Caucasus mountains and located 50 km north-east of the Black Sea, is one of the few large mountain areas of Europe that has not experienced significant human impact. Its subalpine and alpine pastures have only been grazed by wild animals, and its extensive tracts of undisturbed mountain forests, extending from the lowlands to the subalpine zone, are unique in Europe. The site has a great diversity of ecosystems, with important endemic plants and wildlife, and is the place of origin and reintroduction of the mountain subspecies of the European bison.

44) Central Sikhote-Alin (N iv/ 2001)

The Sikhote-Alin mountain range contains one of the richest and most unusual temperate forests of the world. In this mixed zone between taiga and subtropics, southern species such as the tiger and Himalayan bear cohabit with northern species such as the brown bear and lynx. The site stretches from the peaks of Sikhote-Alin to the Sea of Japan and is important for the survival of many endangered species such as the Amur tiger.

SOUTH AFRICA**45) Khahlamba / Drakensberg Park (N iii, iv / C i, iii/ 2000)**

The uKhahlamba - Drakensberg Park has exceptional natural beauty in its soaring basaltic buttresses, incisive dramatic outbacks, and golden sandstone ramparts. Rolling high altitude grasslands, the pristine steep-sided river valleys and rocky gorges also

Continued table 3.1 Existing Mountain World Heritage Sites

contribute to the beauty of the site. The site's diversity of habitats protects a high level of endemic and globally threatened species, especially birds and plants. This spectacular natural also contains many caves and rock-shelters with the largest and most concentrated group of paintings in Africa south of the Sahara, made by the San people over a period of 4,000 years. The rock paintings are outstanding in quality and diversity of subject and in their depiction of animals and human beings. They represent the spiritual life of the San people who no longer live in this region.

SWITZERLAND**46) Jungfrau-Aletsch-Bietschhorn (N i, ii, iii/ 2001)**

This is the most glaciated part of the Alps, containing Europe's largest glacier and a range of classic glacial features such as U-shaped valleys, cirques, horn peaks and moraines. It provides an outstanding geological record of the uplift and compression that formed the High Alps. The diversity of flora and wildlife is represented in a range of Alpine and sub-Alpine habitats and plant colonization in the wake of retreating glaciers provides an outstanding example of plant succession. The impressive vista of the North Wall of the High Alps, centred on the Eiger, Manch and Jungfrau peaks, has played an important role in European art and literature.

UGANDA**47) Rwenzori Mountains National Park (N iii, iv/ 1994)**

Covering nearly 100,000 ha in western Uganda, the park comprises the main part of the Rwenzori mountain chain, which includes Africa's third highest peak (Mount Margherita: 5,109 m). The region's glaciers, waterfalls and lakes make it one of Africa's most beautiful alpine areas. The park has many natural habitats of endangered species and a rich and unusual flora comprising, among other species, the giant heather.

UNITED REPUBLIC OF TANZANIA**48) Kilimanjaro National Park (N iii/ 1987)**

At 5,963 m, Kilimanjaro is the highest point in Africa. This volcanic massif stands in splendid isolation above the surrounding plains, with its snowy peak looming over the savannah. The mountain is encircled by mountain forest. Numerous mammals, many of them endangered species, live in the park.

UNITED STATES OF AMERICA**49) Yellowstone (N i, ii, iii, iv/ 1978)**

The vast natural forest of Yellowstone National Park covers nearly 9,000 sq. km; 96% of the park lies in Wyoming, 3% in Montana and 1% in Idaho. Yellowstone contains half of all the world's known geothermal features, with more than 10,000 examples. It also has the world's largest concentration of geysers (more than 300 geysers, or 2/3 of all those on the planet). Established in 1872, Yellowstone is equally known for its wildlife, such as grizzly bears, wolves, bison and wapitis.

50) Grand Canyon National Park (N i, ii, iii, iv/ 1979)

Carved out by the Colorado river, the Grand Canyon (nearly 1,500 m deep) is the most spectacular gorge in the world. Located in the state of Arizona, it cuts across the Grand Canyon National Park. Its horizontal strata retrace the geological history of the past 2 billion years. There are also prehistoric traces of human adaptation to a particularly harsh environment.

51) Olympic National Park (N ii, iii/ 1981)

Located in the north-west of Washington State, Olympic National Park is renowned for the diversity of its ecosystems. Glacier-clad peaks interspersed with extensive alpine meadows are surrounded by an extensive old growth forest, among which is the best example of intact and protected temperate rainforest in the Pacific Northwest. Eleven major river systems drain the Olympic mountains, offering some of the best habitat for anadromous fish species in the country. The park also includes 100 km of wilderness coastline, the longest undeveloped coast in the contiguous United States, and is rich in native and endemic animal and plant species, including critical populations of the endangered northern spotted owl, marbled murrelet and bull trout.

Continued table 3.1 Existing Mountain World Heritage Sites

52) Great Smoky Mountains National Park (N i, ii, iii, iv/ 1983)

Stretching over more than 200,000 ha., this exceptionally beautiful park is home to more than 3,500 plant species, including almost as many trees (130 natural species) as in all of Europe. Many endangered animal species are also found there, including what is probably the greatest variety of salamanders in the world. Since the park is relatively untouched, it gives an idea of temperate flora before the influence of humankind.

53) Yosemite National Park (N i, ii, iii/ 1984)

Yosemite National Park lies in the heart of California. With its 'hanging' valleys, many waterfalls, cirque lakes, polished domes, moraines and U-shaped valleys, it provides an excellent overview of all kinds of granite relief fashioned by glaciation. At 600- 4,000 m, a great variety of flora and fauna can also be found here.

54) Hawaii Volcanoes National Park (N ii/ 1987)

Two of the most active volcanoes in the world, Mauna Loa (4,170 m high) and Kilauea (1,250 m high), tower over the Pacific Ocean at this site. Volcanic eruptions have created a constantly changing landscape, and the lava flows reveal surprising geological formations. Rare birds and endemic species can be found there, as well as forests of giant ferns.

VENEZUELA**55) Canaima National Park (N i, ii, iii, iv/ 1994)**

Canaima National Park is spread over 3 million ha. in south- eastern Venezuela along the border between Guyana and Brazil. Roughly 65% of the park is covered by table mountain (tepui) formations. The tepuis constitute a unique biogeological entity and are of great geological interest. The sheer cliffs and waterfalls, including the world's highest (1,000 m), form a spectacular landscape.

CHINA**56) Three Parallel Rivers of Yunnan Protected Areas (N i, ii, iii, iv/ 2003)**

Consisting of eight geographical clusters of protected areas within the boundaries of the Three Parallel Rivers National Park, in the mountainous north-west of Yunnan Province, the 1.7 million hectare site features sections of the upper reaches of three of the great rivers of Asia: the Yangtze (Jinsha), Mekong and Salween run roughly parallel, north to south, through steep gorges which, in places, are 3,000 m deep and are bordered by glaciated peaks more than 6,000 m high. The site is an epicentre of Chinese biodiversity. It is also one of the richest temperate regions of the world in terms of biodiversity.

57) Sichuan Giant Panda Sanctuaries (N x/ 2006)

Sichuan Giant Panda Sanctuaries, home to more than 30% of the world's highly endangered pandas, covers 924,500 ha with seven nature reserves and nine scenic parks in the Qionglai and Jiajin Mountains. The sanctuaries constitute the largest remaining contiguous habitat of the giant panda, a relict from the paleo-tropic forests of the Tertiary Era. It is also the species' most important site for captive breeding. The sanctuaries are home to other globally endangered animals such as the red panda, the snow leopard and clouded leopard. They are among the botanically richest sites of any region in the world, outside the tropical rain forests, with between 5,000 and 6,000 species of flora in over 1,000 genera.

(i) Natural beauty and aesthetic values

Of the inscribed mountain heritage sites, 34 sites satisfy Criterion (vii) as having exceptional natural beauty and aesthetic importance. Mount Sanqingshan is unique and significant because of it has one of the world's richest and most unusual granite mountain landscapes. It clearly differs from mountains of non-granite rock, such as Mt Wuyishan, Mt Emeishan ,etc. It also differs from mountains which have been glaciated in the past such as the Yosemite National Park, or are currently glaciated, such as the Canadian Rocky Mountain Parks, etc. The unusual natural beauty of the Mount Sanqingshan is immediately recognisable, it lies not only in its rich and spectacular granite pillars and peak clusters, but also in its unique combination of granite landform, trees, cloud and water. According to Prof. Tim Kusky of St. Louis University "Sanqing Mountain presents a stunning array of natural beauty integrating primeval landscapes and pristine flora, unequalled in the western Pacific. Its granite landforms tease the mind with unique blends of naturally shaped landforms, beautiful trees and forests and relics of the Taoist culture." With similar sentiment, Prof. Piotr Migon of Wroclaw University has stated "Focusing on granite, few if any other world sites can rival Sanqingshan in terms of grandeur, majesty and phantasy of Mother Nature ."

Mount Sanqingshan also has important national aesthetic and religious significances. As a great natural spectacle, it has been eulogized for hundreds of years in China. Its linkage with the Chinese Taoism dates back to as early as the 4th century and some important early Taoist architectures are preserved here.

(ii) Earth science values

Of the inscribed mountain heritage sites, there are 20 sites satisfying Criterion (viii) as having outstanding universal value for their earth science importance. With respect to the Operational Guidelines and IUCN working papers, there are four aspects of Criterion (viii): (a) Earth history; (b) Record of life; (c) Significant on-going geological processes in the development of landforms; and (d) Significant geomorphic or physiographic features. These 4 aspects are specifically assigned to 13 themes. In this respect, Mount Sanqingshan meets Criterion (viii) primarily from the aspects of (a) Earth history and (d) Significant geomorphic or physiographic features that are embodied in the themes of (1) Tectonic and structural features and (3) Mountain systems.

Compared with other inscribed mountain world heritage sites, Mount Sanqingshan is unique and significant because its complex granitic rock sequence and associated geological and structural features evolved over such a long geological period (since the Neoproterozoic Era - a period of over 1 billion years). The mountain and its geology is therefore testimony to many important geological events, such as the formation of the Rodinia supercontinent in the Neoproterozoic; the continent rifting and formation of the Palaeo-Asian continent; the formation of the Eurasia continent. Few areas in the world have such a rich and complex granitic rock sequence and geological setting as Mount Sanqingshan that demonstrate such a long geological history.

1 billion years of geological evolution

The nominated property lies within the Suzhou-Dexing supercrustal Fracture Zone, a narrow elongated area of the earth's crust that marks the collision of two Neoproterozoic lithospheric plates and the subsequent geological activity related to this crustal weakness. The geological history encapsulated in and around the nominated property spans over 1 billion years, and in addition to the site providing an almost continuous record over this great length of time, it provides evidence of some of the most significant world-wide geological events. For example, the formation and subsequent break-up of the Rodinia supercontinent and later Mesozoic intracontinental subduction, the Nanhua or Cryogenian (750-600 Ma.) glaciation (the so-called 'Snowball Earth' event), the emplacement of granites, the important physical and biological events of the early Palaeozoic, rock facies indicative of alternating periods of orogenesis and crustal uplift and extension.

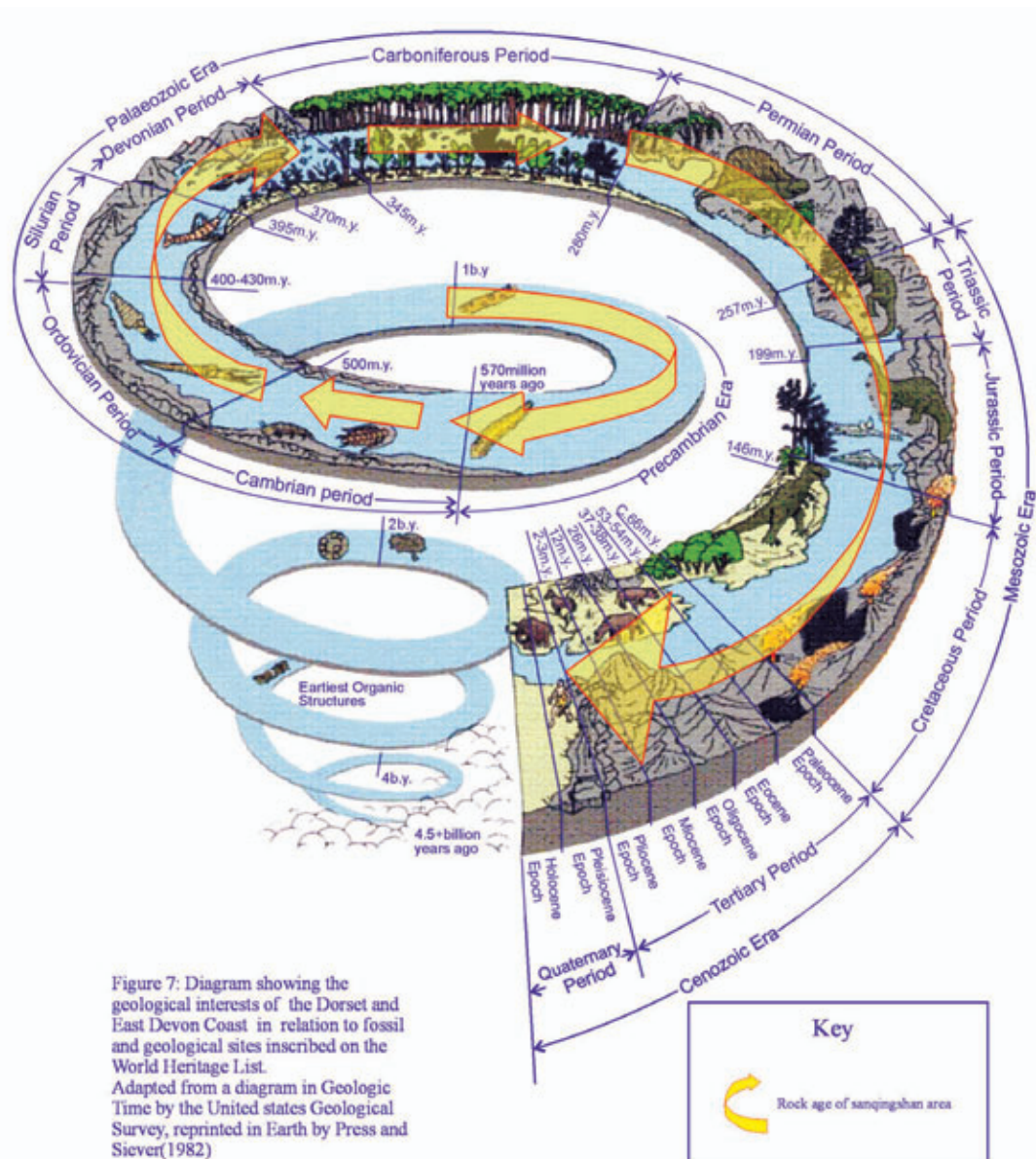


Fig. 3.2 Geological time represented in the nominated property compared with that of some existing geological World Heritage Sites

While there are sites throughout the world whose rocks similarly record long, continuous periods of the Earth's history, few have evidence confined in so small an area, have been studied in such detail, or record as long or as early a span of geological time as the nomination property. Fig. 3.2 illustrates the length of geological time recorded in the rocks of the nomination area against that of some existing World Heritage Sites. The figure also indicates the position in geological time of the major geological events recorded in the candidate site.

Granite emplacement

There are few countries in the world that do not have outcrops of granitic rocks (or granitoids), and granites occupy approximately 15% of the Earth's surface. However, very few of these granites have been studied in such detail or hold such important evidence of local tectonic-magmatic developments as the granites of Mount Sanqingshan. The granite batholiths forming the Huaiyu mountain range, of which Sanqingshan is a part, and the associated Lingshan Complex are S and A type granites of Cretaceous age (The Sanqingshan granite mass might be connected at depth with the Lingshan granite complex). Outside of the nomination area the Tongchang-Yinshan granite belt contains I type granite, also associated with Sanqingshan granite and located within the Suzhou-Dexing Supercrustal fracture zone.

The scientific distinctions between the I, S and A types of granites are important, because the final mineralogy, texture and chemical composition of a granite is often indicative of its origin. For example, an S (sedimentary protolith) type granite formed from melted surficial rocks will have more alkali feldspar, whereas an I (igneous protolith) type granite derived from melted rocks of the lower crust and upper mantle will be richer in plagioclase feldspar. On the other hand, A (anorogenic and/or anhydrous) type granites, are formed above hot-spot activity by melting of the lower crust, a process that usually occurs within rift zones and the intracontinental extension zone within stable continental blocks.

Identification and study of the different types of granites in and around the nomination property has therefore been fundamental to an understanding of the tectonic history of the area. The nomination property is particularly special because there is a variety of granites with different emplacement histories that occur within a relatively compact area, which is rarely seen in China. The granite of the nomination is particularly distinctive for it lies near to the Suzhou-Dexing Suture Zone. Such a complex and compact occurrence of granite emplacements is uncommon in other parts of the world and as a site for studying the emplacement of granites Sanqingshan has great importance. Whilst there are sites inscribed on the World Heritage List that have granitic bedrock, the origins and emplacement history of the granite have not been recorded as a special value on a single one. This nomination therefore stands distinct in claiming value in the occurrence and scientific interpretation of the Sanqingshan granites.

Nanhua Glaciations ('Snowball Earth')

The Nanhua or Cryogenian period, between 750-600 Ma., was characterised by some of the severest glaciations in the history of the Earth. In at least one of the three or more glaciations that gripped the planet during this period ice may have advanced as far south as the tropics and oceans may have been frozen to a depth of one or two kilometres. Some of the most important evidence of the Cryogenian glaciations has recently been discovered in South China, and in the nomination area during the late Nanhua period tillite and

other sedimentary deposits, together with striated bedrock, contribute to the spartan evidence of these world-wide events.

While glacial deposits and other evidence of the Cryogenian glacial events are present from sites scattered around the world (Canada, USA, Australia, Namibia, etc.), this important aspect of the Earth's history has not been recorded as a special feature of any other inscribed World Heritage Site.

Outstanding geomorphology

The principal feature that makes the nominated property stand out above all other granite mountain sites in the world is its outstanding and unusual granite geomorphology. This spectacular landscape was described in detail in Chapter 2, but in summary is one of towering granite peaks rising steeply to over 1800m, superimposed upon which is a range of subsidiary landforms (known collectively as “Peak Forest”) in the form of individual and clustered columns, fins, tors and rock bodies that have been naturally sculptured into uncannily lifelike forms. The extensive area covered by these features, their high density and the quality of form, give to the site international importance for its scientific interest and aesthetic impact.

China is a country with a considerable area of outcropping granitic rocks (Fig. 3.3), although because of varying regional climates, the different composition and origins of the granites and their distinctly different fracture patterns, none of the other granite mountains has as unusual and spectacular a landscape as Mt Sanqingshan. The value that China places on its granite landscapes is reflected in the designation of 43 National Geoparks of granite mountain type.

Furthermore, Chinese geologists have devised a typology of granite landscapes, the basis for identifying the

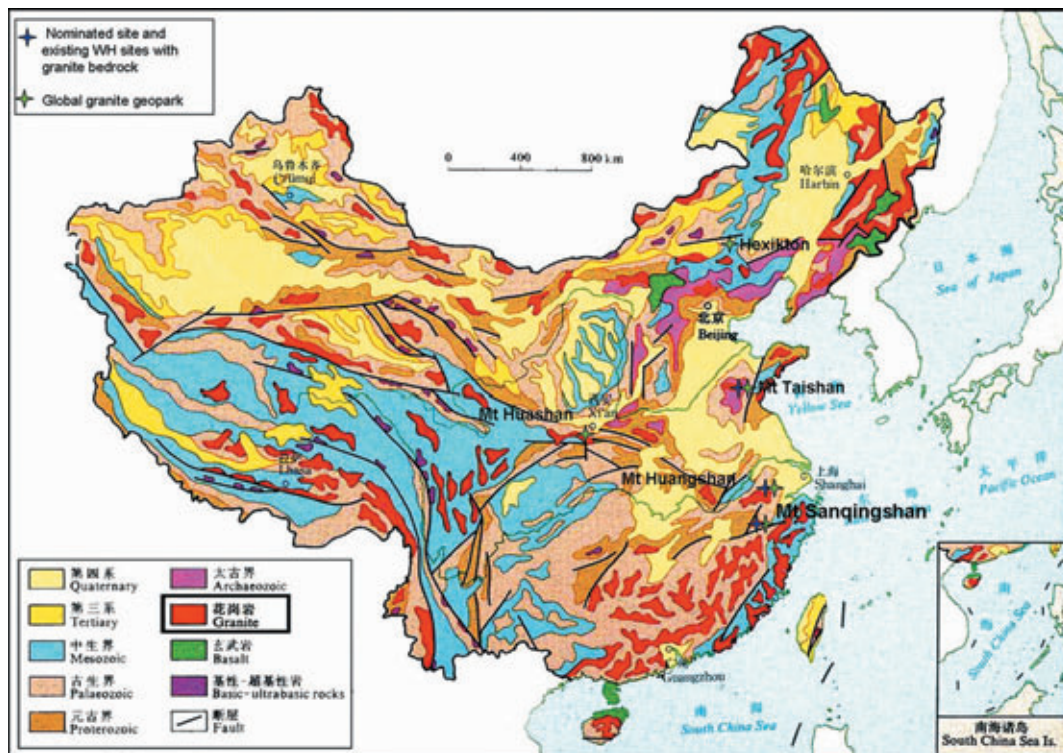


Fig. 3.3 Distribution of granite geological heritages in China

different landscape types being the range of factors that control their formation, including the chemistry, petrology and structural setting of the granite, the density of faults and joints, the intensity of weathering, the depth of erosion by fluvial activity, and the nature and scale of the landforms. Four genetic types have been identified for granite landscape.

Taishan type, named after Mt Taishan (1, 545m) in Shandong Province. This is an Archaean granite complex that has been subjected to relatively intensive chemical weathering, resulting in a round and thick mountain body, combined with steep slopes and cliffs. Its form has been termed ‘Majestic’.

Huashan type, named after Mt Huashan (2, 610m) in Shanxi Province. This mountain is composed of a Cretaceous adamellite that has been eroded by structurally controlled fluvial erosion, and minor chemical weathering, to provide a landscape of high peaks and sheer cliffs. Its form has been termed ‘Precipitous’.

Huangshan type, named after Mt Huangshan (1, 900m) in Anhui Province. This is a Cretaceous granite. The landforms were formed on the background of regional block uplift, producing a large area with precipitous relief and morphology comprising mainly of overlapped peaks with rounded or minor cone-like tops. The diversity of the relief is greater than that of the Huashan type, but not as great as the Sanqingshan type, mainly because the area was subjected to relatively intense chemical weathering and Quaternary glaciation. Medium to small landforms are thinly distributed.

Sanqingshan type, named after the nominated property (1, 816m) in Jiangxi Province. Like the Huangshan type, this mountain is formed of Cretaceous granite (moyite) and characterized by peak forest, but there is a much greater density, scale and diversity of the landforms on Sanqingshan. The peak forest landforms were formed on the back of the uplifted Huaiyu mountain range, the central part of which was further uplifted (‘uplift on uplift’) as a triangular-shaped block bounded by three normal faults. Shaping of the landscape was undertaken by structurally controlled fluvial erosion, assisted by weak chemical weathering. Compared with those of Mt Huangshan, the landforms of Sanqingshan are more numerous, systematically formed and complete.

Mount Sanqingshan therefore represents the most complex of the granite landscapes in China. Indeed, at the 1st International Symposium on Granite Geology and Geomorphology, held in Shangrao City in July, 2006, granite specialists from all over China and from overseas endorsed the view that Mount Sanqingshan has the best evolved and most spectacular granite landscape in China.

On a global scale, granite mountains abound in all shape and sizes. As well as forming the cores of the world’s great mountain ranges, granites form substantial parts of the world’s ancient cratons, or shields. Most commonly granite outcrops form upstanding relief because the rock is massive and usually more resistant to weathering and erosion than the rocks surrounding it. Mount Sanqingshan is even more prominent than most because of its unusual history of uplift (i.e. ‘uplift on uplift’) between three bounding normal faults.

The most commonly held images of granite landscapes are high, dome-shaped mountains, frequently with bare rock surfaces exposed over extensive area, such as in the Sierra Nevada, California. Yet, there are

many other forms of granite landscapes, depending upon the structural and climatic characteristics of the areas in which they occur. For example, there are many dome-shaped middle to low mountains, hills and aeolian iselbergs in China, but these do not devoid of granite peak forests. These vary from arid plains broken only by isolated hills, residual ranges and ridges in Africa, rolling uplands surmounted by rocky towers ('tors') in Europe and the great towering peaks of intensively glaciated landscapes, such in Patagonia or the Alps.

Perhaps the best known of all granite mountain landscapes is Yosemite National Park, California. Even though the mountains of the Sierra Nevada were deeply dissected by glacial erosion and subjected to mechanical weathering, tall serrated peaks are missing and massive granite has exfoliated in sheets to produce such famous dome-shaped mountains as Half-Dome and El Capitan. Yet, towering granite peaks and pinnacles are characteristics of other glaciated mountain ranges, and granite forms the core of some of the world's most inspiring mountains. For example, Europe's tallest mountain, Mt Blanc (4,807 m) is formed substantially of late Palaeozoic granite, while the awe-inspiring peaks of the Fitzroy Mountains in Los Glaciares National Park, Argentina, or the Torres del Paine, Patagonia, are superb examples of this type of landscape.

Notable granite mountains of the wet tropics are Mt Kinabalu (4,095m), Malaysia and Corcovado Mountain, overlooking Rio de Janeiro, Brazil. Both have domed forms, the latter being one of a number of separate granite domes in the area. Mt Kinabalu is the highest mountain in the tropics and its domal form is still being uplifted today. It is high enough to have spawned glaciers during the Quaternary, which dissected the mountain with deep valleys, left upstanding summit peaks and scoured and smoothed the surfaces of the mountain.

Associated with hot, arid or semi-arid climates, although not necessarily restricted to this climatic regime, granites have typically formed inselbergs (also known as bornhardts or kopje). These are isolated hills rising above an extensive plain. Such landforms are well developed in the Central Namib Desert, while the area of the Matabo Hills, Zimbabwe, is also noted for the density of its inselbergs, crenellated ridges and boulder trains. A similar landscape is to be found in the Granite Mountains of the Mojave National Preserve, California, while 'Castle Kopje' are a distinctive feature of Joshua Tree National Park, California. The Eyre Peninsula, South Australia, is also well-known for its abundance of inselbergs and other granite landforms.

These landscapes bear few similarities with that of Mount Sanqingshan and to find a closer comparison one must return to East Asia. Here, Mount Jinjang, Kumgangsan and Soraksan in Korea are possibly the closest in form to Sanqingshan, but although they have well-developed, deeply dissected granite mountain landscapes, they lack the density and scale of the peak forest found on Sanqingshan.

Granite sites inscribed on the World List

Despite the wealth of granite landscapes around the world there are few (just six) inscribed on the World Heritage List (the IUCN Publication Geological World Heritage: A Global Framework, does not identify granite mountains or landscapes as a category in its tables). According to the World Heritage List, the mountain heritage: Yosemite National Park, California; Los Glaciares National Park, Argentina; Kinabalu National Park, Malaysia are spectacular mountain sites that were inscribed on the basis of their natural

properties, including their granite geology, and in the case of Yosemite, its geomorphology.

In China, the granite mountains of Huangshan and Taishan were inscribed in respect of both their cultural and natural values. The only other granite site on the WH List is the Matabo Hills, Zimbabwe, inscribed because of its outstanding cultural heritage, but coincidentally located in a geomorphologically rich granite landscape.

A further way of distinguishing granite landscapes is on the basis of their geomorphology. Comment is made above about the typology of Chinese granite mountain landscapes, and Prof. Piotr Migon (2006) in his book *Granite Landscapes of the World* provides a tentative classification of nine principal morphogenetic types into which the granite landscapes of the world may be placed (Fig.3.4). While there are difficulties in trying to fit Mount Sanqingshan into any one of Migon's categories, the form of the mountain does certainly represent an 'All Slopes' terrain. Migon explains that there are granite terrains that may combine elements of the different morphogenetic types and while Sanqingshan may represent an All-Slopes topography, additionally it may have elements of a Dissected Plateau and Joint Valley topography. Certainly, the morphology of Sanqingshan is difficult to compare, because it is serrated, or dissected, without having been glaciated (although as explained previously, glaciation in other East Asia granite mountains may have stripped them of earlier-formed peak forest landforms) and it is presented on such a grand scale.

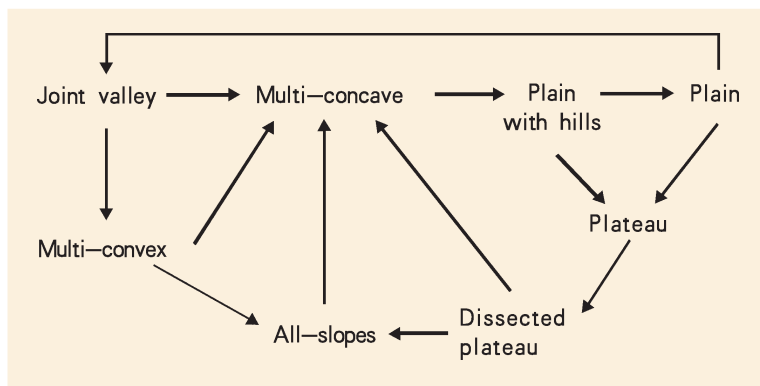


Fig. 3.4 Tentative pathways of granite landscape evolution (after Prof. Piotr Migon, 2006)

(iii) Biological and ecological values

In addition to its important geological and geomorphological values, Sanqingshan is an outstanding biological resource, with high biodiversity, including rare and endemic species. The tables below provide a comparison with other parts of China and the world, while Chapter 2a-5, with Figs. 2.6, 2.7, 2.8 and 2.9, provides a basis for evaluating the international importance of the nominated property for protection of disjunct and relict plant species.

Of the 57 inscribed mountain properties, 40 sites satisfy Criterion (ix) as having outstanding universal value for their important ecological and biological processes. Furthermore, 48 of the 57 mountain properties satisfy both Criteria (ix) and (x). Of these, 25 properties are located within the Palearctic Realm, while just 6 are located in the sub-tropical forest province to which Sanqingshan belongs.

In its evaluation of Biogeographical Provinces of Natural and Mixed World Heritage Sites, UNESCO (2002) identified the following sites in the Palearctic Realm. The biology of these sites therefore bears some comparison with that of Mount Sanqingshan, although the data held in this publication does not enable a deep comparison to be made.

- . Chinese temperate forest/ Oriental Deciduous Forest : Mount Taishan and Shirakami-Sanchi (Japan)
- . Chinese Subtropical Forest/Oriental Deciduous Forest: Mt Emei Scenic Area
- . Chinese Subtropical Forest/South China Rainforest : Mount Wuyi, Mount Huangshan and Wulingyuan Scenic Area

In addition, although in the zone of Japanese Evergreen Forest, Yakushima World Heritage Site is mainly a granite island, while sites recently inscribed which also have important plant and animal communities of the Palearctic Realm are the Sichuan Giant Panda Sanctuaries in the Qionglai and Jiayin mountains, and the Three Parallel Rivers of Yunnan Protected Areas.

Similarly IUCN's 1997 Global Overview of Forest Protected Areas on the World Heritage List names five sites within the Palearctic Realm in China.

- . Huanglong Scenic and Historic Interest Area
- . Jiuzhaigou Valley Scenic and Historic Interest Area
- . Mt Emei
- . Mt Huangshan
- . Mt Taishan

This list may be extended by including the two recently inscribed sites listed above. With an extensive, relatively untouched middle subtropic humid evergreen broadleaved forest and coniferous and broadleaved mixed forest, with many endangered, rare and relict species, Sanqingshan should also qualify for inclusion on this list.

Species diversity

Mt Sanqingshan is almost completely clothed with evergreen broad-leaved forest eco-system and a mountain temperate coniferous forest system of the middle subtropical zone. As such, as described in Chapter 2a, the nominated property has many rare and endangered endemic species and is rich in species diversity. In comparison with other notable granite sites, Mount Sanqingshan provides a protective environment for many kinds of animals and plants:

- . The diversity of the higher plants is far richer than on the existing granite World Heritage Sites of Mount Huangshan or Mount Taishan in China, the island of Yakushima in Japan and the Yosemite in the United States (Table 3.2).
- . It holds one of the greatest number of plant species in the sub-tropical zone of China.
- . It is the most important centre in the world for the growth, distribution and study of *Pseudotsuga* genus of the Pinaceae family and one of the most important centres for the protection and study of relict plants.
- . Of the high plants, Mount Sanqingshan has more than 300 endemic species, belonging to 19 genera endemic to China, of which 22 species are listed in the IUCN Species Red List (2003); 92 plants are listed in the appendices of CITES (Convention on International Trade of Endangered Species), 1995; 49 species are

inscribed in the China Species Red List (2004); 26 plants are under State-level key protection; 12 plants are relic species. Furthermore, the nominated property is the habitat of 38 animals endemic to China. 23 animals are listed in the IUCN Species Red List (2003); 54 are listed in the appendices of CITES (1995); 95 species are listed in China Species Red List (2004); 53 animals are under State-level Key Protection.

. There is a much richer variety of mammals, birds, reptiles and amphibians than that found in, for example, the Mount Huangshan World Heritage Site.

. The number of mammal species amounts to between 60% and 70% of the numbers in the neighbouring provinces of Zhejiang, Anhui, Fujian. For avifauna the figure is 41%-64%, reptiles 42%-72%, and amphibians 52%-59% (Tables 3.3, 3.4).

Relict species

The nominated property has 68 genera of the plants found in the disjunct distribution region of East Asia and North America, accounting for 56.2% of this type in China. This illustrates that Mount Sanqingshan not only provides the core of this East Asia and North America disjunct flora, but also one of the most important distributing centres in East Asia. Especially important, the growing area of *Pseudotsuga gaussenii* (533 ha.) is the largest in East China. Furthermore, the flourishing and stable community of *P. gaussenii* provides evidence that this was the source stock from which the North American *P. menziesii* evolved. Additionally, it is the most important place for undertaking studies on the origin of the Pinaceae families. Above all, Mount Sanqingshan has an extremely high eco-geographic value and holds outstanding evidence about plant evolution and the relationships between the paleogeography and palaeontology of East Asia and North America.

The particularity, rarity, and typicality of plant biodiversity

In the core zone of Mountain Sanqingshan, for example, West Coast and Gigantic Boa Valley, plant diversity, typical species and endemic species are rich and constitute plant community with various characteristics, which can be regarded as the species clearstory and ecological wander. In the west coast, the plank road built along a cliff, like the species clearstory, are distributed with all kinds of typical species in turn. At the lower altitude, *Rhododendron simiarum*, *Pseudotsuga gaussenii*, *Cyclobalanopsis glauca*, *Schima superba*, *Sorbus alnifolia*, *Lindera obtusiloba*, *Clethra barbinervis*, *Sorbus folgneri*, *Litsea cubeba*, *Eurya saxicola*, *Litsea coreana* are dominantly distributed. At the middle altitude, rare species are dominant, including *Torreya grandis*, *Magnolia cylindrica*, *Taxus mairei*, *Pseudotsuga gaussenii*, *Tsuga chinensis* var. *tchckiangensis*, *Fokienia hodginsii*, while at the higher altitude, *Pinus taiwanensis*, *Pseudotsuga gaussenii*, *Castanopsis sclerophylla*, *Viburnum sympodiale*, *Cleyera obscurinervis*, *Agapetes lacei*, *Clethra barbinervis* and *Yushania hirticaulis* are dominant species. In Python Valley, from Nanqingyuan to the valley in Jinshatan, rare species or endemic species of flora are covered, including *Disanthus cercidifolius* var. *longipes*, *Torreya grandis*, *Stewartia sinensis*, *Magnolia cylindrica*, *Exbucklandia tonkinensis*, *Corylopsis sinensis*, *Pseudotaxus chienii*, of which many belonged to East Asia-North America disjunction genera, included *Torreya grandis*, *Stewartia sinensis*, *Magnolia cylindrica*, *Magnolia sieboldii*, *Sassafras tzumu*, *Taxus mairei* var. *mairei*, *Illicium jiadifengpi*, *Itea chinensis* and *Halesia macgregorii*. As a whole of the region, rare plant communities are distributed in large area, such as the communities of *Pseudotaxus chienii*, *Pseudotsuga gaussenii*, *Disanthus cercidifolius* var. *longipes*, *Stewartia sinensis*, *Torreya grandis*,

Tsuga chinensis var. *tchekiangensis*, *Buxus sinica* var. *parvifolia*, *Illicium jiadifengpi* and *Liquidambar acalycina*, of which most belonged to East Asia-North America disjunct genera and ancient taxa. At the altitude ranged from 1,300 to 1,600, typical species in Hamamelidaceae, Magnoliaceae, Taxaceae and Theaceae families occur at a plot totaling about 1,200 to 1,600 m². These families are not only East Asia-North America disjunction families and the ancient taxa of Gymnospermae and Angiospermae, but also the typical species of flora in sub-tropical mountain of China. Therefore, it is out of question that Mount Sanqingshan is rich in the biodiversity in east of Chinese mainland, concentrated many specialties on its own, is a rare natural geography and resource with its particularity, rarity and typicality of plant biodiversity.

Table 3.2 Variety of higher plants compared with other sites

| Heritage site | Nominated Property | Huangshan | Taishan | Yakushima in Japan | Yosemite in USA |
|----------------|--------------------|-----------|---------|--------------------|-------------------------------|
| Species | 2,373 | 1,805 | 1,056 | 1,900 | 2,003 (Vascular plants, 1900) |
| Percentage (%) | 100.0 | 76.1 | 44.5 | 80.1 | 84.4 |

* Percentage of species relative to the number in the nominated property

Table 3.3 Variety of wild animals compared with other sites

| Site | Mammalia | | Aves | | Reptilia | | Amphibia | | Pisces | | Papilioe xuthus-Parnassius | |
|--------------------|----------|--------|-------|--------|----------|--------|----------|--------|--------|--------|-------------------------------|-------|
| | Types | % | Types | % | Types | % | Types | % | Types | % | Types | % |
| Nominated property | 67 | | 226 | | 49 | | 23 | | 36 | | 20 | |
| Huangshan | 45 | 148.89 | 170 | 148.30 | 38 | 129.00 | 20 | 115.00 | 24 | 150.00 | | |
| Jiangxi Province | 106 | 63.21 | 422 | 53.55 | 80 | 61.25 | 40 | 57.50 | 205 | 17.56 | 36 | 55.56 |
| Zhejiang Province | 99 | 67.68 | 414 | 54.59 | 82 | 59.76 | 43 | 53.49 | 185 | 19.46 | | |
| Anhui Province | 96 | 69.79 | 352 | 64.20 | 68 | 72.06 | 39 | 58.97 | 170 | 21.17 | | |
| Fu jian Province | 110 | 60.91 | 543 | 41.62 | 115 | 42.61 | 44 | 52.27 | 163 | 22.09 | | |
| China | 609 | 11.00 | 1,260 | 17.94 | 403 | 12.16 | 278 | 8.27 | 1,010 | 3.56 | 129 | 15.50 |
| Burma | 300 | 22.33 | 967 | 23.37 | 241 | 20.33 | 75 | 30.67 | | | 68 | 29.41 |
| India | 350 | 19.14 | 1,200 | 18.83 | 453 | 10.82 | 182 | 12.64 | | | 77 | 25.97 |
| Indonesia | 515 | 13.01 | 1,519 | 14.88 | 600 | 8.17 | 270 | 8.52 | | | 121 | 16.53 |

Table 3.4 Vertebrate species: comparison between world, China and nominated property

| Types | Globe | China | Jiangxi | Nominated property |
|----------|--------|-------|---------|--------------------|
| Pisces | 24,000 | 1,010 | 205 | 36 |
| Amphibia | 4,200 | 278 | 40 | 23 |
| Reptilia | 6,000 | 403 | 80 | 49 |
| Aves | 9,021 | 1,260 | 420 | 226 |
| Mammalia | 4,000 | 609 | 105 | 67 |



3.c-2 A special Comparison with Mount Huangshan

Regarding comparison with similar sites, whether on the World Heritage List or not, Mount Huangshan is probably the site with more similarities than any other sites with the nominated Mount Sanqingshan in terms of geological makeup (granite), landscape (mountainscape) and geographic location. Therefore, a special comparison is made here to address the similarities and differences between the two sites.

(i) Natural beauty and aesthetic importance

In terms of natural beauty and aesthetic value the only site that is comparable to come to Mount Sanqingshan is Mount Huangshan, though there are differences in the nature and quality of landscape.

Mount Huangshan has a larger area than Sanqingshan, having distinct but widely separated landscapes. The term ‘majestic’ may be applied to the Huangshan landscape. On the other hand, Sanqingshan is smaller in area and more compact, with the landscapes relatively concentrated. In particular, Peaks Yujing, Yuxu and Yuhua compose the highest summit of Sanqingshan, presenting a spectacular and dignified scenery.

Mount Sanqingshan has far more abundant, diverse and distinctive granite landforms than Mount Huangshan. Sanqingshan has a whole collection of microlandscapes: peak forest, peak pillar and peak cluster, and is especially notable for its pictographic (naturally sculpted) stones. The superlative scenes “ Oriental Goddess” and “Gigantic Boa” were formed by natural processes and are remarkably true to life. In terms of their shape, romantic charm and dimensions these stones are unique in the world. They may deserve the name “Unique masterpieces of the world,” and few man-made sculptures can match them. They are appreciated to be “the primary natural model for pictographic stones in all of China”. Mount Huangshan does not possess any representative of peak forest or peak cluster, although there are some pictographic stones. Of these, some are notably well-formed, but rather inferior in dimension and the quality of landscape when considered against Mount Sanqingshan.

Annual rainfall at Sanqingshan is 1,857.7mm, while at Huangshan is 1,670mm. The forest coverage at Sanqingshan is 91%, while that at Huangshan is 84.7%. Sanqingshan has a dense drainage system, with many waterfalls and creeks, and a stable inflow. Mount Sanqingshan has no barren places, and its granite landscape combines a rich vegetation cover with abundant water and billowing cloud. This forms a vertical zoning of the ecological landscape, which is thought to be rare among granite mountains, and which emphasizes the outstanding quality and style of “Elegance”. In contrast, Mount Huangshan receives less rainfall, and groundwater inflow, and there are some barren mountain tops. Here creeks and waterfalls are mainly seasonal landscapes.

Mount Huangshan appears grand and powerful. It has few forested mountain tops, so it is feasible for people to climb up and view distance vistas and take-in all of the view just at a glance. In contrast, Sanqingshan has abundant microlandscapes and a unique ecological zoning, making the landscape more three-dimensional. There is better access and options for tour routes on Sanqingshan, and it is possible to appreciate the

scenery from different points of view, different sites and different altitudes.

The Taoism culture in Sanqingshan climaxed in the Ming Dynasty, and has accumulated 1600 years of history and culture. There are a series of treasured ancient Taoism buildings, which reflect an environmentally-friendly awareness and concept of Taoism “Harmony of Human and Nature”. In particular, sculptures of dragons and tigers, and the Pagoda of Wind and Thunderstorm, are sculpted directly from mountain stones. Although extremely old and patched by weathering, they provide evidence of early Taoist history and exquisite technology, and are of great aesthetic value and artistic rarity. In contrast to Sanqingshan, Huangshan was discovered just in relatively recent times and does not have such a long cultural history as Sanqingshan.

From above analyses, it is seen that both Mount Sanqingshan and Mount Huangshan belong to the same granite landform, but they are greatly different in geomorphologic feature, environment to form landscape, the effect of landscape making, cultural intension and aesthetic feeling given by the mountains. Furthermore, Mount Sanqingshan combines the nature and culture in harmony to create a perfect national park.

It can be seen from the above analyses that both Mount Sanqingshan and Mount Huangshan have similar granite origins, but that they differ greatly in their geomorphology and range of microlandscapes, environmental conditions, natural beauty and aesthetic qualities, and cultural history. Furthermore, Mount Sanqingshan combines the nature and culture in harmony to create a perfect national park.

(ii) Geologic and geomorphologic features

As mentioned above (3c-1, iii), the only site inscribed on the World Heritage List that bears comparison with Mount Sanqingshan in the nature and quality of its landscape and landforms is Mount Huangshan. Both mountains are characterized by the landform type known as granite peak forest and both are sculpted from granite of Cretaceous age. However, the geoscientific context, mode of landscape genesis, and diversity of medium to small landforms, are different in many ways.

Huangshan is located in the southeastern part of the Yangzi Craton that embodies I- type and S-type granites, although the granite in the scenic area mainly belongs to S type. Meanwhile Sanqingshan is positioned near the suture zone between Yangzi Paleoplate and Cathaysian Paleoplate, at the western edge of Huaiyu Paleo Island Arc, i.e. to the south of Suzhou-Dexing Suture Zone. It therefore has a geotectonic setting and history and a geological evolution that is remarkably different from that of Huangshan.

With respect to the granite types concerned, Huangshan has I and S type granites, while in Sanqingshan area a whole sequence of Late Mesozoic (Yanshanian) I, S and A type granites were emplaced. Sanqingshan is composed of A type granite, which is the major component and the youngest member in the granite sequence.

Huangshan is made up of a large scale granite mass, which was subjected not only to tectonic movement and erosion, but also to Quaternary glacial scouring. Nevertheless, the glaciation was not as intensive as that in Yosemite National Park, the United States. So while the larger elements of the granite peak forest in Huangshan were preserved, many of the medium to small-scale landforms were destroyed. Such features are therefore a rarity on Huangshan. This means that, compared with Sanqingshan, Huangshan has more

peaks with a round summit and fewer peaks with a pyramid-like summit.

Sanqingshan was formed on a background of Neogene tectonic uplift of a granite batholith. Then a part of it, represented by the granite stock at Yujing Peak, was further uplifted in the Quaternary Period to form a tectonic mountain of ‘Uplift on Uplift’ type and a granite peak forest landscape of mountain. Peaks, mainly with a cone-like summit, and other medium to small scale micro-geomorphological landscapes are of various types, which are concentrated in a relatively small area. Of them “Gigantic Boa” and “Oriental Goddess” might be deemed to be superlative scenes in the world. In addition, the chemical weathering of the granite was weak and the mountain was not subjected to Quaternary glaciation, so the granite landscape has been well-preserved through recent geological time. As a consequence, it now represents the most perfect example of granite peak forest of tectonic movement type in the world. Furthermore, Sanqingshan is thought to be the most accessible and relevant place to study ongoing geological and geomorphological processes.

Mount Sanqingshan is therefore a unique and spectacular geologic wonder, with a very special geomorphological landscape not duplicated anywhere else in the world.

(iii) Ecological and biological features

The nominated property is different from Huangshan World Heritage Site in the following four aspects:

- 1) The local vegetation types are different. The nominated property has mid-subtropical humid evergreen broadleaved forest, while Huangshan has north subtropical deciduous broadleaved to evergreen broadleaved mixed forest;
- 2) The richness of known species are different. The nominated property possesses 2,373 species of higher plants and 401 species of vertebrate, while Huangshan has 1,805 and 297 species, respectively;
- 3) Analyses based on Research on Planning of Natural Reserve System in All-National Forests show that Huangshan is situated in Zhejiang-Anhui low hill area with a total value of thermal points for indicator species of 14.55, while the nominated property is located in the adjacent Zhejiang-Fujian Mountain Area and has a total value 25.10 (See Table 3.5);
- 4) The key species are distributed in different ways. In the nominated property, *Gausenii* is distributed across a large area, which is a rare feature in the world. The site has possibly become the recent distribution centre for *Pseudatsuga Gausenii* in Pinaceae. Besides, China endemic subspecies *Garrulax galbanus courtoisi*, thought to be near threatened species by IUCN in 1994, as noted too, not having been recorded for 50 years. In 2000, it was proved distributed in Sanqingshan Area.

Table 3.5 Comparison of wildlife and plants between Nomination and Huangshan World Heritage

| Region | Forest coverage(%) | Higher plants | Vertebrate | Wild plants under State Key Protection | Wild life under State Key Protection | Total thermal point value of indicating species |
|--------------------|--------------------|---------------|------------|--|--------------------------------------|---|
| Nominated property | 91 | 2,373 | 401 | 26 | 53 | ~25.10 |
| Huangshan | 84.7 | 1,805 | 297 | 28 | 31 | ~14.55 |

3.c-3 Comparison with Mount Wuyi on Biology

The nominated property is more typical with respect to East Asia-North America disjunct distribution genera and more notable in biogeographical composition than Mount Wuyi.

The regional vegetation of both the nominated property and Mount Wuyi World Heritage Site belong to the Mid-Subtropical Humid Evergreen Broadleaved Forest type. There are thus many similarities between the two sites with respect to their flora, diversity of vegetation types, and species of wild animals and plants. However, because it is situated on the suture zone of the Yangzi Paleoplate and Cathaysian Paleoplate, the nominated property has a much longer biological evolutionary history than Mount Wuyi. These biological values are displayed as follows:

(i) Mount Sanqingshan has more typical East Asia-North America disjunct distribution genera

Sanqingshan has 68 genera of plants which exhibit a disjunct distribution. This is 11 more genera than are to be found on Mount Wuyi (which harbours 57 genera of disjunct distribution). Of these genera, the ‘Two-Species Genera’ are particularly abundant in the nominated property. This suggests that Sanqingshan is the contemporary source and dispersal centre for the plants of East Asia-North America disjunct distribution genera. The nominated property also provides more abundant evidence than Mount Wuyi for a primordial geological relationship between the East Asian and North American continents.

(ii) The nominated property presents a diversity of bioclimatic zone

Mount Sanqingshan exhibits particularly clear bioclimatic zonation. The nominated property is an independently towering mountain with a large relative height and diversified vegetation. Thus, Sanqingshan has a prominent ‘island-like’ character. The east side of the mountain is characterized by a marine climate vegetation type, while the west side by continental composition. The southern flank is dominated by Mid-Subtropic Broadleaved Forest, while the northern flank has a northern zone variation of this forest type. These facts illustrate the very special biological values of Mount Sanqingshan, i.e., the site is located at the conjunction of different bioclimatic zones, the place of interchange and mixing of plants from different zones. In contrast, the vegetation of Mt. Wuyi is mainly under the influence of a mid-subtropic marine climate.

(iii) The geological component of the nominated property is more complex

Mount Sanqingshan has features typical of sub-tropic and temperate zones, while Mount Wuyi has a pan-tropical character. Not only are the East-Asia/North-America disjunct genera far more abundant and important on Mount Sanqingshan than on Mt. Wuyi, but Sanqingshan also has a far greater abundance of Northern Temperate and Paleo-Temperate genera than are to be found on Mt. Wuyi. Of special note, the

temperate coniferous forest is mainly occupied by *Pseudotsuga gaussenii*, *Pinus taiwanensis*, *Pseudotaxus chienii* in the nominated property, while *Pinus taiwanensis*, *Tsuga chinensis* var. *tchekiangensis*, and *Cryptomeria fortunei* dominate at Mt. Wuyi. Furthermore, the endemic species of deciduous broadleaved forest are more abundant on Sanqingshan than on Mt. Wuyi.

(IV) The nominated property is rich in ancient plant species

Ancient plant species that originated in the Mesozoic Era are distributed extensively over Mount Sanqingshan, i.e. *Pseudotsuga gaussenii*, *Pseudotaxus chienii*, *Amentotaxus argotaenia*, *Illicium jiadifengpi* var. *Baishanense* and *Disanthus cercidifolius* var. *longipes*. These species are barely present in the Mt. Wuyi property. Of special note, *Pseudotsuga gaussenii* thrives over a wide area of Sanqingshan and the mountain is recognised as the modern distribution centre of *Pseudotsuga* genus of the pinaceae family. This is a rare feature, of world significance.

(V) The phenetic family of the Chinese sub-tropic zone and higher plant species have a particularly dense distribution in the nominated property

The Chinese sub-tropic zone is the core zone of the East Asia Flora Zone System, distributed over 2 million m², unique in the world. The phenetic family includes: Lauraceae, Fagaceae, Magnoliaceae, Hamamelidaceae, Theaceae, Symplocaceae, Ericaceae, Aquifoliaceae, etc. Statistic shows that the number of phenetic families is slightly greater on Mount Wuyi than on Mount Sanqingshan. However, when measured in terms of unit area covered, both phenetic families and higher plants have a higher density in the nominated property

Table 3.6 Detail comparison on plant diversity between Mt Wuyi World Heritage Site and the Nominated Property

| Family/Genus/Species | | Sanqingshan(22,950ha.) | | Mt.Wuyi(99,975ha.) | | |
|--|--------------|------------------------|-------------------|--------------------|-------------------|------|
| | | Quantity | quantity/10000ha. | Quantity | quantity/10000ha. | |
| Endemic genus to China | | 19 | 8.3 | 27 | 2.7 | |
| Higher plant | Total | 2,373 | 1,034.0 | 2,888 | 288.9 | |
| | Bybryophyta | 368 | 160.3 | 361 | 36.1 | |
| | Pteridophyta | 179 | 78.0 | 280 | 28.0 | |
| | Gymnospermae | 24 | 10.5 | 25 | 2.5 | |
| | Angiospermae | 1,802 | 785.2 | 2,222 | 222.3 | |
| Phenetic family of Chinese sub-tropic zone | Total | Genera | 37 | 16.1 | 47 | 4.7 |
| | | Species | 136 | 59.3 | 207 | 20.7 |
| | Lauraceae | Genera | 7 | 3.1 | 8 | 0.8 |
| | | Species | 32 | 13.9 | 38 | 3.8 |

Continued Table 3.6 Detail comparison on plant diversity between Mt Wuyi World Heritage Site and the Nominated Property

| Family/Genus/Species | | | Sanqingshan(22,950ha.) | | Mt.Wuyi(99,975ha.) | |
|--|----------------|---------|------------------------|-------------------|--------------------|-------------------|
| | | | Quantity | quantity/10000ha. | Quantity | quantity/10000ha. |
| Phenetic family of Chinese sub-tropic zone | Fagaceae | Genera | 6 | 2.6 | 6 | 0.6 |
| | | Species | 21 | 9.2 | 32 | 3.2 |
| | Magnoliaceae | Genera | 4 | 1.7 | 8 | 0.8 |
| | | Species | 8 | 3.5 | 18 | 1.8 |
| | Hamamelidaceae | Genera | 6 | 2.6 | 7 | 0.7 |
| | | Species | 10 | 4.4 | 13 | 1.3 |
| | Theaceae | Genera | 8 | 3.5 | 9 | 0.9 |
| | | Species | 21 | 9.2 | 35 | 3.5 |
| | Ericaceae | Genera | 4 | 1.7 | 7 | 0.7 |
| | | Species | 16 | 7.0 | 27 | 2.7 |
| | Aquifoliaceae | Genera | 1 | 0.4 | 1 | 0.1 |
| | | Species | 19 | 8.3 | 28 | 2.8 |
| | Symplocaceae | Genera | 1 | 0.4 | 1 | 0.1 |
| | | Species | 9 | 3.9 | 16 | 1.6 |

(this is partly explained by the fact that Wuyi covers an area four times larger than Sanqingshan). It is a most important fact that Mount Sanqingshan is the core zone of flora of East China, as well as a refuge for plant diversity of the Chinese sub-tropic zone in terms of flora element and vegetation composition.(Table 3.7).

The above analysis shows that the nominated property shows especially high particularity and typicality in biogeographical composition.

3.d Integrity

Not only does the nominated property possess outstanding individual natural values, but it also has high integrity. Mount Sanqingshan represents a superbly rich environment, hardly touched by people, and its natural system fully integrates the biological with the geological and meteorological resources.

(i) The nominated property contains intact granite geomorphology and ecology and shows a complete evolutionary sequence

The three genetic types of granites forming the rock basis of the nominated property show a complete evolutionary sequence of granite diorite porphyry, rapakivi adamellite and porphyroidal moyite. These granites exhibit clear mineralogical, structural and the tectonic-magmatic evolutionary sequences.

In the early stages, the granite mass had joints in a NE and NW direction, with an almost vertical and horizontal orientation. In the later stages, a fan-shaped rotational extension fracture pattern was developed and preserved.

Granite micro-landforms evolved from the more primitive peak wall, stone forest and peak cluster forms to the more sculptured stone cones and pictographic stones of various kinds. These have been completely preserved and present an outstanding opportunity for the study of granite landform evolution (Fig. 3.5).

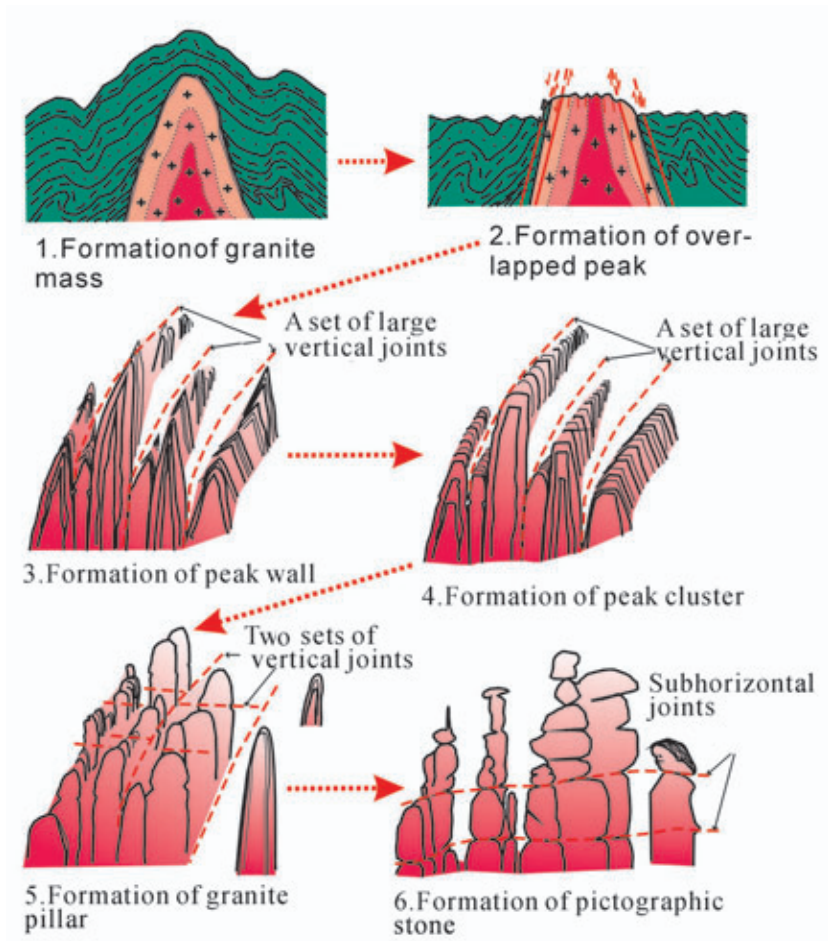


Fig. 3.5 Stages in the evolution of the granite landforms of Mount Sanqingshan (Yin Guosheng, 2006)

The combination of granite geology and landforms with the ecological and meteorological landscapes has produced a most remarkable vertically zoned (4-layered) landscape, preserving the mountain's primeval natural beauty and integrity (Fig. 3.1).

(ii) The nominated property covers a large area, aiding the conservation of rare species

The nominated property covers an area of 22,950 ha., with a proposed buffer zone of 16,850ha. The natural rivers and piedmonts extend to 40,000 ha. of special area protection to form what is termed “ the ecology island ”. With Yujing peak of Sanqingshan at the core, the nominated property has complex landforms spreading to its southern and northern slopes. These have suffered little human disturbance, thus ensuring a large natural area for the preservation of rare and endangered species and efficiently maintaining the ecosystem of warm-climate coniferous forest presented by *P.gaussenii*. The ever growing number and area coverage of *P.gaussenii* and *Tsuga chinensis* var. *tchekiangensis* is testimony to habitat success

and an East Asia-North America inter-continental evolutionary history.

The nominated property was designated a national non-profit Key Protective Forest Zone in 2001. Because forest coverage extends to as much as 91% or more of the property, Sanqingshan does not require afforestation measures and alien exotic plants are not permitted to be introduced into the area. China has laws and strict regulations to prohibit the introduction of alien plant and animal species. So long as ecological protection and environmental education of the public is maintained, the authenticity and integrity of Mount Sanqingshan can be sustained.

(iii) The nominated property contains all necessary elements of natural splendors

Five types of landscape resources are observed in the nominated property, namely, granite morphological landscape, meteorological landscape, rare plant and animal ecological landscape, river, lake and waterfall landscape as well as a Taoism cultural landscape. All are found within the nominated property and occur in specific places, thus enjoying comparative integrity as individual resources within a larger scale landscape and in their aggregated occurrence. For instance, the granite morphological landscape and the unusual meteorological landscape are exhibited well together at Nanqing in the Tiyunling, while the rare plant and animal landscape (including *P.gaussenii*) is found in the area surrounding Sanqing Palace. The value and aesthetic function of all landscape types found on Mount Sanqingshan satisfy national and international needs for scientific study.

Mount Sanqingshan is one of the world's great natural treasures, to be cherished, conserved and shared.

(iv) Less human activities intruding the pristine environment

Since settlers moved into the area about 300 years ago, displaced from the coastal zone by pirates, the nominated property has been little influenced by people. Even today, due to the geographical remoteness of the site on the border between three provinces, and because of the precipitous nature of the mountain terrain, Mount Sanqingshan remains difficult to access by the local and visiting public. With a resident population of just 5,790 within an area of 22,950 ha., the nominated property remains very lightly populated. In addition, there is no industry located within the area and local people maintain a primitive farming system, which has little impact on the heritage and the natural environment, but rather helps to maintain it.



SANQINGSHAN
CHINA

4. STATE OF CONSERVATION AND FACTORS AFFECTING THE PROPERTY

- 4.a Present State of Conservation
- 4.b Factors Affecting the Property

4. CONSERVATION AND FACTORS AFFECTING THE PROPERTY

4.a Present State of Conservation

In addition to protection as a National Park and a National Geopark, the nominated property is protected by several pieces of legislation, including the State Constitution, Forest Laws, Laws on Wildlife Protection, Water Laws, and Regulations on the Management of Nation Park.

An efficient multi-level management structure has been established. This guarantees a high standard in terms of personnel and organisations, supported with appropriate funds. Systems have been established (see section 6.a) to monitor the environment and wildlife and to deal promptly with any problems that might arise.

The outstanding value of aspects of the nominated property, such as the exceptional landforms, ecosystems, endangered species and their habitats, have been given a high degree of protection.

The nominated property has been affected, to a small extent, by natural factors and human activities. Impacts from natural factors relates to forest pests and fire, but not much in the way of disasters such as floods or mud-rock flow. Impacts from human activities refers to farming activities, felling, hunting and other land-use projects on the nominated property. However, relevant management bodies have implemented remedial measures, for example, returning some land from farming to forestry in areas not appropriate for use as farmland, and adjusting the agricultural industrial structure by developing diversified economic undertakings, all of which have produced good results.

Since the nominated property was designated by the State Council as a National Park in 1988 and in 2005 as a National Geopark by the Ministry of Land and Resources of the People's Republic of China, the precise area has been defined and the boundary set in accordance with the prescriptions outlined in the planning documents General Plan on Mount Sanqingshan National Park of Jiangxi Province and General Plan on Mount Sanqingshan National Granite Peak Forest Geopark of Jiangxi Province. A three-tiered management system (at the national, provincial and municipal levels) is in operation to safeguard the nominated property and a robust Management Committee for Mount Sanqingshan National Park has been appointed by Shangrao Municipal Government. These measures ensure effective management quality in terms of personnel, material and financial resources. Thanks to the steep landforms and large altitude differences, its remote location on the borders of Zhejiang and Jiangxi Provinces, and its inconvenient access to public transport, the nominated property suffers from very few human activities. For example, there is no farming activity or tree felling in the core area, thus preserving the site's primitive natural condition. In addition, efficient management has contributed to the complete preservation of the elegant and incomparable granite peak forest landscape, biological relicts and associated ecosystem, as well as the historic 1,600-year Taoism culture. In this sense, neither natural factors nor human activities have imposed untoward impact on the outstanding value of the nominated property.

4.b Factors Affecting the Property

The limited impact on the property by local people was mentioned above. Perhaps the biggest concern arises through tourism. Tourism of the nominated property has been in development since the 1980s and a significant increase in visitor numbers has been seen in recent years. Inevitably, this puts some pressure on the natural environment, and affects the indigenous human culture and bio-diversity. However, the various preservation designations (National Park, National Geopark, plus other protective legislations) have provided substantial protection, which has reduced many of the negative impacts of human activities. In this sense, there are limited adverse factors affecting the nominated property.

(i) Development pressure

While the pristine core of the nominated property has very little development pressure, the outer edges and buffer zone may generate some concern in the future. The nominated property has a history of hundreds of years of human habitation, most obviously seen today in the architectural relics of the core area and the small villages scattered throughout the area of the buffer zone. Human survival needs and social development have presented a conflict between the demand for such natural resources as land and forest and the preservation of nature. Because of the desire of local residents for a modern life and development of the social economy, human impacts have recently intensified in the area, which has imposed pressure on the integrity of the natural resources and general environment of the nominated property.

The principal human activities that present potential threats to the outstanding value and integrity of the nominated property are:

- Population: while the population density in the nominated property is extremely low, this is likely to grow in future years. The population density in the nominated property currently stands at 20.9 people per square kilometer and in the buffer zone at 140 people per square kilometer.
- Agriculture and land exploitation: agriculture has long been the principal activity in the area and occupies much land in the buffer zone. As the population grows, more land may be required for agriculture and new forms of farming may impose an additional threat to the integrity of the outer parts of the property.
- Industrial and mining activities: town construction and infrastructure construction around the buffer zone can be expected to have an impact on the surrounding landscape. For example, such development might bring about change to the aquatic environment, disturb wildlife to some extent and demand the extraction of mineral resources for construction purposes.
- Alien species invasion: there are no alien species in the nominated property, but forest pests have affected the natural plantation in some areas.

(ii) Environmental pressure

Since becoming a National Park, soil erosion and tree felling have been brought under control, but tourism development has introduced new environmental pressures. If the construction of facilities and the influx of

tourists were permitted to exceed the environmental capacity and self-purification capacity of the natural system, it would affect the atmospheric and aquatic environments and the geological landforms. It would also affect the fauna and flora, the stability of the ecosystem and the protection of bio-diversity. Considerable effort is being made therefore to manage tourism at a sustainable limit.

Currently there is no threat from pollution of air or water. Indeed, the very high air and water quality are important assets of the property, and hydrological and meteorological phenomena provide some of the most important visual spectacles. There will be a future threat from climate change, in terms of landform development, composition of plant and animal communities, pests and alien species, but currently only limited research on this subject has been undertaken.

(iii) Natural disasters and risk preparedness

Natural disasters might arise from forest fires, floods and landslips, and the impact on the forest vegetation by harmful insects. Fires have traditionally been a problem because of the distinct differences between the dry and rainy seasons. Hillsides with dry vegetation are at risk of fires during the summer, although none has occurred during the last 17 years, thanks to rigorous monitoring and public education. Similarly, with such steep slopes, periodic heavy rainfall and abundant surface runoff, and the impact of human activities and construction projects, floods and landslips remain a constant threat. Currently the biological threat to the property comes principally from the activities of the Pine aphid, Longhorn beetle and Batocera Horsfieldi. Global climate change is likely to increase the frequency and impacts of these events.

Measures taken to prepare for natural disasters and risks A system has been put in place to train personnel in awareness and measures for guarding against natural disasters. Warning notices and protective measures have been erected at the dangerous sections of the sightseeing areas and personnel have been assigned to tour guidance.

A forest fire prevention plan has been established, which includes a pre-warning system embracing government, townships, enterprises and residents. A headquarters for the forest fire prevention team has been established, which will strengthen the work of popularizing fire prevention, as well as being on call to fight against forest fires, should they occur. Messages are put out regularly, so as to raise awareness of fire prevention with local villagers. During the annual period of high risk, fires in the open air for production and living use are prohibited. With all these measures in place, forest fire has been avoided for 17 years running.

Regulations from provisions on forest pest Control have been rigorously implemented in the nominated property. An effective plan has been formulated to prevent and control forestry pests. Biological control is the major measure used, aided with mechanical and physical methods. Technical personnel have been engaged in the forecasting and control of forestry pests. Control planning is worked out in accordance with the practical need of the year. A forecasting, quarantine and inspection laboratory carries out regular monitoring for forestry pests. To prevent the invasion of forest pests, quarantine measures are to be strengthened for trees, wood and bamboo transported into the area. Combined with tree planting and afforestation,

personnel give guidance to people to encourage the planting of mixed woodland and to strengthen the management of the forest. They monitor the condition of the trees and can act promptly to remove trees affected by pests and prevent their spread.

(iv) Visitor/tourism pressure

Current and forecast With high quality tourist facilities, Mount Sanqingshan has been playing a leading role in tourism development of Shangrao. Visitor numbers to the mountain have reached 298,000 per year. According to forward planning forecasts to the year 2020, annual visitor numbers are to be controlled within 900,000.

Capacity and pressure on the environment At busy times, especially during peak holiday periods, tourist numbers may reach saturation at some scenic spots. To protect the eco-environment, visitor numbers are to be controlled at a maximum of 7,400 per day. Tourism activities not only create waste, but also impose some impacts on the aquatic environmental quality of some scenic spots. There being no industrial activity within the nominated property, atmospheric environmental quality reaches Grade I of “Criteria on Environment Air Quality” (GB3095-1996). With larger numbers of tourists bringing exposure to foreign cultures may influence the life-styles of the local population, which might result in changes to its unsophisticated folk-styles and traditions in time may be lost.

Tourism and conservation management To enforce protection and management plans, a series of regulations and laws have been introduced, for example covering fire prevention and conservation of the natural environment. Tree felling or transplanting and unauthorized specimen collection is prohibited within the nominated property. It is also prohibited to open up land for agriculture or development without authorization, or to cut into the mountain for quarrying, to excavate sand or remove soil, or to hunt, catch, poison or disturb wildlife.

Sanitation within the nominated property has been improved by installing more public lavatories, establishing a special environmental sanitation department and personnel, and strictly regulating sanitation management.

A main entrance and ecological parking facility is being created at the outer boundary of the nominated property, which will prevent entry of vehicles not up to emission standard. Vehicles entering the area are forbidden to sound their horns and planning is in progress to employ energy-saving, environment-friendly transportation within the nominated property.

Tourism construction projects are rigorously controlled, so as to achieve ecologically friendly sightseeing of the scenic spots. A monitoring system is in operation to keep visitor numbers within the capacity limits.

To allow the environment and landscape to recover from tourism pressures, it is intended to sequentially rest the well-used scenic spots.



(v) Number of inhabitants within the property and buffer zone

The nominated property and buffer zone has 5 towns and 15 administrative villages, all lying in Dexing city and Yushan County. At the time of nomination, the numbers of inhabitants within the property and buffer zone are:

| Area | Number of inhabitants |
|--------------------|-----------------------|
| Nominated property | 5,790 |
| Buffer zone | 23,598 |



5. PROTECTION AND MANAGEMENT

- 5.a Ownership
- 5.b Protective Designation
- 5.c Means of Implementing Protective Measures
- 5.d Existing Plans Related to Municipality and Region in which the Proposed Property is Located
- 5.e Property Management Plan or Other Management System
- 5.f Sources and Levels of Finance
- 5.g Sources of Expertise and Training in Conservation and Management Techniques
- 5.h Visitor Facilities and Statistics
- 5.i Policies and Programmes Related to the Presentation and Promotion of the Property
- 5.j Staffing Levels



5. PROTECTION AND MANAGEMENT

5.a Ownership

Mount Sanqingshan National Park is the state property of People's Republic of China.

5.b Protective Designation

(i) Protective designation

Table 5.1 Protective designation of the nominated property of Mount Sanqingshan for World Heritage

| Nominated property | Protective designation and date for approval |
|--------------------|---|
| Mount Sanqingshan | National Park of China, approved by the State Council in August, 1988 |
| | National Geopark, approved by Ministry of Land and Resources, People's Republic of China in September, 2005 |

(ii) Legal basis of the conservation and management work

Table 5.2 List of laws guaranteeing legal status of the nominated property

| Name | Issuing date | Issued by |
|---|--------------|---|
| Constitution of People's Republic of China | 1982 | The National People's Congress |
| Law on Environmental Protection of People's Republic of China | 1989 | At 11 th session of the Standing Committee of 7 th National People's Congress |
| Forest Law of People's Republic of China | 1998 | At 24 th session of the Standing Committee of 9 th National People's Congress |
| Law on Wildlife Protection of People's Republic of China | 1988 | At 4 th session of the Standing Committee of 7 th National People's Congress |
| Water Law of People's Republic of China | 1988 | At 2 nd session of the Standing Committee of 6 th National People's Congress |
| Provisional Regulations on Management of Scenic Zones of People's Republic of China | 2006 | The State Council ,PRC |
| Management Methods on Scenic Zones of Jiangxi Province | 2000 | Jiangxi Provincial People's Government |
| Regulations on Management of Mount Sanqingshan National Park of Jiangxi Province | 2006 | Standing Committee of People's Congress of Jiangxi Province |

Constitution of People's Republic of China

Article 9: The state guarantees reasonable usage of natural resources, and protects rare and precious animals and plants. It is prohibited to usurp or destroy natural resources by any means.

Article 22: The state protects scenic spots and historical sites, rare cultural relics and other important historic and cultural heritage.

Article 26: The state protects and improves living environment and eco-environment, prevents and controls pollution or other public hazards. The state organizes and encourages tree planting, afforestation and tree protection.

Law on Environmental Protection of People's Republic of China

Article 17: Governments on all levels should take measures to protect representative zones of all kinds of natural ecosystems, designated areas of rare, precious and endangered wildlife, important headwater, geology, famous water-eroded caves and fossil with significant scientific and cultural values. Protection is also needed for natural relics as glaciers, volcanoes and hot springs, etc., human culture and ancient trees.

Article 19: Measures must be taken to protect the eco-environment in developing and exploiting natural resources.

Article 23: Characteristics of local natural environment should be taken into consideration in carrying out township construction, upgrading the construction work of gardens, green space and scenic areas in cities, in which, plantation, water area and natural landscapes should be protected.

Forest Law of People's Republic of China

Article 19: Local governments on all levels should organize relevant departments to set up forest protection organization to be responsible for forest protection works; Facilities are to be set up extensively in forest with practical needs, so as to strengthen forest protection; Grassroot units and the public in forest regions are requested and organized to co-operate and work together to protect forest, define responsibility for forest protection and dispatch personnel for full-time or part-time forest protection job.

Article 20: Forestry departments of the state, provinces, autonomous regions and municipalities should define the nature reserve area by ecological zones, forest regions with rare and precious plants and animals, tropical forest regions and other natural forest regions with outstanding protection value, so as to strengthen the protection and management works.

Article 21: Local governments on all levels are obliged to perform well in forest fire prevention and extinguishing works.

Article 24: Forestry departments of the state, provinces, autonomous regions and municipalities should define the nature reserve area by ecological zones, forest regions with rare and precious plants and animals, tropical forest regions and other natural forest regions with outstanding protection value, so as to strengthen the protection and management works. Conscientious protection work should be done on plant resources with exceptional value outside the nature reserves. Tree felling or collection are prohibited without authorization from the forestry administration departments of the province, autonomous region or municipality.

**Law on Wildlife Protection of People's Republic of China**

Article 6: Governments on all levels should upgrade management work on wildlife resources, formulate planning and measures on the protection, development and rational utilization of wildlife resources.

Article 8: The state protects wildlife and its living environment, and any organizations or individuals are prohibited to hunt or destroy wildlife illegally.

Article 9: The state attaches great importance to protecting rare, precious and endangered wild animals, which are divided into wild animals under Grade I protection and Grade II protection. Wild animal category under key national protection is formulated or adjusted by administrative departments on wild animals from the State Council with its prior approval.

Water Law of People's Republic of China

Article 5: The state protects water resources by taking effective measures to protect natural plantation by planting trees and grasses, so as to conserve water source and prevent soil erosion improving the eco-environment.

Provisional Regulations on Management of Scenic Zones of People's Republic of China

Article 2: Scenic zones are defined as regions with appreciative, cultural or scientific values, which can be used for recreation or scientific popularization.

Article 10: Investigation and evaluation work should be done on important sceneries, cultural relics, ancient and precious trees within any scenic zones. Their protective measures should be worked out and implemented.

Article 24: Landscapes and natural environment in scope of scenic zones should be strictly protected in accordance with principles of sustainable development, and should not be allowed to damage or change at will. Management organs of scenic zone should elaborate regulation to protect the resources of scenic and historical interest. Residents and visitors of scenic zone should take good care of sceneries, water body, forest, meadow and wildlife, and cherish all public facilities.

Article 25: Management organs of scenic zone must undertake investigation and identification of major landscapes, and work out corresponding protection measures.

Regulations on Management of Sanqingshan National Park

Article 4: Administrative committee of Sanqingshan National Park (Sanqingshan Administrative Committee) as agency of Shangrao City People's Government is responsible for the conservation, usage and integrated management of Sanqingshan National Park based on recent regulations.

Article 13: Landscapes and natural environment of Sanqingshan National Park should be protected strictly, and not allowed to damage or change at will.

Article 14: Sanqingshan Administrative Committee must make investigation and identification of natural and cultural landscapes within Sanqingshan National Park, build achieves; work out countermeasures to protect key protection subjects: special geologic remains and cultural landscapes.

Article 15: Sanqingshan Administrative Committee should make all efforts to prevent geological disasters, forest fire, and control and eliminate harmful pests, at the same time promote afforestation and conservation of forest resources.

5.c Means of Implementing Protective Measures

(i) Management systems and ordinances

On the basis of observing the existing laws of China, a series of management systems and ordinances have been formulated to make the protective measures more efficient and feasible, to further perfect protective measures at the nominated property (please refer to 5.b.ii for detail) and to practically implement all protection and management work.

(ii) Management departments

Under the concentrated administration of Ministry of Construction of People's Republic of China, the Department of Construction, Jiangxi Province has management responsibility for the nominated property. Shangrao Municipal People's Government has delegated direct management of the nominated property to the Management Committee of Mount Sanqingshan National Park of Jiangxi Province. All management departments determine their own responsibilities and perform their corresponding tasks while cooperating with each other to ensure an orderly protection and management system for the nominated property.

(iii) Protection planning

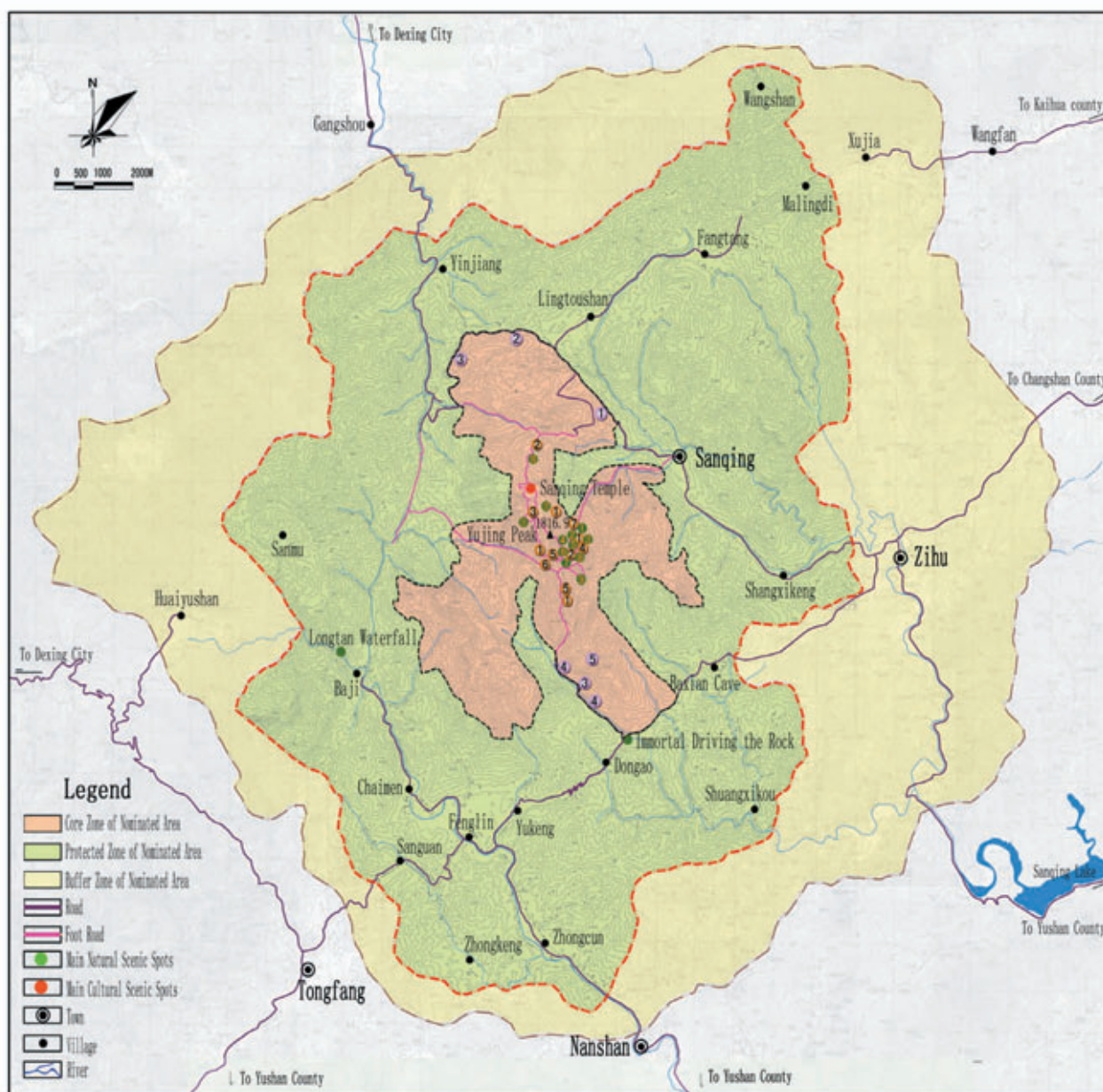
Related plans (please refer to 5.d for detail) have been worked out for the protection of the nominated property. Specific regulations and demands have been made on the management and protection work identified in the different plans. For greater efficiency and effectiveness, specific management plans and protection measures have been drawn up for the nominated property. In these, effective protective measures have been proposed by focusing on protection for heritage with outstanding value within the nominated property (please refer to map 5.1 for detail).

(iv) Protection in different zones and different grades

Based on the scientific and preservation values of the nominated site, taking into account different functional areas, the protection zone is divided into special areas of : Grade I, Grade II and Grade III.

Special grade protection area The area containing the rare plant community *Pseudotsuga gaussenii*, and those with the richest resources of micro-landform landscape, primitive forest plantation and wildlife is defined as a special grade protection area. Scenery, landscape and natural environment within the area must be maintained in their present situation, only equipped with basic devices for scientific research and safety. Tourists are forbidden to enter the zone and construction of buildings or facilities is prohibited.

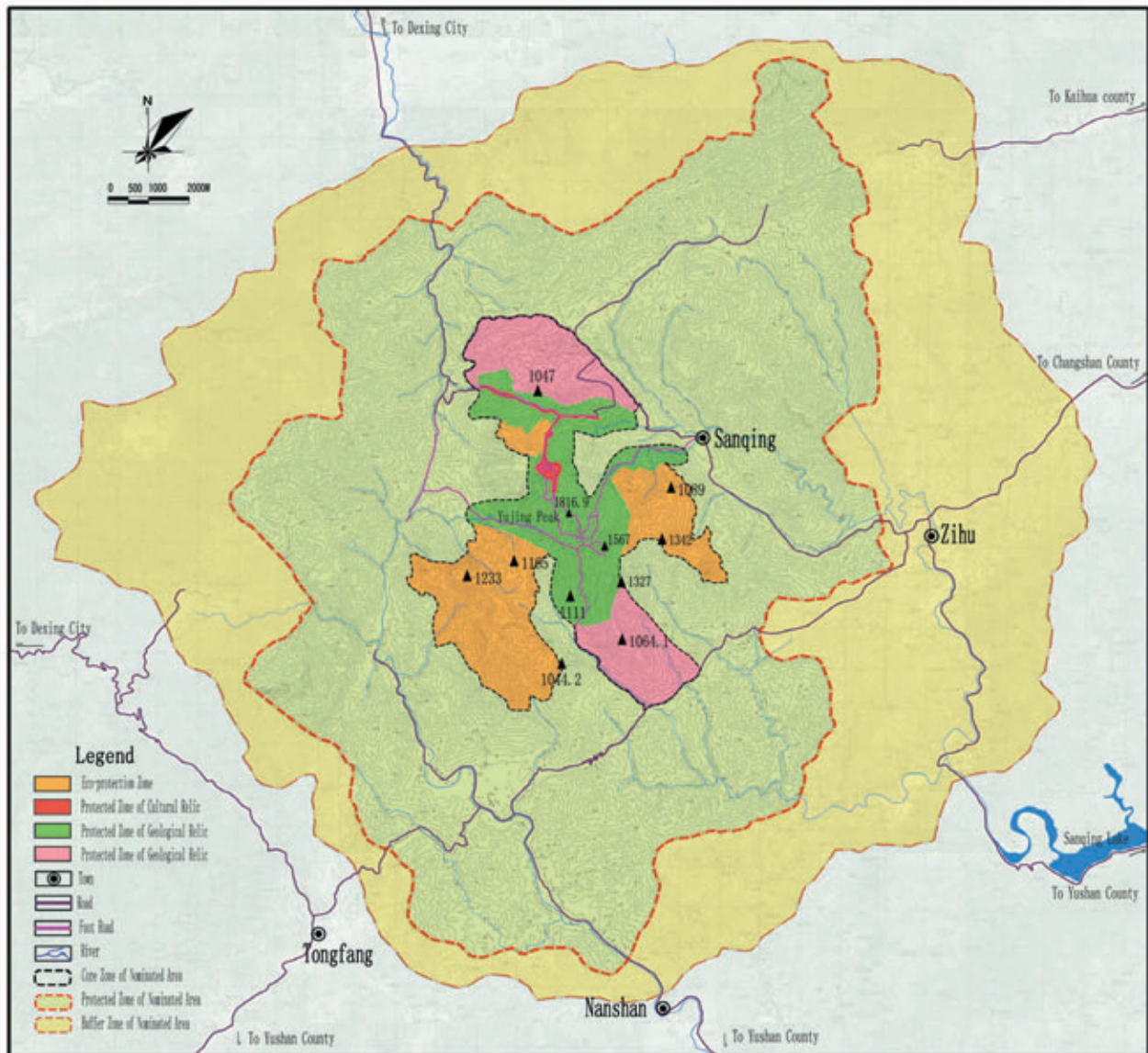
Grade I protection area The definition of Grade I protection area is based on the visual range of class I landscape, in which, only necessary tourist walkways and safety devices are allowed. Construction of facilities irrelevant to the landscape is prohibited, and accommodation must not be arranged within the zone.



Map5.1 Master Plan of Mount Sanqingshan Nominated Area

Grade II protection area The area outside the geological landscape is defined as Grade II protection area. A small amount of accommodation and restaurants may be arranged in the zone, but construction irrelevant to sightseeing must be restricted.

Grade III protection area The area outside the above protection areas is defined as Grade III protection zone. In this zone, all construction and facilities should be under orderly control, which should be in harmony with the landscape environment.



Map 5.2 Divisional Protected Area of Mount Sanqingshan Nominated Area

(v) Monitoring work

Extensive monitoring systems have been set up to enable real time scientific monitoring on a regular or irregular basis (please refer to 6.a for details). This facilitates a better understanding of the dynamic change processes on the geology and landform, eco-environment, plant and animal species, social economy, population, geological disasters, plantation regeneration, tourist number and land exploitation. It also enables managers to promptly detect and settle problems in the hope of better protecting the outstanding value of the nominated property.

(vi) Local customary protection

Village rules and regulations, as a sort of primitive law, provide the basis for a code of conduct by community residents. This code is accepted through common practice by villagers, who formulate and observe the rules and regulations. The regulations therefore enjoy high authority. Village rules and regulations, together

with forest protection activities, are very efficient customary protective measures. Residents in the nominated property also practice traditional methods to protect their local environment, one of which is to quickly modify or improve the village rules and regulations to protect the surrounding environment if there is a perceived threat to it. For instance, specific regulations have been made in Shangxikeng Village of Sanqing Country relating to activities falling into the category of “unauthorized fire use in the open air, tree felling and unauthorized quarrying”.

With the formulation of village rules and regulations, residents have raised their awareness in protecting the natural resources, aroused their enthusiasm in participating in the protection and upgraded their community management capacity and self-discipline, thus playing a more efficient role in effectively managing local eco-environment, ecosystem and natural resources. With economic and social development, as well as active pursuit of a more modern social life, the living and working styles of villagers in the nominated area have advanced significantly. Nevertheless, villagers have consciously worked to be more ecologically and environmentally friendly.

5.d Existing Plans Related to the Municipality and Region in which the Proposed Property is Located (e.g., regional or local plan, tourism development plan)

(i) Existing relevant planning from local city and districts of the nominated property

Table 5.3 Existing relevant plans of local city and districts of the nominated property

| Relevant plans | Compiled by | Date of approval |
|---|--|------------------|
| Tenth Five-year Plan on Social and Economic Development and Perspective Program of Jiangxi Province (2000-2020) | Jiangxi Provincial People's Government | 2001 |
| Plan on City and Town System of Jiangxi Province(2005-2020) | Jiangxi Provincial People's Government | 2004 |
| Plan on Tourism Development of Jiangxi Province(2003-2020) | Jiangxi Provincial People's Government | 2002 |
| Tenth Five-year Plan on Social and Economic Development and Perspective Program of Shangrao (2000-2020) | Shangrao Municipal People's Government | 2001 |
| Plan on City and Town System of Shangrao(2005-2020) | Shangrao Municipal People's Government | 2004 |
| Plan on Tourism Development of Shangrao(2003-2020) | Shangrao Municipal People's Government | 2002 |
| General Plan on Sanqingshan National Park of Jiangxi Province (2003-2020) | Management Committee on Sanqingshan Scenic Spots | 2005 |
| Planning on Core Scenic Areas at Mount Sanqingshan National Park of Jiangxi Province | Management Committee on Sanqingshan Scenic Spots | 2004 |
| General Plan on Land Exploitation at Mount Sanqingshan National Park of Jiangxi Province | Management Committee on Sanqingshan Scenic Spots | 2003 |
| General Plan on Mount Sanqingshan National Granite Peak Forest Geopark of Jiangxi Province | Management Committee on Sanqingshan Scenic Spots | 2005 |

Continued table 5.3 Existing relevant plans of local city and districts of the nominated property

| Relevant plans | Compiled by | Date of approval |
|---|--|------------------|
| An Outline for“1+5”Tourism Development and Construction of Shangrao | Shangrao Municipal People’s Government | 2004 |
| General Plan on Tourism Development of Yushan County (2005-2020) | Yushan County People’s Government | 2005 |
| General Plan on Tourism Development of Dexing City (2001-2020) | Dexing Municipal People’s Government | 2002 |

(ii) Summary of clause contents from relevant regulations

The General Plan of the nominated property is used as a guideline for protection, management and moderate development. It was approved by Ministry of Construction of People’s Republic of China in November 2005. It is prescribed in the General Plan that tourists are not allowed to enter the Special Grade protection area, in the hope of preserving its natural and primitive station, and rigorously protecting natural landscape and rare plant communities represented by *Pseudotsuga gaussenii*, as well as the migration routes of wild animals. Within the area of landscape appreciation, tourism services such as the education and interpretation relating to the geology, animals, plants and landscape can be provided under the circumstance of not destroying natural resources. Viewing platforms can only be constructed at suitable spots. Such activities as quarrying and destroying natural plantations are prohibited in Grade III protection area. In these areas also the scale, color and volume of tourism facilities are to be rigorously controlled, while safety devices are to be reasonably arranged. The number of tourist is to be controlled, existing buildings disturbing the landscape or those inharmonious with the environment are to be dismantled or renovated, housing projects are to be under rigorous control and plantation care and forestry pest prevention should be vigorously developed.

5.e Property Management Plan or Other Management System

(i) Existing management system at the nominated property

In 2005, Shangrao Municipal Government of Jiangxi Province approved Plan on Protection and Management of Mount Sanqingshan as a World Heritage Nominated Property.

(ii) Analysis and explanation

Specific coverage of the nominated property has been defined in the Management Plan. The Plan outlines the site’s outstanding value and the current protective situation, while some deficiencies are analyzed. The formulation of the Plan was necessary to define effective management goals relating to protection work. The aim of the Plan is the efficient and effective protection of the granite micro-landform landscape, unusual landscape forms, primitive ecosystems, and, primitive, rare and endangered plants and animals, as well

as the 1600-year-long Taoism cultural heritage. A further aim of the plan is to raise public awareness for protection work, thus encouraging voluntary participation in the protection activities, and enabling the sustainable development of the community, strengthening and maintaining the cultural heritage. Based on the identification of functional areas of the heritage protection, a series of efficient protection and management measures and strategies have been formulated (such as the development of a major management programme and management plan, determination of management capacity, comprehensive harnessing of environmental protection, including protection of the biodiversity and of rare and endangered plants and animals, surveillance and scientific study of the heritage, development of a training program on heritage management, popularization of heritage values and conservation awareness, development of tourism management and eco-tourism, sustainable development of the community, and protection of Taoism culture heritage, etc.). Please refer to the Annex for further details concerning protection and management planning.

(iii) Guarantees for the efficient implementation of management planning or other management systems

Legal guarantee: Numerous legal provisions of People's Republic of China guarantee the protection and management of world heritage sites. At the same time, relevant ordinances and management methods have been introduced specifically for the nominated property, so as to systematically guarantee the implementation of protection and management planning of the site (please refer to 5.6.ii for detail).

Management department: The nominated property is protected and managed by a high quality management team, at the national level managed from the Ministry of Construction of People's Republic of China, the State Forestry Administration and the Ministry of Land and Resources, etc., and at the provincial level by the Jiangxi Department of Construction, the Department of Forestry and Department of Land and Resources. Body represents these Departments at the local level. Management Committee of Sanqingshan National Park has also been established, which has specific day-to-day responsibilities for the management and administration of the nominated property. It includes the Office, the Planning and Construction Administration, the Administration on Land and Resources, the Social and Economic Development Board, the Forestry Administration and a finance office, etc.. While each of these bodies have their own responsibilities, they cooperate with each other on the management of the nominated property, so as to provide a powerful partnership team and strong guarantees for the effective implementation of the management strategies and work plans.

Community participation: The local community is an important part of the nominated property and the buffer zone. Community life is closely bound with the environment and the protection of the nominated property. Following the introduction of regional protective measures, such as the establishment of the national park and the national geopark at the site, awareness of the need to pursue eco-friendly practices and the capacity of local people to support site management has been improved greatly. In terms of resource management, there has been an encouraging shift in the attitudes of local people from passive participation to conscientious management, thus further guaranteeing implementation of the management plan at the site in terms of community participation.

5.f Sources and Levels of Finance

Between 1990 and 2005, the central government, local government and management department of the nominated property made a total investment of 1.67 billion RMB for investigation and scientific research on forest, geological and landscape resources at the nominated property, and for renovation of the human living environment, as well as infrastructure construction. Since the nominated property is located at an underdeveloped area of central China, 80% of fund is from the central government and the Jiangxi provincial government. Since 2000, there has been a substantial increase in the revenue budget.

Table 5.4 Fund source and level of the nominated property

| Year | Fund source and amount (10,000yuan) | | | Totalling |
|------|-------------------------------------|-----------------|---|-----------|
| | Financial revenue | Special subsidy | Fixed asset investment of the whole society | |
| 2000 | 540 | 255 | 2,230 | 3,025 |
| 2001 | 700 | 128 | 5,800 | 6,628 |
| 2002 | 860 | 294 | 12,220 | 13,374 |
| 2003 | 1,610 | 237.8 | 21,800 | 23,647.8 |
| 2004 | 3,000 | 195.4 | 32,800 | 35,995.4 |
| 2005 | 4,500 | 469.5 | 40,800 | 45,769.5 |

5.g Sources of Expertise and Training in Conservation and Management Techniques

Experts and scholars from both at home and abroad have been invited over the longer for technical instruction on research, protection and management of granite geology & landforms and zoology at the nominated property. Organisations such as the Ministry of Construction of People's Republic of China attached much importance to personnel quality at the nominated property, and training programmes of all kinds are often done here. Up to now, with the support of and instruction from the Ministry of Construction, the State Bureau of Forestry, the Ministry of Land and Resources and the China Academy of Sciences, various training programs have been made by the Provincial Department of Construction of Jiangxi, Department of Land and Resources, Department of Forestry, Cultural Relics Bureau and Tourism Bureau of Jiangxi Province. Training programs cover such things as landscape planning, construction management, resource protection, laws and regulations within the scenic zone, forest fire prevention, as well as computer-based monitoring information systems and their application, operation of touch system software and hardware, heritage management of the world heritage site, protection of biodiversity, scientific research, sustainable development of ecological tourism, and social and economic development of the nominated property, etc.. Thus, personnel in the site, from senior management to tourist guides, have a better understanding about the world-ranking heritage and geology, environmental protection, and tourism management of the nominated property.



5.h Visitor Facilities and Statistics

(i) Statistics relating to recent tourist numbers at the nominated property

Table 5.5 Statistics of tourist numbers at Mount Sanqingshan National Park

| Year | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|-------------------------|------|------|------|------|------|------|------|
| Tourist number (10,000) | 3.7 | 5.1 | 9 | 10.2 | 13 | 18.5 | 29.8 |
| Growth rate | | 37.8 | 76.5 | 11 | 12.7 | 14.3 | 16 |

(ii) Tourist reception facilities

Table 5.6 Facilities at major tourist reception areas

| Tourist reception area | Beds | Restaurants | Hospitals | Other services |
|------------------------|-------|-------------|-----------|----------------|
| Waishuangxi | 1,260 | 8 | 2 | 3 |
| Jinsha | 350 | 3 | 1 | 1 |
| Zihu | 700 | 7 | 2 | 1 |
| Fenshui | 120 | 3 | 1 | 1 |

(iii) Convenient measures

There are over 160 different kinds of publications, totalling 7 million books, introducing the visitor or interested personal to Mount Sanqingshan.

At present, for the convenience of tourists, major tourist reception areas are equipped with parking lots, signs and boards, information panels promoting the protection of Mount Sanqingshan and first aid centers.

Tour guides, safety inspectors and sedan chair men are trained and managed, and a tourist service center has been established to ensure safety and convenience for sightseeing.

More than 50 toilets, 40 waste treatment spots, 300 waste bins and 50-kilometer of tourist walkway and plank way have been installed or built. The high-level path, known colloquially as ‘the sky path’, is a suspended route across faces of precipitous cliffs. It was completed in 2004 and with a length of approximately 4km and exposed setting, is ranked as one of the most spectacular visitor trails in the world.

Table 5.7 Statistics on tourist facilities at the nominated property

| Tourist facilities | | Number | Explanation |
|--|------------------|--------|--|
| Explanation | Walkway(km) | 50 | Going through 7 scenic spots, and forming a circular line |
| | Tour guides | 135 | Having been trained, and having a certificate for the job |
| | Signs and boards | 256 | Direction boards for sceneries and signs for tourist map |
| | Publications | 160 | Books, picture albums and audio and visual publications about the park |
| Museum of the heritage site | | 1 | Under construction |
| Tourist center | | 2 | Covering a building area of 3,600m ² |
| Accommodation service | | 4 | Located at outer boundary of the nominated site |
| Restaurants and resting places for tourist | | 6 | Located at outer boundary of all scenic areas |
| Shops | | 5 | At the entrance of scenic spots |
| Parking lots | | 5 | Covering an area of 33,000m ² |
| Toilets | | 50 | With 268 positions |
| First-aid centers | | 4 | At all major scenic areas |

5.i Policies and Programmes Related to the Presentation and Promotion of the Property

One of the purposes of the national park as outlined in the General Plan is to assist with the social and economic development of the local and regional community and promoting the concept of protection through sustainable development. Work in promoting the area's natural and cultural heritage seeks to achieve these purposes.

Modern media such as television, broadcasting and the Internet, etc. are employed to spread the message about the outstanding natural qualities and important scientific and aesthetic values of the nominated property, and also to raise public awareness to protect them.

The momentum of scientific research will be maintained and strengthened by the contributions of and partnerships with scientific research institutes and universities. The intention is to continue to learn more about the value of the nominated property. Already such research has generated a large number of scientific papers and monographs and it is intended that this trend should continue so that new information emerges that will significantly enhance the importance of the site. To date over 300 papers have been published about the outstanding granite landscape and ecology, and there remain many research questions to be answered, making the nominated property a focal point for researchers both from home and abroad.

Experts and scholars from both home and abroad are often invited for special meetings and investigations, or they are invited as technical consultants to work on the geology or geomorphology, plant and animal resources, eco-tourism and aesthetic production at the nominated property, or to conduct training programmes on personnel and tour guides about heritage knowledge and the protective management work.

5.j Staffing Levels (professional, technical, maintenance)

There are 242 personnel that provide professional protection and management work at the nominated property. These staff are responsible for the administration, resource investigation, information monitoring, scientific research, environmental protection, fire prevention, law enforcement for protection work and publicity work. Out of the personnel, technical personnel with a professional and technical title above middle rank account for 15%. The professional background of the site's staff covers such fields as physical geography, geology,

Table 5.8 Part of media coverage about the nominated property

| Time | Media name | Program | Content | Broadcasting condition |
|-----------|----------------------------|---|---|-----------------------------|
| 2001 | CCTV-1 | Oriental Horizon | Human culture | Has been broadcasted |
| 2003-2005 | CCTV-1,CCTV-4 and CCTV7 | Qing Nin Xin Shang (Please Admire the Natural Beauty) | Natural scenery | To be broadcasted in series |
| 2002-2004 | CCTV-2 | Lvyou Fengxiangbiao (Travel Guide) | Natural scenery and human culture | Has been broadcasted |
| 2003 | BJTV-1 | Shenzhou Fengcai (Glamour of China) | Natural scenery | Has been broadcasted |
| 2001-2005 | ZJTV-1 | Traveling Time in Jiangnan Hao (Heavenly Jiangnan) | Human culture and natural scenery | To be broadcasted in series |
| 2002 | JXTV-1 | Beautiful Jiangxi | Human culture and natural scenery | Has been broadcasted |
| 2002 | HBTU-1 | Fortunate Global Village | Human culture and natural scenery | Having been broadcasted |
| 2004 | GDTV-1 | New Tourism | Human culture | Has been broadcasted |
| 2003 | TJTV-1 | Going Places | Human culture and natural scenery | Has been broadcasted |
| 2004 | SZTV-1 | On Traveling Journey | Human culture and natural scenery | Has been broadcasted |
| 2004 | WTO and China | Editorial Department | Human culture and natural scenery | Has been published |
| 2005 | Chinese National Geography | Editorial Department | Granite peak forest geology and landforms | Has been published |

environmental engineering, botany, zoology, conceptual design, scenic spot and garden management, geological information systems, tourism management, water conservancy and hydrological engineering, accountancy, etc..

The site's managing bodies have always attached great importance to upgrading personnel quality and the training of personnel. Training programs may take the form of short-term lecture courses, an intensive training program, on-the-job training, training for new-comers, or by dispatching personnel to other world heritage properties or national geoparks in China to hold a temporary post.

6. MONITORING

- 6.a Key Indicators for Measuring State of Conservation
- 6.b Administrative Arrangements for Monitoring Property
- 6.c Results of Previous Reporting Exercises



6. MONITORING

6. a Key Indicators for Measuring State of Conservation

The nominated property has satisfied three World Heritage criteria. An indicator system meeting the need of heritage management is set up in compliance with heritage type and preservation condition of the nominated property (Table 6.1).

Table 6.1 Monitoring indicator of the condition of the nominated property

| Surveillance indicator | Cycle | Department storing the materials |
|--|---------------|--|
| Completeness(classification, boundary and type) | year | Jiangxi Provincial Department of Construction, Management Committee of Mount Sanqingshan National Park |
| Quantity and soundness | year | Management Committee of Mount Sanqingshan National Park |
| Types and quantity of plantation and plants | year | Management Committee of Mount Sanqingshan National Park, Shangrao Forestry Science Institute |
| Types and quantity of animals | 5 years | Wildlife Conservation Bureau of Jiangxi Province |
| Alien species and its dangers | Non-scheduled | Jiangxi Provinc,Department of Forestry; Shangrao Municipal Bureau of Forestry |
| Environment quality indicators in atmosphere, water body and noise, etc. | year | Shangrao Environmental Protection Bureau |
| Hydrologic regime and water quality | year | Shangrao Water Conservancy Bureau, Shangrao Environmental Protection Bureau |
| Village number and population within buffer zone | year | Management Committee of Mount Sanqingshan National Park, Bureau of Land and Resources, Shangrao |
| Cultivated area within buffer zone | year | Shangrao Bureau of Land and Resources |
| Sightseeing and recreational activities in the scenic zone | year | Management Committee of Mount Sanqingshan National Park, Shangrao Tourism Bureau |
| Tourist and sightseeing program | year | Management Committee of Mount Sanqingshan National Park |
| Natural disaster | year | Department of Land and Resources Jiangxi Province |
| Impact of community development projects on nominated property | 5 years | Management Committee of Mount Sanqingshan National Park |
| Change in type of land exploitation | 5 years | Management Committee of Mount Sanqingshan National Park, Shangrao Bureau of Land and Resources |
| Forest fire | year | Management Committee of Mount Sanqingshan National Park, Shangrao Forestry Bureau |

(i) Protective monitoring of granite geology and landforms

Monitoring is done on change, safety and environment of the granite geology and landforms.

(ii) Indicators on ecological process and bio-diversity

Monitoring is done on plantation, animals, plant and animal type and cave animal types, and alien species (invaded life forms).

(iii) Environmental indicators

Monitoring is done on weather change, atmospheric quality, water body quality, noise and environmental sanitation.

(iv) Surveillance on land exploitation

Monitoring is done on land use as farm land, for construction use, as water body, forest felling, afforestation and transportation, etc.

(v) Management of tourists

Monitoring is done on tourist numbers, sightseeing programmes, coverage of scenic spots as well as on tourism service facilities and quality.

(vi) Monitoring of natural disasters

Monitoring work is focused on meteorological disaster, fire accidents, drought and flood, and mud rock flow, etc.

6. b Administrative Arrangements for Monitoring Property

(i) Administrative system of the management and surveillance work

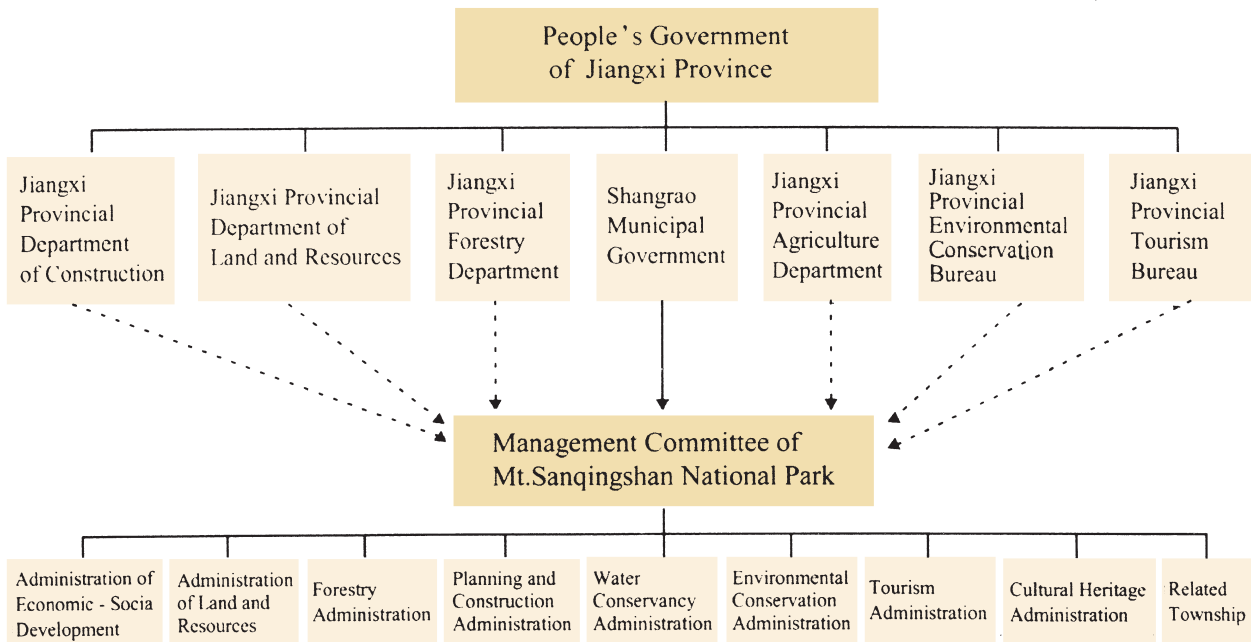


Fig.6.1 Block diagram of administrative system of the management and monitoring work

(ii) Scientific and technological monitoring system

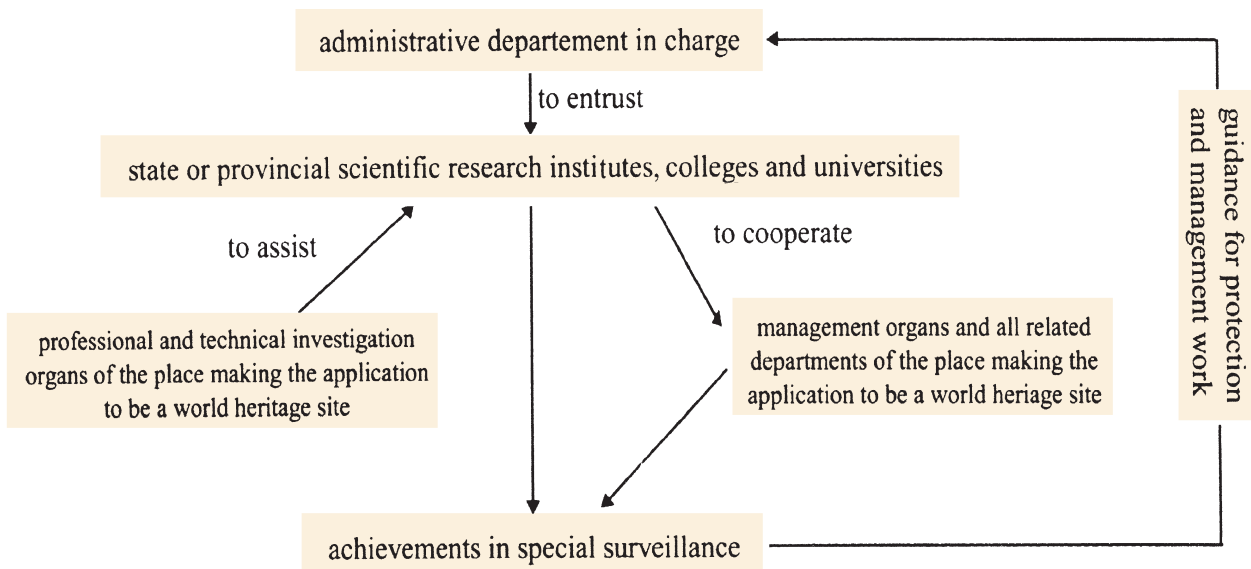


Fig.6.2 Block diagram of scientific and technological monitoring system

(iii) Units responsible for administrative monitoring work

Table 6.2 Units responsible for administrative monitoring the heritage of the nominated site

| Surveillance organisation | Tel. | Address | Zip code |
|---|------------------|------------------------------|----------|
| Management Committee of Mount Sanqingshan National Park | +86-793-8225817 | 8 Xinyang Road, Shangrao | 334000 |
| Shangrao Construction Bureau | +86-0793-8223196 | 42 Gandongbei Road, Shangrao | 334000 |
| Shangrao Environmental Protection Bureau | +86-0793-8316268 | 16 Gandongbei Road, Shangrao | 334000 |
| Shangrao Water Conservancy Bureau | +86-0793-8307112 | 116 Wusan Avenue, Shangrao | 334000 |
| Shangrao Bureau of Land and Resources | +86-0793-8261366 | 10 Daihu Road, Shangrao | 334000 |
| Shangrao Forestry Bureau | +86-0793-8293631 | 69 Shengli Road, Shangrao | 334000 |
| Shangrao Meteorological Observatory | +86-0793-8293768 | 1 Douya Lane, Shangrao | 334000 |
| Animal and Plant Quarantine Institute of Shangrao | +86-0793-8293631 | 69 Shengli Road, Shangrao | 334000 |
| Shangrao Tourism Bureau | +86-0793-8220290 | Zhongshan Road, Shangrao | 334000 |

6.c Results of Previews Reporting Exercises

Table 6.3 Results from the monitoring of the heritage of the nominated site

| Name | Content | Done by | Publisher or storage place of the materials |
|--|---|--|--|
| Scenery photography album | Geology, landform and human culture landscape | Wang Xiaofeng | Management Committee of Mount Sanqingshan National Park |
| Comprehensive Investigation Report on Mount Sanqingshan National granite Peak Forest Geopark of Jiangxi Province | Comprising: a comprehensive investigation and assessment of the geological background and characteristics of the main geological remains of the nominated property, evaluation on scientific value and aesthetic value of the granite geology, a study on the conditions and processes of landform evolution, comparative study and assessment of the Sanqingshan landscape with other world property, the compilation of a map of micro-landform landscape distribution; discussion on the ways of protection and utilization. | Liu xiyuan Ma zhengxin Yin Guosheng Yang yongge Zhang Yongzhong etc. | Jiangxi Provincial Geology Survey |
| Investigations of Mount Sanqingshan forest resources | Having made an overall record of rare and endangered plants, including each plant's distribution pattern and biological chain, as well as the characteristics of the biological chain at the nominated property, and the influence from pests on plantations | Jiangxi Provincial Forestry Investigation and Design Academy | Jiangxi Provincial Forestry Investigation and Design Institute |

Continued table 6.3 Results from the monitoring of the heritage of the nominated property

| Name | Content | Done by | Publisher or storage place of the materials |
|--|---|--|---|
| Report on Current Situation of Eco-environment of Mount Sanqingshan National Park | Having completed a comprehensive investigation and assessment on climate, land exploitation, natural disaster, plantation, biodiversity, the aquatic environment, the energy structure at the rural area, and trend of disease and insect damage on forest and crops, which indicates a sound eco-environment in the nominated property | Shangrao Environmental Protection Bureau | Shangrao Environmental Protection Bureau |
| Report on Investigation and Assessment of Resources at Mount Sanqingshan National Park | Having done a comprehensive and systematic investigation of the resources, including analysis of current resources, comprehensive evaluation and aesthetic study of landscape resources, compiled a landscape distribution map, and explored measures and plans in nursing and using plantation. | Jiangxi Provincial Urban and City Planning Institute | Management Committee of Mount Sanqingshan National Park |

Table 6.4 Monitoring water on the location, monitoring frequency and monitoring item of surface nominated property

| No. | Location | Co-ordinate | Altitude (m) | Monitoring frequency | Monitoring item |
|-----------------|---|---|--------------|---|--|
| SW ₁ | Liushunyanxia, Peak Yujing Scenic Area | east longitude:118,003.688' north latitude:28,054.349' | 1,404 | One Monitoring during 1989~90, From 2000~2005 one for each year, each measurement undertaken twice daily every 2 days | PH CODcrBOD5 DOAmmonia nitrogene,total P, oils |
| SW ₂ | Xiaoyao Tangshenshan, Peak Yujing Scenic Area | east longitude:118,003.204' north latitude:28,054.745' | 1,616 | | |
| SW ₃ | Waishuangxi Water Supply Factory | east longitude:118,003.499' north latitude:28,053.002' | 644 | | |
| SW ₄ | Xiangpo Bridge | east longitude:118,003.965' north latitude:28,052.569' | 465 | | |
| SW ₅ | Xiakou reservoir | east longitude:118,008.306' north latitude:28,043.162' | 131 | | |
| SW ₆ | Minhong Hotel | east longitude:118,004.112' north latitude:28,054.120' | 251 | | |
| SW ₇ | Fenshui hotel | east longitude:118,003.104' north latitude:28,054.120' | 111 | | |

Table 6.5 Surface water monitoring result of the nominated property from 1989 to 2005

| No. | Monitoring item | Monitoring data (mg/L) | | Level III of standard limiting value(mg/L) |
|-----------------|--------------------|------------------------|----------------|--|
| | | Range | Annual average | |
| SW ₁ | pH | 6.00–8.05 | / | 6–9 |
| | DO | 9.02–10.90 | 10.05 | ≥5 |
| | oils | <0.01 | <0.01 | ≤0.05 |
| | NH ₃ –N | 0.025–0.037 | 0.030 | ≤1.0 |
| | BOD ₅ | 2–2.63 | 2.2 | ≤4 |
| | Total P | <0.025 | <0.025 | ≤0.2 |
| | COD _{cr} | 5–5.9 | 5.3 | ≤20 |
| SW ₂ | pH | 6.07–8.09 | / | 6–9 |
| | DO | 9.0–10.9 | 10.1 | ≥5 |
| | oils | <0.01 | <0.01 | ≤0.05 |
| | NH ₃ –N | 0.025–0.039 | 0.030 | ≤1.0 |
| | BOD ₅ | 2–2.35 | 2.1 | ≤4 |
| | Total P | <0.025 | <0.025 | ≤0.2 |
| | COD _{cr} | 5–5.9 | 5.3 | ≤20 |
| SW ₃ | pH | 6.10–8.14 | / | 6–9 |
| | DO | 9.3–10.9 | 10.2 | ≥5 |
| | oils | <0.01 | <0.01 | ≤0.05 |
| | NH ₃ –N | 0.022–0.069 | 0.044 | ≤1.0 |
| | BOD ₅ | 2.1–2.76 | 2.35 | ≤4 |
| | Total P | <0.025 | <0.025 | ≤0.2 |
| | COD _{cr} | 5–5.9 | 5.3 | ≤20 |
| SW ₄ | pH | 6.68–8.69 | / | 6–9 |
| | DO | 8.34–10.2 | 9.24 | ≥5 |
| | oils | <0.01 | <0.01 | ≤0.05 |
| | NH ₃ –N | 0.025–0.031 | 0.026 | ≤1.0 |
| | BOD ₅ | 2.13–2.69 | 2.52 | ≤4 |
| | Total P | 0.025–0.066 | 0.044 | ≤0.2 |
| | COD _{cr} | 5–5.94 | 5.35 | ≤20 |
| SW ₅ | pH | 6.67–8.68 | / | 6–9 |
| | DO | 8.0–10.1 | 8.91 | ≥5 |
| | oils | <0.01 | <0.01 | ≤0.05 |
| | NH ₃ –N | 0.025–0.042 | 0.031 | ≤1.0 |
| | BOD ₅ | 2.31–2.97 | 2.79 | ≤4 |
| | Total P | 0.034–0.058 | 0.052 | ≤0.2 |
| | COD _{cr} | 5–5.8 | 5.35 | ≤20 |
| SW ₆ | pH | 6.51–8.14 | / | 6–9 |
| | DO | 8.60–10.3 | 9.78 | ≥5 |
| | oils | <0.01 | <0.01 | ≤0.05 |
| | NH ₃ –N | 0.025–0.058 | 0.030 | ≤1.0 |
| | BOD ₅ | 2.01–3.23 | 2.71 | ≤4 |
| | Total P | 0.036–0.089 | 0.071 | ≤0.2 |
| | COD _{cr} | 5.2–5.9 | 5.6 | ≤20 |
| SW ₇ | pH | 6.13–8.13 | / | 6–9 |
| | DO | 7.96–9.99 | 8.86 | ≥5 |
| | oils | <0.01 | <0.01 | ≤0.05 |
| | NH ₃ –N | 0.024–0.047 | 0.028 | ≤1.0 |
| | BOD ₅ | 2.03–3.59 | 2.98 | ≤4 |
| | Total P | 0.037–0.093 | 0.075 | ≤0.2 |
| | COD _{cr} | 5.1–7.8 | 6.0 | ≤20 |

note:pH zero dimension

Table 6.6 Ambient air monitoring results of the nominated property from 1989 to 2005

(unit mg/m³ stand)

| Year | SO ₂ | | NO ₂ | | PM ₁₀ | |
|---------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|
| | Daily average range | Annual average value | Daily average range | Annual average value | Daily average range | Annual average value |
| 1989–1991 | <0.015–0.028 | 0.012 | <0.014–0.034 | 0.019 | 0.032–0.050 | 0.033 |
| 1992–1994 | <0.015–0.025 | 0.012 | <0.004–0.016 | 0.012 | 0.011–0.044 | 0.028 |
| 1995–1997 | <0.015–0.028 | 0.014 | <0.004–0.032 | 0.016 | 0.012–0.043 | 0.028 |
| 1998–1999 | <0.015–0.030 | 0.015 | <0.014–0.022 | 0.016 | 0.014–0.050 | 0.032 |
| 2000 | <0.015–0.023 | 0.013 | <0.004–0.022 | 0.013 | 0.021–0.051 | 0.036 |
| 2001 | <0.015–0.031 | 0.015 | <0.004–0.034 | 0.020 | 0.014–0.050 | 0.036 |
| 2002 | <0.015–0.033 | 0.017 | <0.004–0.029 | 0.017 | 0.011–0.051 | 0.033 |
| 2003 | <0.015–0.026 | 0.015 | <0.004–0.034 | 0.018 | 0.015–0.050 | 0.034 |
| 2004 | <0.015–0.031 | 0.014 | <0.004–0.022 | 0.015 | 0.014–0.050 | 0.035 |
| 2005 | <0.015–0.030 | 0.013 | <0.005–0.017 | 0.008 | 0.022–0.048 | 0.031 |
| level I of standard | 0.05 | 0.02 | 0.08 | 0.04 | 0.05 | 0.04 |

Table 6.7 Noise Monitoring result from 1989 to 2005 of the nominated property

Equivalent acoustical level: Leq[dB(A)]

| Year | Leq (daytime) | Leq (night) |
|------------------------------------|---------------|-------------|
| 1989-1991 | 41.3 | 30.6 |
| 1992-1994 | 42.5 | 32.2 |
| 1995-1997 | 45.7 | 36.1 |
| 1998-1999 | 44.6 | 35.5 |
| 2000 | 41.5 | 33.0 |
| 2001 | 41.7 | 32.2 |
| 2002 | 42.8 | 35.7 |
| 2003 | 42.5 | 35.8 |
| 2004 | 40.2 | 34.0 |
| 2005 | 42.9 | 35.7 |
| level I of standard limiting value | 55 | 45 |

Table 6.8 Monitoring location, monitoring frequency and monitoring items of soil types of the nominated property

| No. | Location | Coordinate | Altitude (m) | Monitoring frequency | Monitoring item |
|----------------|-----------------|---|--------------|---|---|
| S ₁ | Sanlong village | east longitude:118° 03.676' north latitude:28° 54.275' | 1,250 | Sampling once in 2000, Sampling once in 2005 | pH value, copper, lead, zinc, cadmium, nickel, chrome, mercury, arsenic |
| S ₂ | Tiyun ridge | east longitude:118° 03.652' north latitude:28° 54.120' | 1,000 | | |
| S ₃ | Qingyun village | east longitude:118° 03.499' north latitude:28° 53.002' | 650 | | |
| S ₄ | Xiangpo bridge | east longitude:118° 03.986' north latitude:28° 52.462' | 400 | | |

Table 6.9 Monitoring result of soil types of the nominated property

| Altitude (m) | Soil type | Criterion No. | Monitoring result (mg/kg) except pH | | | | | | | Date: December 18, 2000 | |
|-----------------------------------|------------------------|---------------|-------------------------------------|--------|--------|---------|---------|-------|---------|-------------------------|------|
| | | | Copper | Nickel | Chrome | Arsenic | Mercury | Lead | Cadmium | Zinc | pH |
| 1250 | Meadow soil | S1 | 9.80 | 3.80 | 18.00 | 5.40 | 0.05 | 62.20 | 0.15 | 45.00 | 5.25 |
| 1000 | Yellow brunisolic soil | S2 | 6.10 | 3.30 | 11.00 | 3.95 | 0.17 | 61.00 | 0.11 | 31.60 | 5.20 |
| 650 | Yellow soil | S3 | 4.85 | 4.20 | 16.60 | 6.50 | 0.15 | 54.30 | 0.14 | 46.80 | 5.70 |
| 400 | Red soil | S4 | 49.60 | 26.50 | 37.85 | 8.27 | 0.14 | 41.00 | 0.11 | 85.00 | 5.35 |
| 1250 | Meadow soil | S1 | 9.90 | 3.70 | 17.50 | 5.30 | 0.05 | 62.10 | 0.16 | 45.20 | 5.35 |
| 1000 | Yellow brunisolic soil | S2 | 6.20 | 3.40 | 11.10 | 3.75 | 0.16 | 60.00 | 0.12 | 30.90 | 5.40 |
| 650 | Yellow soil | S3 | 4.80 | 4.30 | 16.50 | 6.40 | 0.17 | 53.10 | 0.16 | 46.20 | 5.85 |
| 400 | Red soil | S4 | 48.80 | 26.40 | 37.55 | 8.26 | 0.15 | 41.30 | 0.13 | 85.60 | 5.75 |
| Secondary standard limiting value | | | 50 | 40 | 250 | 30 | 0.30 | 250 | 0.30 | 200 | <6.5 |

7. DOCUMENTATION

- 7.a Photographs, Slides, Image Inventory and Authorization Table and Other Audiovisual Materials
- 7.b Texts Relating to Protective Designation
- 7.c Form and Date of Most Recent Records or Inventory of Property
- 7.d Address where Inventory, Records and Archives are Held
- 7.e Bibliography

7. DOCUMENTATION

7.a Photographs, Slides, Image Inventory and Authorization Table and Other Audiovisual Materials

(i) 35mm slides

50 (see Annex IV)

(ii) DVD

1 (DVD, 15min, see Annex IV)

(iii) Photo Album

1 (Paper Media 1; DVD 1, 300dpi, jpg format, see Annex IV)

(iv) Authorization (for usage) table of photo and audiovisual materials

Table 7.1 Authorization for usage of photo and audiovisual materials

| ID NO. | Format(slide/print/video) | Caption | Date of Photo (/yr) | Photographer, Director of Video | Copyright owner (if different than photo-grapher/Director of Video) | Contact details of copyright owner (Name, Address, Tel, Fax, Email) | Nonexclusive cession rights |
|--------|---------------------------------------|-------------------------------|---------------------|--|---|---|-----------------------------|
| 1 | 35mm slides | Sanqingshan Granite Ecosystem | 2004 | Wang Xiaofeng Deng Yong, Ouyang Ping | Jiangxi Construction Department&SAC | Wang Xiaofeng sqswb@126.com | Permitted usage |
| 2 | 15min DVD | Sanqingshan Granite Ecosystem | 2005 | Liu Yi | Sanqingshan Management Committee | Peng Cheng sq373PC@163.com | Permitted usage |
| 3 | Photo album | Sanqingshan Granite Ecosystem | 2005 | Wang Xiaofeng Deng Yong, Ouyang Ping | Jiangxi Construction Department&SAC | Wang Xiaofeng sqswb@126.com | Permitted usage |
| 4 | Electr.photo album,300dpi, jpg format | Sanqingshan Granite Ecosystem | 2005 | Wang Xiaofeng Deng Yong, Ouyang Ping | Jiangxi Construction Department&SAC | Wang Xiaofeng sqswb@126.com | Permitted usage |
| 5 | Photo album 300dpi, jpg format | Geologic Landform Remains | 2005 | Yin Guosheng Ma Zhenxing | Geologic Survey of Jiangxi Prov | Ma Zhenxing | Permitted usage |
| 6 | Photo album 300dpi, jpg format | Rare Animals & Plants | 2005 | Guo Yingrong | Jiangxi Forestry Department | Guo Yingrong | Permitted usage |

7.b Text Relating to Protective Designation

(i) Content of protective designation

Scenic Zone: A Scenic Zone is an area where the natural environment is at its most beautiful, with clustered scenery spots and easy access for tourists. These zones are delimited, designated and approved by People's Government (County Government or higher rank) to provide the public with opportunities for travelling, sightseeing, recreation and undertaking scientific and cultural educational activities.

National Park: Is a State-ranking protected area and managed mainly for protection of ecosystem, landscape and recreation. It is approved by the State Council.

National Geopark: A National Geopark is a natural area of state-level specific geoscientific significance, where geological remains of scientific and aesthetic value are dominant, but integrated with other natural and human landscapes to form a distinctive character. Its designation is approved by Ministry of Land and Resources.

(ii) Copies of property protection and management plans

The property protection and management plans for nominated site are contained in Appendix 1.

(iii) Extracts of other plans relevant to the property

· **Jiangxi Province Tenth "Five-year" Social Economy Development Plan and Perspective Program (2000-2020)** Article 3&7: (To protect cultural and natural heritage of Jiangxi Province)

· **Shangrao City Tenth "Five-year" Social Economy Development Plan and Perspective Program (2000-2020)** Article 3, 5& 7: (To protect resources of Sanqingshan National Park Scenic Zone, improve the ecological environment and develop tourism)

· **General Plan of Mount Sanqingshan National Park, Jiangxi Province (2003-2020)** Article 45-48: (According to the value of resources to implement graded conservation: special, grade I, grade II, grade III, putting the natural resources under Core Scenic Area conservation)

· **Jiangxi Province Municipal System Plan (2005-2020)** Article 7&10: (to promote the development of Mount Sanqingshan National Park etc, intensify conservation of the ecological environment and strengthen development of tourism - to assist Shangrao City to be the tourism centre for the provinces of Jiangxi, Zhejiang and Fujian.)

· **Shangrao City Municipal System Plan (2003-2020)** Using constructive development model (composition of networked plate with dots and axes), incorporate Mount Sanqingshan into Wu-De-Sanqing plate, including Wuyuan, eastern Dexing Mount Sanqingshan tourist zones, and strengthen conservation of tourism resources and ecosystem, strictly examine construction projects.

· **Shangrao City Tourism Development Programme (2000-2020)** Aiming at the goal of "to build first rate national and world famous elite scenic zone", in accordance with the model "travelling up mountain, living down the hill; travelling scenic area, living in town." Promote the construction of Shangrao municipality, county town of Wuyuan and Yushan, make them back the Mount Sanqingshan tourism development and

assist them to be excellent tourist cities.

- **Yushan County Tourism Development Programme (2005-2020)** Promote the tourism function of the county town, build it into a tourist reception and tourist transition centre, create a nationally excellent tourist city.
- **Dexing City Tourism Development Programme (2001-2020)** Building Dexing-Mount Sanqingshan copper mine industrial culture and ecological zone.
- **General Plan of Mount Sanqingshan Granite Peak Forest National Geopark, Jiangxi Province**, has demarcated the division of geological remains and geological landscape functional areas, elaborated specific requirements for vegetation conservation and scientific research, planned the scale and functional layout of the museum.
- **Report on Yushan-Mount Sanqingshan Tourist Corridor Development and Arrangement**, has designed 4 main tourist experience areas, parted the tour area from service area to realize “Travelling up mountain, living down the hill” with a goal of developing the Yushan-Mount Sanqingshan Tourist Corridor into a multi-functional, beautiful landscape and environment, an all-round attraction, promoting sustainable development, a recreation tourism reception area, and ensuring the conservation of resources of Mount Sanqingshan National Park.

7.c Form and Date of Most Recent Records or Inventory of Property

(i) Form and date of most recent records

Table 7.2 Form and date of most recent records of the nominated property

| Property | Most recent records | Date |
|------------------------------|--|------|
| Mt Sanqingshan National Park | Landscape survey and assessment report of Mt.Sanqingshan | 1986 |
| | Landscape survey and assessment report of Mt. Sanqingshan | 1993 |
| | Landscape survey and assessment report of Mt. Sanqingshan | 2003 |
| | Forest resources survey results of Mt. Sanqingshan | 2004 |
| | Outline of Mt.Sanqingshan Natural heritage | 2005 |
| | Comprehensive investigation report of Mt. Sanqingshan Granite Peak Forest National Geopark | 2005 |

(ii) Inventory of Property

Table 7.3 Granite geology and landform remains of the nominated property

Table 7.4 E.Asia & Amer. disjunct distribution Genera of plants in the nominated property

Table 7.5 Species belonging to the genera endemic to China in the nominated property

Table 7.6 Endemic plant Species to China in the nominated property

Table 7.7 Rare Species of plants in the nominated property

Table 7.8 Rare Species of animals in the nominated property

Table 7.9 Main scenic spots of the nominated property

Table 7.3 Granite geology and landform remains of the nominated property

| No. | Coordinates | Type | Name | Main characteristics | Conserv. state | Record time |
|-----|---|----------------------------|-----------------------------------|---|----------------|-------------|
| 1 | 118° 03' 52.3" E 28° 54' 57.5" N (Pk. Yujing) | Overlapped peak | Three Ancestors of Taoism | Peak Yujing is the highest peak in Mount Sanqingshan, with an elevation of 1,816.9m, Peak Yuxu close to N side of Peak Yujing w/elevation 1,776m, Peak Yuhua aligned with Peak Yuxu w/elevation 1,752m. These three peaks rise up to the clouds to form pyramid-like overlapped summit, just like three ancestors of Taoism: Yuqing, Shangqing and Taiqing - hence the name | Original state | 2004 |
| 2 | 118° 03' 12.6" E 28° 54' 46.4" N (north viewing platform) | Peakwall | Great Wall in heaven | To the north of Gangwan, Xihai, the peak wall looks like Chinese Great Wall extending in 200°~205° for >100m, and 15m thick, 60m high, vertical, w/flat surface, the peak wall is a well preserved granite landform - hence the name. | Original state | 2004 |
| 3 | 118°03' 50.5" E 28° 54' 28.6" N | Peak wall | Wanhuchao-tian | With elevation 1,350 m, height difference 200m made up of seven vertical peak pillars. It formed, as a granite body cut by EW and N-S vertical joints, further subjected to weathering, denuding and scouring. | Original state | 2004 |
| 4 | 118°03' 41.2" E 28°54' 11.5" N | Peak cluster | Peak Cluster at Heavenly Gate | Cluster of parallel peaks, rugged and slender, connected at bottom and spire-shaped at top, with diameter at bottom 5m~40m, height 20m~100m, The two main peaks in centre, rise up to touch cloud, like a gigant gate, hence the name. | Original state | 2004 |
| 5 | 118°03' 57.4" E 28°54' 15.5" N | Peak cluster | Peak Cluster at Qiongtai Platform | With an elevation of 1,750m, peak clusters spread parallel in N-S direction, peak body is 50~100m thick, height difference 40-200m. | Original state | 2004 |
| 6 | 118°03' 58.3" E 28° 54' 30.8" N | Peak pillar Pict. stone | Oriental Goddess | With an elevation of 1,182m, rising to 86m, granite cut by two sets of vertical joint to form pillar peak, further subjected to horizontal joint cutting and collapsing to form two sections, still further subjected to weathering and denuded to form a figure of a goddess, remarkably true to life | Original state | 2004 |

Continued table 7.3 Granite geology and landform remains of the nominated property

| No. | Coordinates | Type | Name | Main characteristics | Conserv. state | Record time |
|-----|--|----------------------------|--------------------------------|--|----------------|-------------|
| 7 | 118°03' 51.2" E 28°54' 51.2" N | Peak Pillar Pict.stone | Gigantic Boa | It has an elevation of 1,200m, height 128m, diameter 7~10m. The granite, cut by joints to form N-S strike peak wall, then cut by E-W joints to form peak pillar - "Boa's bod" - further subjected to scouring, collapse, weathering and denudation to form "Gigantic Boa". | Original state | 2004 |
| 8 | 118°03' 51.4" E 28°54' 19.2" N (Yu emperor's platform) | Peak Pillar | Guanying Enjoys Melody | Located 50m northwest of Yu Emperor's summit. Guanying sitting on a stone pillar, 50m high, diameter at bottom 20m, at top 8m, Guanying is 15m high. | Original state | 2004 |
| 9 | 118°03' 51.2" E 28°54' 51.2" N | Peak Pillar Pict.stone | Leopard Cat Waiting for Mouse | "Cat" 40m high, 3-4m waist, 3 × 5m head. Granite cut by NE, NNE joints to form peak pillar, further developed into pictographic stone | Original state | 2004 |
| 10 | 118°03' 49" E 28°54' 23.1" N | Peak Pillar Pict.Stone | Gehong Makes Pills of Immortal | Sitting Gehong 1.6m high, with the pill 0.4m big, peak pillar 25m high. | Original state | 2004 |
| 11 | 118°03' 38.1" E 28°54' 20.4" N | Peak Pillar Pict.Stone | Jad Rabbit Running to Moon | Rabbit 3m long, 2.5m high, sitting atop a peak pillar 40m high. | Original state | 2004 |
| 12 | 118°03' 38.1" E 28°54' 20.4" N | Peak Pillar Pict. Stone | Fairy and Shoe | The "Shoe" is a figurative landscape on top of a pillar, 2.5-3m long, 1.5m high, peak pillar 70m high, 8-10m D. | Original state | 2004 |
| 13 | 118°03' 49.7" E 28°54' 17.4" N | Peak Pillar | Hand Hey Cutter | Cutter 6m wide, 30m long, N-S trending peak wall cut by EW vertical joints and fractures, further weathered, denuded to form peak pillar. | Original state | 2004 |
| 14 | 118°03' 22.3" E 28°54' 22.5" N | Peak Pillar Pict.Stone | Youngster struggles For hegem | Peak pillar 20m high, 5m D, a "cap" with 6m D developed atop the pillar. | Original state | 2004 |
| 15 | 118°03' 51.2" E 28°54' 51.2" N | Peak Pillar Pict.Stone | Penguin & Peach | The figure 40m high, waist 3-4m, head 3 × 5m. 3 sets of joint developed: EW, NS and horizontal. | Original state | 2004 |

Continued table7.3 Granite geology and landform remains of the nominated property

| No. | Coordinates | Type | Name | Main characteristics | Conserv. state | Record time |
|-----|-------------------------------------|---------------------------|---------------------------------|--|----------------|-------------|
| 16 | 118° 03' 12.6" E 28° 54' 46.4" N | Peak Pillar Pict.Stone | King-Monkey Presenting Treasure | Peak pillar 7m high, waist 4m, nearest pillar 3m high, inverted gourd like, pictographic stone formed by joint cutting, weathering and collapsing. | Original state | 2004 |
| 17 | 118° 03' 10.0" E 28° 54' 20.4" N | Peak Pillar Pict.Stone | Guanying enjoying music | Granite cut by two sets of joints, further weathered, denuded to form two pillars, one 10m high, 1m D., another 2m | Original state | 2004 |
| 18 | 118° 03' 37.7" E 28° 54' 13.4" N | Peak Pillar | Peak Scabbard | Landscape includes 9 scabbard like peak pillars, 40~60m high, 3~10m D, arranged in NNW direction, striking 350°. | Original state | 2004 |
| 19 | 118° 03' 13.0" E 28° 54' 28.0" N | Peak Pillar Pict.Stone | Mazhu Bust | The landscape formed by leaching, weathering and denuding of a pillar, surrounded by other peak pillars. | Original state | 2004 |
| 20 | 118° 03' 14.6" E 28° 55' 42.7" N | Peak Pillar Pict.Stone | Celest. Turtle Searching Sea | Pictographic stone 4.5m long, 3m high, standing on pillar 2m high. Granite cut by two sets of joint, subjected to leaching, weathering to form pillar, further through spheroidal weathering transfers to bullion. | Original state | 2004 |
| 21 | 118° 03' 47" E 28° 54' 06" N | Peak Pillar Pict.Stone | Old Taoist Worships Moon. | Peak pillar 60m high, 10m high, cut by joints, weathered, denuded and leached to form pictographic stone. | Original state | 2004 |
| 22 | To southwest of Yuling Nunnery | Stone Forest | Yuling Stone Forest | Small scale prism like peaks, 10-20m high, 8-12m D, majestic and straight. Granite cut by NS and EW trending joints, weathered and scoured to form the landscape. | Original state | 2004 |
| 23 | 118° 03' 48" E 28° 54' 07" N | Pict.Stone | Rhinocer Stone | Landscape 40m high, 20m wide. The landscape controlled by 3 sets of joint: 270D90, 195D85 and 300D30, the former two developed, later are scarce. | Original state | 2004 |
| 24 | 118° 03' 48" E 28° 54' 06" N | Pict.Stone | Delu Platform | Landscape 15m high, 10m wide, 10m long. From here one can admire Nanqingyuan Scenic Area and Wanshouyuan Scenic Area. | Original state | 2004 |
| 25 | 118° 03' 47" E 28° 54' 05" N | Pict.Stone | Crane Summit | Peak pillar 10m high, 5m D, peak pillar and pictographic stone controlled by three sets of joint. | Original state | 2004 |

Continued table 7.3 Granite geology and landform remains of the nominated property

| No. | Coordinates | Type | Name | Main characteristics | Conserv. state | Record time |
|-----|-------------------------------------|-------------|---------------------------|--|----------------|-------------|
| 26 | 118° 03' 14.6" E 28° 55' 42.7" N | Pict. Stone | Bottle Gourd Stone | A rounded granite columnar, 8.5m high, divided into two parts, forming two big balls, both with diameter about 3.6m, linked with granite column. Granite cut by NS and EW joints to form peak pillar, then subjected by horizontal cutting, collapsing, weathering and denuding to form bullion. | Original state | 2004 |
| 27 | 118° 03' 26.0" E 28° 54' 14.2" N | Cliff | Xihai Stone Wall | Granite body, processed by faulting, joint cutting and gravity collapsing to form the cliff wall, which strikes NE, extending to >2,000m, w/height difference 600-800, locally forming hanging cliff. | Original state | 2004 |
| 28 | 118° 03' 42.7" E 28° 54' 10.6" N | Gorge | Feixian Gorge | Striking in NS direction, 2,500m long, V- shaped, mostly embodied by steep cliffs on both side, 200m-300m. | Original state | 2004 |
| 29 | 118° 03' 51.2" E 28° 54' 51.2" N | Gorge | A Ray of Sky | Gorge 100m deep, the slope 120m long, only 0.7m-1m wide, striking 265°, a set of joints perpendicular to gorge observed on both side. | Original state | 2004 |
| 30 | 118° 03' 54.7" E 28° 54' 21.2" N | Gorge | Gorge with a Ray of Light | At elevation of 1,500m, gorge 29m long, 0.6m-1.3m wide, 50m deep, cliff wall dips to west at 80°. | Original state | 2004 |
| 31 | 118° 03' 49" E 28° 54' 23.1" N | Gorge | Fushou Gate | Scenic spot formed between two stone peaks, Gate 4.2m wide, 25m high, in gate was built a door 1m wide, with door frame column 1.2m wide, 13m high. | Original state | 2004 |
| 32 | 118° 03' 26.0" E 28° 54' 14.2" N | Gorge | Xihai Gate | Gorge NS trending, 15m wide, western column 30m high, eastern column 45m high, NNE and NE trending joint cutting, made up gorge and peak pillars. | Original state | 2004 |
| 33 | 118° 00' 15" E 28° 52' 59" N | Waterfall | Baji, Longtan Fall | Waterfall 30m high, cliff 30m wide, controlled by three sets of fractures. | Original state | 2004 |
| 34 | 118° 05' 30" E 28° 55' 45" N | Waterfall | Jade Girl's Pond | Located to east of Jingsha at intersection of fracture and joint. Rocks like a girl dressing up, water spray dropping from cliff like long graceful hair, the pond as clear as mirror. | Original state | 2004 |
| 35 | 118° 05' 11" E 28° 55' 25" N | Waterfall | Bingyu Cave | Fall 20m high. An EW fracture cuts the peak to form a cave 2m high, 10m deep. Water spray like curtain for the cave, dropping down into the funnel-like deep pond with area 20 m ² . | Original state | 2004 |

Continued Table7.3 Granite geology and landform remains of the nominated property

| No. | Coordinates | Type | Name | Main characteristics | Conserv. state | Record time |
|-----|---------------------------------|-------------------|-------------------|---|----------------|-------------|
| 36 | 118° 03' 47" E 28° 52' 49" N | Structure | Schistosity Zone | Original structure destroyed, tectonic schist greyish-green, schistosity zone 12m wide, with occurrence 350D55. Early compression activity was replaced by later tectonic extension. In the zone tectonic breccias, jade and epidotite observed. | Original state | 2004 |
| 37 | 118° 03' 54" E 28° 52' 44" N | Structure | Schistosity Zone | The zone 5m-8m, trending in 1,600 with 1m wide mylonite belt at middle w/occurrence 80D80; tectonic schist on both side w/occurrence of schistosity 240D70. Foliation in fine grained porphyroid biotite adamelite developed. | Original state | 2004 |
| 38 | Jingsha Highway | Structure | Jingsha Fault | Trending in NW, dips NE at 65°-70°, the fault formed by compression shearing at early stage to form schistous granite, and extensional at later stage to form tectonic breccias and silicalite. | Original state | 2004 |
| 39 | 118° 04' 02" E 28° 52' 36" N | Intrusive Contact | Residual Cover | At N fine grained porphyroid biotite granite with developed eoliation. At S Cambrian Xiyangshan formation (Є 3O1x banded limestone w/carbonaceous mudstone, silty shale.occurence: 135D45. Trilobite and benthic brachiopoda fossils seen. | Original state | 2004 |
| 40 | 118° 04' 10" E 28° 52' 24" N | Structure | Anticline | At core of anticline medium-thick layered silicalite, thin-medium layered limestone w/argilic bands, at flanks nodular argillaceous limestone, silicalite. Anticline axis pitching to N, dips 110° at D25°. At north flank strata 340°D40°. | Original state | 2004 |
| 41 | 118° 02' 07" E 28° 57' 01" N | Contact Relat. | Intrusive Contact | Micro-fine grained phenocryst-bearing to porphyroid biotite adammelite at south, Cambrian Hetang Formation (Є 1h) banded silicalite, carbonaceous and siliceous shale, silicalite w/ siliceous limestone w/ occurrence: 140°D45°. Contact w/ intrusive rocks: 170°D55°. | Original state | 2004 |

Table 7.4 E.Asia & Amer. disjunct distribution Genera of plants in the nominated property

| No. | Genera | Status of growth | East Asia (China)(species) | North America (species) | Distribution | Recorded date |
|-----|---------------------|------------------|----------------------------|-------------------------|-----------------|---------------|
| 1 | <i>Abelia</i> | Well | 9 | 20 | Mt. Sanqingshan | 2004 |
| 2 | <i>Acorus</i> | Well | 4(3) | 2 | Mt. Sanqingshan | 2004 |
| 3 | <i>Aletris</i> | Well | 15(13) | 6 | Mt. Sanqingshan | 2004 |
| 4 | <i>Ampelopsis</i> | Well | 17(13) | 13 | Mt. Sanqingshan | 2004 |
| 5 | <i>Amphicarpaea</i> | Well | 1(1) | 1 | Mt. Sanqingshan | 2004 |
| 6 | <i>Aralia</i> | Well | 30(25) | 10 | Mt. Sanqingshan | 2004 |
| 7 | <i>Apios</i> | Well | 6 | 4 | Mt. Sanqingshan | 2004 |
| 8 | <i>Astilbe</i> | Well | 12 | 2 | Mt. Sanqingshan | 2004 |
| 9 | <i>Antenoron</i> | Well | 2 | 2 | Mt. Sanqingshan | 2004 |
| 10 | <i>Agastache</i> | Well | 1 | 8 | Mt. Sanqingshan | 2004 |
| 11 | <i>Berchemia</i> | Well | 18(16) | 13 | Mt. Sanqingshan | 2004 |
| 12 | <i>Campsis</i> | Well | 1 | 1 | Mt. Sanqingshan | 2004 |
| 13 | <i>Carya</i> | Well | 4 | 15 ± | Mt. Sanqingshan | 2004 |
| 14 | <i>Castanopsis</i> | Well | 120 ± (63) | 2 ± | Mt. Sanqingshan | 2004 |
| 15 | <i>Catalpa</i> | Well | 4 | 7 | Mt. Sanqingshan | 2004 |
| 16 | <i>Cephalanthus</i> | Well | 1 | 5 | Mt. Sanqingshan | 2004 |
| 17 | <i>Chamaerhodos</i> | Well | 5 | 3 | Mt. Sanqingshan | 2004 |
| 18 | <i>Chimonanthus</i> | Well | 4 | 3 | Mt. Sanqingshan | 2004 |
| 19 | <i>Cladrastis</i> | Well | 5 | 1 | Mt. Sanqingshan | 2004 |
| 20 | <i>Diphylleia</i> | Well | 2 | 1 | Mt. Sanqingshan | 2004 |
| 21 | <i>Disporum</i> | Well | 14 | 6 | Mt. Sanqingshan | 2004 |
| 22 | <i>Eomecon</i> | Well | 2 | 3 | Mt. Sanqingshan | 2004 |
| 23 | <i>Gleditsia</i> | Well | 10(6) | 4 | Mt. Sanqingshan | 2004 |
| 24 | <i>Gymnocladus</i> | Well | 4 | 1 | Mt. Sanqingshan | 2004 |
| 25 | <i>Halesia</i> | Well | 1 | 2 | Mt. Sanqingshan | 2004 |
| 26 | <i>Hamamelis</i> | Well | 2 | 4 | Mt. Sanqingshan | 2004 |
| 27 | <i>Hugeria</i> | Well | 2 | 1 | Mt. Sanqingshan | 2004 |
| 28 | <i>Hydrangea</i> | Well | 45 | 35 ± | Mt. Sanqingshan | 2004 |
| 29 | <i>Hypopitys</i> | Well | 1 | 1 | Mt. Sanqingshan | 2004 |
| 30 | <i>Illicium</i> | Well | 32—(28) | 2 | Mt. Sanqingshan | 2004 |
| 31 | <i>Itea</i> | Well | 15(12) | 12 | Mt. Sanqingshan | 2004 |
| 32 | <i>Kerria</i> | Well | 1 | 1 | Mt. Sanqingshan | 2004 |
| 33 | <i>Kummerowia</i> | Well | 2 | 2 | Mt. Sanqingshan | 2004 |
| 34 | <i>Lespedeza</i> | Well | 26 | 14 | Mt. Sanqingshan | 2004 |
| 35 | <i>Lindera</i> | Well | 100(80) | 3 | Mt. Sanqingshan | 2004 |

Continued table7.4 E.Asia & Amer.disjunct distribution Genera of plants in the nominated property

| No. | Genera | Status of growth | East Asia (China)(species) | North America (species) | Distribution | Recorded date |
|-----|-----------------------|------------------|----------------------------|-------------------------|----------------|---------------|
| 36 | <i>Liquidambar</i> | Well | 2 | 3 | Mt.Sanqingshan | 2004 |
| 37 | <i>Liriodendron</i> | Well | 1 | 1 | Mt.Sanqingshan | 2004 |
| 38 | <i>Lithocarpus</i> | Well | 120(58) | 2 | Mt.Sanqingshan | 2004 |
| 39 | <i>Lyonia</i> | Well | 5 | 30 ± | Mt.Sanqingshan | 2004 |
| 40 | <i>Magnolia</i> | Well | 80(30) ± | 8 | Mt.Sanqingshan | 2004 |
| 41 | <i>Mahonia</i> | Well | 40-50 | 25 ± | Mt.Sanqingshan | 2004 |
| 42 | <i>Meehania</i> | Well | 1 | 1 | Mt.Sanqingshan | 2004 |
| 43 | <i>Menispermum</i> | Well | 2 | 2 | Mt.Sanqingshan | 2004 |
| 44 | <i>Muhlenbergia</i> | Well | 8 | 100 | Mt.Sanqingshan | 2004 |
| 45 | <i>Nelumbo</i> | Well | 1 | 1 | Mt.Sanqingshan | 2004 |
| 46 | <i>Nyssa</i> | Well | 8 | 4 | Mt.Sanqingshan | 2004 |
| 47 | <i>Osmanthus</i> | Well | 23(15) | 2 | Mt.Sanqingshan | 2004 |
| 48 | <i>Pachysandra</i> | Well | 2 | 1 | Mt.Sanqingshan | 2004 |
| 49 | <i>Parthenocissus</i> | Well | 9 | 4 | Mt.Sanqingshan | 2004 |
| 50 | <i>Penthorum</i> | Well | 1 | 1 | Mt.Sanqingshan | 2004 |
| 51 | <i>Photinia</i> | Well | 40 ± | 20 ± | Mt.Sanqingshan | 2004 |
| 52 | <i>Pieris</i> | Well | 6 | 4 | Mt.Sanqingshan | 2004 |
| 53 | <i>Phryma</i> | Well | 1 | 1 | Mt.Sanqingshan | 2004 |
| 54 | <i>Podocarpium</i> | Well | 7 | 1 | Mt.Sanqingshan | 2004 |
| 55 | <i>Pseudotsuga</i> | Well | 5 | 2 | Mt.Sanqingshan | 2004 |
| 56 | <i>Sassafras</i> | Well | 2 | 1 | Mt.Sanqingshan | 2004 |
| 57 | <i>Saurura</i> | Well | 1 | 1 | Mt.Sanqingshan | 2004 |
| 58 | <i>Schisandra</i> | Well | 25 | 1 | Mt.Sanqingshan | 2004 |
| 59 | <i>Seutera</i> | Well | 1 | 1 | Mt.Sanqingshan | 2004 |
| 60 | <i>Stewartia</i> | Well | 18 | 2 | Mt.Sanqingshan | 2004 |
| 61 | <i>Bothrocaryum</i> | Well | 1 | 1 | Mt.Sanqingshan | 2004 |
| 62 | <i>Tiarella</i> | Well | 1 | 2 | Mt.Sanqingshan | 2004 |
| 63 | <i>Torreya</i> | Well | 4 | 2 | Mt.Sanqingshan | 2004 |
| 64 | <i>Toxicodendron</i> | Well | 16 | 4 | Mt.Sanqingshan | 2004 |
| 65 | <i>Tsuga</i> | Well | 6 | 4 | Mt.Sanqingshan | 2004 |
| 66 | <i>Veronicastrum</i> | Well | 1 | 1 | Mt.Sanqingshan | 2004 |
| 67 | <i>Weigela</i> | Well | 9(2) | 1 | Mt.Sanqingshan | 2004 |
| 68 | <i>Wisteria</i> | Well | 5 | 1 | Mt.Sanqingshan | 2004 |

Table 7.5 Species belonging to the genera endemic to China in the nominated property

| No. | Genera | Species | Status of growth | Distribution | Recorded date |
|-----|----------------------|---------|------------------|----------------|---------------|
| 1 | <i>Saxiglossum</i> | 1 | well | Mt.Sanqingshan | 2004 |
| 2 | <i>Ginkgo</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 3 | <i>Pseudolarix</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 4 | <i>Pseudotaxus</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 5 | <i>Cunninghamia</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 6 | <i>Platycladus</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 7 | <i>Fokienia</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 8 | <i>Eomecon</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 9 | <i>Fortunearia</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 10 | <i>Cyclocarya</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 11 | <i>Monimopetalum</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 12 | <i>Camptotheca</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 13 | <i>Emmenopterys</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 14 | <i>Eucommia</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 15 | <i>Dysosma</i> | 2 | Well | Mt.Sanqingshan | 2004 |
| 16 | <i>Pteroceltis</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 17 | <i>Chimonanthus</i> | 3 | Well | Mt.Sanqingshan | 2004 |
| 18 | <i>Speirantha</i> | 1 | Well | Mt.Sanqingshan | 2004 |
| 19 | <i>Tapiscia</i> | 1 | Well | Mt.Sanqingshan | 2004 |

Table 7.6 Endemic plant species to China in the nominated property

| No. | Species | Status of growth | Distribution | Recorded date |
|--------------|---|------------------|----------------|---------------|
| Pteridophyta | | | | |
| 1 | <i>Dryopteris whangshanensis</i> | Well | Mt.Sanqingshan | 2004 |
| 2 | <i>Dryopteris immixta</i> | Well | Mt.Sanqingshan | 2004 |
| 3 | <i>Pyrrosia sheareri</i> | Well | Mt.Sanqingshan | 2004 |
| Gymnospermae | | | | |
| 1 | <i>Ginkgo biloba</i> | Well | Mt.Sanqingshan | 2004 |
| 2 | <i>Pseudolarix amabilis</i> | Well | Mt.Sanqingshan | 2004 |
| 3 | <i>Pseudotaxus chienii</i> | Well | Mt.Sanqingshan | 2004 |
| 4 | <i>Cunninghamia lanceolata</i> | Well | Mt.Sanqingshan | 2004 |
| 5 | <i>Pseudotsuga gaussenii</i> | Well | Mt.Sanqingshan | 2004 |
| 6 | <i>Torreya grandis</i> | Well | Mt.Sanqingshan | 2004 |
| 7 | <i>Taxus mairei</i> | Well | Mt.Sanqingshan | 2004 |
| 8 | <i>Tsuga chinensis</i> var. <i>tchekiangensis</i> | Well | Mt.Sanqingshan | 2004 |

Continued table 7.6 Endemic plant species to China in the nominated property

| No. | Species | Status of growth | Distribution | Recorded date |
|--------------|---|------------------|----------------|---------------|
| 9 | <i>Pinus taiwanensis</i> | Well | Mt.Sanqingshan | 2004 |
| 10 | <i>Pinus massoniana</i> | Well | Mt.Sanqingshan | 2004 |
| 11 | <i>Fokienia hodginsii</i> | Well | Mt.Sanqingshan | 2004 |
| 12 | <i>Juniperus formosana</i> | Well | Mt.Sanqingshan | 2004 |
| Angiospermae | | | | |
| 1 | <i>Magnolia cylindrica</i> | Well | Mt.Sanqingshan | 2004 |
| 2 | <i>Magnolia sieboldii</i> | Well | Mt.Sanqingshan | 2004 |
| 3 | <i>Liriodendron chinense</i> | Well | Mt.Sanqingshan | 2004 |
| 4 | <i>Cinnamomum japonicum</i> | Well | Mt.Sanqingshan | 2004 |
| 5 | <i>Dyosma versipellis</i> | Well | Mt.Sanqingshan | 2004 |
| 6 | <i>Coptis chinensis</i> var. <i>brevisepala</i> | Well | Mt.Sanqingshan | 2004 |
| 7 | <i>Magnolia officinalis</i> ssp. <i>biloba</i> | Well | Mt.Sanqingshan | 2004 |
| 8 | <i>Stewartia sinensis</i> | Well | Mt.Sanqingshan | 2004 |
| 9 | <i>Disanthus cercidifolius</i> var. <i>longipes</i> | Well | Mt.Sanqingshan | 2004 |
| 10 | <i>Eucommia ulmoides</i> | Well | Mt.Sanqingshan | 2004 |
| 11 | <i>Pteroceltis tatarinowii</i> | Well | Mt.Sanqingshan | 2004 |
| 12 | <i>Camptotheca acuminata</i> | Well | Mt.Sanqingshan | 2004 |
| 13 | <i>Monimopetalum chinense</i> | Well | Mt.Sanqingshan | 2004 |
| 14 | <i>Emmenopterys henryi</i> | Well | Mt.Sanqingshan | 2004 |

Table 7.7 Rare species of plants in the nominated property

| NO. | Species | IUCN Red List(2003) | China Red List | State-level Key Protection plants | Characteristics | Status of growth | Recorded date |
|-----|--|---------------------|----------------|-----------------------------------|-----------------|------------------|---------------|
| 1 | <i>Ginkgo biloba</i> | EN | EN | I | Deciduous tree | Well | 2004 |
| 2 | <i>Pseudotaxus chienii</i> | EN | VU | II | Evergreen tree | Well | 2004 |
| 3 | <i>Taxus mariei</i> | DD | VU | I | Evergreen tree | Well | 2004 |
| 4 | <i>Amentotaxus argotaenia</i> | VU | VU | | Evergreen tree | Well | 2004 |
| 5 | <i>Torreya grandis</i> | | VU | II | Evergreen tree | Well | 2004 |
| 6 | <i>Nageia nagi</i> | DD | NT | | Evergreen tree | Well | 2004 |
| 7 | <i>Cephalotaxus fortunei</i> | | VU | | Evergreen tree | Well | 2004 |
| 8 | <i>Cephalotaxus sinensis</i> | | NT | | Evergreen tree | Well | 2004 |
| 9 | <i>Pinus taiwanensis</i> | LR | NT | | Evergreen tree | Well | 2004 |
| 10 | <i>Tsuga chinensis</i> var. <i>tchekiangensis</i> | | NT | | Evergreen tree | Well | 2004 |

Continued table 7.7 Rare species of plants in the nominated property

| NO. | Species | IUCN Red List(2003) | China Red List | State-level Key Protection plants | Characteristics | Status of growth | Recorded date |
|-----|---|---------------------|----------------|-----------------------------------|----------------------|------------------|---------------|
| 11 | <i>Pseudotsuga gaussenii</i> | | VU | II | Evergreen tree | Well | 2004 |
| 12 | <i>Pseudolarix amabilis</i> | DD | NT | II | Deciduous tree | Well | 2004 |
| 13 | <i>Cryptomeria japonica</i> | | NT | | Deciduous tree | Well | 2004 |
| 14 | <i>Fokienia hodginsii</i> | LR | VU | II | Evergreen tree | Well | 2004 |
| 15 | <i>Cupressus funebris</i> | | VU | | Evergreen tree | Well | 2004 |
| 16 | <i>Platycladus orientalis</i> | LR | LC | | Evergreen tree | Well | 2004 |
| 17 | <i>Juniperus squamata</i> | | NT | | Evergreen tree | Well | 2004 |
| 18 | <i>Liriodendron chinense</i> | LR/nt | VU | II | Deciduous tree | Well | 2004 |
| 19 | <i>Magnolia officinalis</i> ssp. <i>biloba</i> | | VU | II | Deciduous tree | Well | 2004 |
| 20 | <i>Magnolia cylindrica</i> | VU | VU | | Deciduous tree | Well | 2004 |
| 21 | <i>Magnolia sieboldii</i> | | VU | | Deciduous tree | Well | 2004 |
| 22 | <i>Cinnamomum camphora</i> | | | II | Evergreen tree | Well | 2004 |
| 23 | <i>Phoebe boumei</i> | VU | LR/nt | II | Evergreen tree | Well | 2004 |
| 24 | <i>Phoebe chekiangensis</i> | VU | VU | II | Evergreen tree | Well | 2004 |
| 25 | <i>Cinnamomum japonicum</i> | LR/nt | VU | II | Evergreen tree | Well | 2004 |
| 26 | <i>Coptis chinensis</i> | | VU | II | Terraneous herb | Well | 2004 |
| 27 | <i>Dysosma versipellis</i> | VU | VU | | Terraneous herb | Well | 2004 |
| 28 | <i>Tilia oblongifolia</i> | | VU | | Deciduous tree | Well | 2004 |
| 29 | <i>Eucommia ulmoides</i> | LR | VU | II | Deciduous tree | Well | 2004 |
| 30 | <i>Chimonanthus nitens</i> | | NT | | Evergreen tree | Well | 2004 |
| 31 | <i>Chimonanthus salicifolius</i> | | VU | | Evergreen tree | Well | 2004 |
| 32 | <i>Disanthuscer cidifolius</i> var. <i>longipes</i> | | VU | II | Deciduous tree | Well | 2004 |
| 33 | <i>Semiliquidambar cathayensis</i> | LR | VU | II | Deciduous tree | Well | 2004 |
| 34 | <i>Pteroceltis tatarinowii</i> | | NT | II | Deciduous tree | Well | 2004 |
| 35 | <i>Monimopetalum chinense</i> | | VU | II | Deciduous vine shrub | Well | 2004 |
| 36 | <i>Acer amplum</i> | | NT | | Deciduous tree | Well | 2004 |
| 37 | <i>Acer buergerianum</i> | CR | LC | | Deciduous tree | Well | 2004 |
| 38 | <i>Acer yangjuechi</i> | | CR | | Deciduous tree | Well | 2004 |
| 39 | <i>Acer longipes</i> | VU | VU | | Deciduous tree | Well | 2004 |
| 40 | <i>Acer palmatum</i> | | VU | | Deciduous tree | Well | 2004 |
| 41 | <i>Acer pubipalmatum</i> | | VU | | Deciduous tree | Well | 2004 |
| 42 | <i>Acer wilsonii</i> | | VU | | Deciduous tree | Well | 2004 |

Continued table 7.7 Rare species of plants in the nominated property

| NO. | Species | IUCN Red List(2003) | China Red List | State-level Key Protection plants | Characteristics | Status of growth | Recorded date |
|-----|-----------------------------------|---------------------|----------------|-----------------------------------|------------------|------------------|---------------|
| 43 | <i>Acer wuyuanense</i> | | VU | | Deciduous tree | Well | 2004 |
| 44 | <i>Acer elegantulum</i> | | NT | | Deciduous tree | Well | 2004 |
| 45 | <i>Pieris polita</i> | | VU | | Evergreen tree | Well | 2004 |
| 46 | <i>Emmenopterys henryi</i> | | NT | II | Deciduous tree | Well | 2004 |
| 47 | <i>Halesia macgregorii</i> | VU | VU | | Deciduous tree | Well | 2004 |
| 48 | <i>Stewartia sinensis</i> | | NT | II | Deciduous tree | Well | 2004 |
| 49 | <i>Zenia insignis</i> | LR | VU | | Terraneous herb | Well | 2004 |
| 50 | <i>Juglans regia</i> | | EN | | Deciduous tree | Well | 2004 |
| 51 | <i>Camptotheca acuminata</i> | | | II | Deciduous tree | Well | 2004 |
| 52 | <i>Ceratopteris thalictroides</i> | | | II | Hydrophytic herb | Well | 2004 |
| 53 | <i>Zelkova serrata</i> | | | II | Deciduous tree | Well | 2004 |
| 54 | <i>Fagopyrum dibotrys</i> | | | II | Terraneous herb | Well | 2004 |
| 55 | <i>Ormosia henryi</i> | VU | | II | Evergreen tree | Well | 2004 |

Table 7.8 Rare species of animals in the nominated property

| NO. | Species | IUCN Red List(2003) | CITES Appendix (1995) | China Red List(2004) | State-level Key Protected Grade(1989) | Condition existence | Recorded time |
|---------|-------------------------------|---------------------|-----------------------|----------------------|---------------------------------------|---------------------|---------------|
| Mammals | | | | | | | |
| M-1 | <i>Neofelis nebulosa</i> | VU | I | EN | I | Intact | 2004 |
| M-2 | <i>Panthera pardus</i> | EN | I | CR | I | Intact | 2004 |
| M-3 | <i>Muntiacus crinifrons</i> | VU | I | EN | I | Intact | 2004 |
| M-4 | <i>Macaca mulatta</i> | LR/nt | II | VU | II | Intact | 2004 |
| M-5 | <i>Macaca thibetana</i> | LR/cd | II | VU | II | Intact | 2004 |
| M-6 | <i>Manis pentadactyla</i> | LR | II | EN | II | Intact | 2004 |
| M-7 | <i>Cuon alpinus</i> | VU | II | EN | II | Intact | 2004 |
| M-8 | <i>Vulpes vulpes</i> | | III | NT | | Intact | 2004 |
| M-9 | <i>Selenarctos thibetanus</i> | VU | I | VU | II | Intact | 2004 |
| M-10 | <i>Lutra lutra</i> | | I | VU | II | Intact | 2004 |
| M-11 | <i>Viverra zibetha</i> | | III | EN | II | Intact | 2004 |
| M-12 | <i>Viverricula indica</i> | | III | VU | II | Intact | 2004 |
| M-13 | <i>Profelis temmincki</i> | VU | I | CR | II | Intact | 2004 |

Continued table 7.8 Rare species of animals in the nominated property

| NO. | Species | IUCN Red List(2003) | CITES Appendix (1995) | China Red List(2004) | State-level Key Protected Grade(1989) | Condition existence | Recorded time |
|---------|---------------------------------|---------------------|-----------------------|----------------------|---------------------------------------|---------------------|---------------|
| Mammals | | | | | | | |
| M-14 | <i>Felis bengalensis</i> | | II | VU | | Intact | 2004 |
| M-15 | <i>Hydrophotes inermis</i> | LR | | VU | II | Intact | 2004 |
| M-16 | <i>Capricornis sumatraensis</i> | VU | I | VU | II | Intact | 2004 |
| M-17 | <i>Elaphodus cephalophus</i> | DD | | VU | | Intact | 2004 |
| M-18 | <i>Muntiacus reevesi</i> | | | VU | | Intact | 2004 |
| M-19 | <i>Martes flavigula</i> | | III | NT | II | Intact | 2004 |
| M-20 | <i>Mustela kathiah</i> | | III | NT | | Intact | 2004 |
| M-21 | <i>Mustela sibirica</i> | | III | NT | | Intact | 2004 |
| M-22 | <i>Herpestes urva</i> | | III | NT | | Intact | 2004 |
| M-23 | <i>Melogale moschata</i> | | | NT | | Intact | 2004 |
| M-24 | <i>Meles meles</i> | | | NT | | Intact | 2004 |
| M-25 | <i>Arctonyx collaris</i> | | | VU | | Intact | 2004 |
| M-26 | <i>Paguma larvata</i> | | | NT | | Intact | 2004 |
| M-27 | <i>Myotis chinensis</i> | | | VU | | Intact | 2004 |
| M-28 | <i>Crocidura gmelini</i> | | | VU | | Intact | 2004 |
| M-29 | <i>Tadarida insignis</i> | | | VU | | Intact | 2004 |
| M-30 | <i>Micromys minutus</i> | LR | | LC | | Intact | 2004 |
| M-31 | <i>Hystrix brachyura</i> | VU | | VU | | Intact | 2004 |
| Bird | | | | | | | |
| B-1 | <i>Mergus squamatus</i> | EN | | VU | I | Intact | 2004 |
| B-2 | <i>Tragopan caboti</i> | VU | I | VU | I | Intact | 2004 |
| B-3 | <i>Syrnaticus ellioti</i> | VU | I | NT | I | Intact | 2004 |
| B-4 | <i>Aix galericulata</i> | | | NT | II | Intact | 2004 |
| B-5 | <i>Aviceda leuphotes</i> | | II | LC | II | Intact | 2004 |
| B-6 | <i>Milvus migrans</i> | | II | LC | II | Intact | 2004 |
| B-7 | <i>Accipiter gentilis</i> | | II | LC | II | Intact | 2004 |
| B-8 | <i>Accipiter soloensis</i> | | II | LC | II | Intact | 2004 |
| B-9 | <i>Accipiter trivirgatus</i> | | II | LC | II | Intact | 2004 |
| B-10 | <i>Accipiter nisus</i> | | II | LC | II | Intact | 2004 |
| B-11 | <i>Accipiter virgatus</i> | | II | LC | II | Intact | 2004 |
| B-12 | <i>Buteo buteo</i> | | II | LC | II | Intact | 2004 |

Continued table 7.8 Rare species of animals in the nominated property

| NO. | Species | IUCN Red List(2003) | CITES Appendix (1995) | China Red List(2004) | State-level Key Protected Grade(1989) | Condition existence | Recorded time |
|------|---------------------------------|---------------------|-----------------------|----------------------|---------------------------------------|---------------------|---------------|
| Bird | | | | | | | |
| B-13 | <i>Buteo lagopus</i> | | II | LC | II | Intact | 2004 |
| B-14 | <i>Spizaetus nipalensis</i> | | II | LC | II | Intact | 2004 |
| B-15 | <i>Aquila clanga</i> | VU | II | VU | II | Intact | 2004 |
| B-16 | <i>Circus cyaneus</i> | | II | LC | II | Intact | 2004 |
| B-17 | <i>Spilornis cheela</i> | | II | VU | II | Intact | 2004 |
| B-18 | <i>Pandion haliaetus</i> | | II | LC | II | Intact | 2004 |
| B-19 | <i>Microhierax melanoleucos</i> | | II | LC | II | Intact | 2004 |
| B-20 | <i>Falco subbuteo</i> | | II | LC | II | Intact | 2004 |
| B-21 | <i>Falco columbarius</i> | | II | LC | II | Intact | 2004 |
| B-22 | <i>Falco tinnunculus</i> | | II | LC | II | Intact | 2004 |
| B-23 | <i>Tyto capensis</i> | | II | LC | II | Intact | 2004 |
| B-24 | <i>Otus scops</i> | | II | LC | II | Intact | 2004 |
| B-25 | <i>Otus bakkamoena</i> | | II | LC | II | Intact | 2004 |
| B-26 | <i>Bubo bubo</i> | | II | | II | Intact | 2004 |
| B-27 | <i>Glaucidium brodiei</i> | | II | LC | II | Intact | 2004 |
| B-28 | <i>Glaucidium cuculoides</i> | | II | LC | II | Intact | 2004 |
| B-29 | <i>Ninox scutulata</i> | | II | LC | II | Intact | 2004 |
| B-30 | <i>Strix leptogrammica</i> | | II | LC | II | Intact | 2004 |
| B-31 | <i>Asio otus</i> | | II | LC | II | Intact | 2004 |
| B-32 | <i>Asio flammeus</i> | | II | LC | II | Intact | 2004 |
| B-33 | <i>Gallirallus striatus</i> | | | LC | | Intact | 2004 |
| B-34 | <i>Lophura nycthemera</i> | | | LC | II | Intact | 2004 |
| B-35 | <i>Pucrasia macrolopha</i> | | | NT | II | Intact | 2004 |
| B-36 | <i>Vanellus vanellus</i> | | | LC | | Intact | 2004 |
| B-37 | <i>Vanellus cinereus</i> | | | LC | | Intact | 2004 |
| B-38 | <i>Bombycilla garrulus</i> | | | LC | | Intact | 2004 |
| B-39 | <i>Rhinomyias brunneata</i> | VU | | VU | | Intact | 2006 |
| B-40 | <i>Leiothrix lutea</i> | | II | NT | | Intact | 2004 |
| B-41 | <i>Garrulax canorus</i> | | II | NT | | Intact | 2004 |
| B-42 | <i>Passer montanus</i> | | | NT | | Intact | 2004 |

Continued table 7.8 Rare species of animals in the nominated property

| NO. | Species | IUCN Red List(2003) | CITES Appendix (1995) | China Red List(2004) | State-level Key Protected Grade(1989) | Condition existence | Recorded time |
|----------|----------------------------------|---------------------|-----------------------|----------------------|---------------------------------------|---------------------|---------------|
| Reptilia | | | | | | | |
| R-1 | <i>Platysternon megacephalum</i> | EN | II | EN | | Intact | 2004 |
| R-2 | <i>Chinemys reevesii</i> | EN | | EN | | Intact | 2004 |
| R-3 | <i>Pelodiscus sinensis</i> | VU | | VU | | Intact | 2004 |
| R-4 | <i>Elaphe mandarina</i> | | | VU | | Intact | 2004 |
| R-5 | <i>Elaphe porphyracea</i> | | | VU | | Intact | 2004 |
| R-6 | <i>Elaphe taeniura</i> | | | VU | | Intact | 2004 |
| R-7 | <i>Zaocys dhumnades</i> | | | VU | | Intact | 2006 |
| R-8 | <i>Naja atra</i> | | II | VU | | Intact | 2006 |
| R-9 | <i>Bungarus fasciatus</i> | | | EN | | Intact | 2006 |
| R-10 | <i>Bungarus multicinctus</i> | | | VU | | Intact | 2006 |
| R-11 | <i>Gloydius brevicaudus</i> | | | VU | | Intact | 2004 |
| R-12 | <i>Dienagkistrodon acutus</i> | | | VU | | Intact | 2004 |
| R-13 | <i>Elaphe carinata</i> | | | VU | | Intact | 2004 |
| R-14 | <i>Ptyas korros</i> | | | VU | | Intact | 2004 |
| R-15 | <i>Ptyas mucosus</i> | | | VU | | Intact | 2004 |
| R-16 | <i>Enhydris chinensis</i> | | | NT | | Intact | 2004 |
| Amphibia | | | | | | | |
| A-1 | <i>Hoplobatrachus rugulosa</i> | | II | VU | II | Intact | 2004 |
| A-2 | <i>Rana spinosa</i> | | | VU | | Intact | 2004 |
| A-3 | <i>Rana nigromaculata</i> | | | NT | | Intact | 2004 |
| Insecta | | | | | | | |
| I-1 | <i>Teinopalpus aureus</i> | DD | | EN | I | Intact | 2004 |
| I-2 | <i>Carabus lafossei</i> | | | NT | II | Intact | 2004 |
| I-3 | <i>Carabus davidi</i> | | | NT | II | Intact | 2004 |
| I-4 | <i>Cheirotonus jansonii</i> | | | VU | | Intact | 2004 |

Table 7.9 Main scenic spots of the nominated property

| Location | Grade | Landscape type | |
|-------------------------|-------|--|--|
| | | Natural landscape | Humane landscape |
| Tiyunling Scenic Area | I | Oriental Goddess, Gigantic Boa Uprising, Guanying Enjoys Music | |
| | II | Leopard Cat Waiting for Mouse, Azalea Forest, Dragon Exploring Pine Trees, Old Taoist Worshipping the Moon, Three Dragons Rushing to Sea, Peak Guanying, Yuhuang Summit, Jade Platform, Dianjiang Platform, A Ray of the Sky, Three Rows of Peaks, Mt.Chongxiao, Wanhuchaotian, Peak Graceful, Gorge with a Ray of Light, Ravine with Flying Cloud, Peak Facing the Sky, Peak Yuyao, Valley Travelled by Celestial | |
| | III | Penguin Stone, Peak Heavenly Gate, Tainmen Peak, Gorge Travelled by Cloud, Peak Crown, Peak Dove, Bottle Gourd Stone, Peak Celestial Dog, Luhe Stone, Love Forever, Nanqing Heavenly Gate | Engraved on stone: "Mount Sanqingshan", "Gigantic Boa", "Taoism's Teaching Hidden in Nature", "Unsurpassed Elegance in Jiangnan", "Ten Li Azalea", "First Celestial Mountain Under Heaven", "Creator's Deep Love", "First Celestial Peak in Jiangnan", "Superlative Fortum Place", Nanqing Bridge, Dicui Pavillion |
| | IV | Fox Gnawing a Chicken, Treasure Mirror Stone, Baby Chicken Born from Egg, Nun Stone, Tiyunling Peaks, Peak Celestial Monkey, Peak Torch, Peak Camel | |
| | V | Treasure Stone, Pagoda Stone, Xianyun Stone, Stern Stone, Devil's Head Stone, Peak Fox, Hen Stone | |
| Yujing peak Scenic Area | I | Footprint at Celestial Platform, King-Monkey Admiring Treasure, Jindianmuyu, Peak Yuhua, Peak Yuxu, Peak Yujing, Flying Fairy Platform, Peak Heavenly Pillar, Cloud Sea, Sanqing Divine Light, Mt. Yusong, Horn Stone, Chessboard Stone, Calligraphy Engraved on Stone, Peak Nine Dragons, Peak Chaoyang, Be Happy Together Stone, Shengtian Stone, Peak Penglai, Peak Jiutianjinping, Qiongtai Platform, Hehe Stone | |
| | II | Dragon Stone, Crocodile Running to Sea, Snow Scene, Red Flower Tea Valley, Yaotai Platform, Jade Rabbit Stone, Peak Bamboo, Peak Lion, Peak Yingzhou | Platform for Shangshu to Meditate, Shengtian Stone, Denzheng Platform, Engraved Calligraphy, Divinity's Figure |
| | III | Judge Official Stone, Tiger's Head Stone, Cockscomb Stone, Jade Screen, Peak Fangzhang, Elephant Stone, Nanbei Pass, Haohan Slope | |
| | IV | Peak Tengang, Peak Purple Bamboo, Peak Cuiwei, Peak Wangmu, Pottery Figurine Stone, Danxia Well, Camel Stone, Water Play Pond, Shangshuwuxian Platform, Chinese Littleleaf Box Valley, Mt. Denji | Engraved Calligraphy "Tengang" |

Continued table 7.9 Main scenic spots of the nominated property

| Location | Grade | Landscape type | |
|-----------------------|-------|--|---|
| | | Natural landscape | Humane landscape |
| Celestial Bridge Pier | I | Eagle Spreading Wings, Ziyan Stone, Mist Scene, Peak Heavenly Gate, Cloud Sea, Sunrise, Dusk, Celestial Turtle Searching in Sea, Pea Wumen, Feiying Stone, Yumen Spring, Luquan Well, Peak Celestial Turtle, Cloths Wash Pond, Clear Pond, Hanxing Pond, Pine just like Canopy, Tanhai Pine, Mt. Nieyun, Shak Stone, Couple Pine, Peak Dragon's Head, Jujie Stone, Peak Chongxufeng, Lotus Leaf Pine, Guanxia Pine, Jixu Stone, Frog with Belly facing Sky, Pine Trees Shined by Moonlight | Sanqing Palace, Jiutianyinyuan Hall, Inspector's Hall, Training Hall, Dragon and Tiger Hall, Linguan Temple, Kuixin Hall, Heavenly Gate, Chongxubaibu Gate, Zhongmiaoqianbu Gate, Flying Fairy Platform, Wind and Thunder Pagoda, Leigong Pagoda, Gudan Well, Wanggu Tomb, Zanbiyun Tomb, Paiyun Bridge, Liuxia bridge, Heavenly Gate Archway |
| | II | Peak Elder, Peak Yanlong, Xiaoyao Road, Sister's Pine, Chenluan Ravine, Single Pillar Stone, Tanhai Pine, Hanging Bridge Stone, Mt. Guaguanling, Lianli Pine, Pagoda Pine, Drum Stone, Fangu Bridge, Chaoyang Cave, Tianzi Stone, Greeting Pine | Pill Making Furnace Relics, Fumuo shangxian, Fanghaoshang, Engraved Calligraphy on Stone |
| | III | Guaying Stone, Mother and Son Stone, Leigong Stone, Millet Stone, Big Garden, Small Garden, Jade Stamp Stone, Jingkui Stone, Stone Forest | Wind Gate, Heaven's Water Pond |
| | IV | Turtle Stone, Cloud Stone, Heavenly Treasure Stone, Parrot Stone, Mt. Baibuling, | |
| Bingyu Cave | I | Dapenxiaotian, Red Waterfall, Three Caves, Tangshen Traveling West, Qixi Shuangxin, Pier of Celestial | |
| | II | Bridge, Shuile Waterfall, Old Wolf with A Stone | |
| | III | Dati Stone, Rocket Stone, Scissors Stone, Lions Catching a Ball | Shicuan Pavillion |
| | IV | Gexianyan, Needle Sewing Sky, Panda Stone, Frog Stone Henwu | |
| Yuling Nunnery | I | Bingyu Cave, Four-Step Spring, Colourful Pond, Shimen Waterfall | |
| | II | Apricots and Plumes, Small Dragon Pond | |
| Yuling Nunnery | I | Yuling Moonlight, Yuling Stone Forest | |
| | II | Guanyin's Fingers | Guanxiang Pavillion of Yuling Nunnery, Tablet for Diaoqiao Qingdu Hanging Bridge, Fortum Place, Record Tablet for Yuling Nunnery |
| Xihua Platform | I | Xiangshui Pond, Qingfeng Stone, Qingyunqi Waterfall | Xihua Platform, Denhan Bridge |
| | II | Stone to Tie Up Tiger, Salamander Ravine, Jasper Stone, Mt. Qingyunling, Xiangba Notch | Buyun Ancient Way, Yangqing bridge |
| | III | Denhan Slope, Baishi Well | |
| | IV | Catfish Stone, Shaigu Stone, Eight Treasures Stone, Wangjia Stone, Qingfeng Road, Xianpo Notch | Engraved Calligraphy "Xiangpo Notch" |

7.d Address where Inventory, Records and Archives are Held

Table 7.10 Address where the most recent records (Inventory of property) are held

| Nomination | Organization | Address | Zip Code |
|-------------------------------|---|---|----------|
| Mt. Sanqingshan National Park | Management Committee of Mount Sanqingshan National Park | Waishuangxi, Sanqingshan Town, Shangrao City, Jiangxi Prov. | 334703 |
| | Department of Construction, Jiangxi Prov. | Shengfu Beier Road, Nanchang City, Jiangxi Prov. | 330046 |
| | Geologic Survey of Jiangxi Prov. | Xiangtang Development Zone, Nanchang City, Jiangxi Prov. | 330201 |
| | Earth and Space Science School, Beijing University | 38, Xueyuan Rd. Haiding Dis. Beijing City | 100871 |
| | Forestry Survey Planning Institute, Shangrao City, Jiangxi Prov. | 69, Shengli Rd. Shangrao City, Jiangxi Prov. | 334000 |
| | Wild Animal and Plant Conservation Administrative Bureau, Jiangxi Prov. | Shengfu Dongsan Rd. Nanchang City, Jiangxi Prov. | 330046 |
| | Town and Country Planning and Design Institute, Jiangxi Prov. | 610, Erqibei Rd. Nanchang City, Jiangxi Prov. | 330077 |

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9.SIGNATURE ON BEHALF OF THE STATE PARTY

WANG Guangtao
Minister of Construction
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ANNEX I

REGULATIONS ON NATIONAL PARKS



REGULATIONS ON NATIONAL PARKS

Decree of the State Council of the People's Republic of China
No. 474

The Regulations on National Parks, adopted at the 149 Session of the State Council Standing Committee, is hereby promulgated and shall come into force as of Dec., 1, 2006.

Premier Wen Jiabao

Chapter One General provisions

Article 1 The Regulations on National Parks (hereinafter referred to as Regulations) is hereby formulated for the purpose of enhancing the management of national parks for effective protection and reasonable exploitation of the resources of national parks.

Article 2 The Regulations are applicable to the set-up, planning, protection, exploitation and management of national parks.

National parks mentioned herein refers to zones where sightseeing, or scientific or cultural activities are conducted for the viewing, cultural or scientific value, concentrated natural and human landscapes, and beautiful environment.

Article 3 The State adopts for national parks the principle of scientific planning, uniform management, strict protection and sustainable exploitation.

Article 4 For the protection, exploitation's governments at the county level and above of the places where national parks lie are responsible.

Article 5 The competent agency of construction of the State Council takes charge of the supervision and administration of national parks in the whole country. Other related agencies of the State Council are responsible for relevant supervision and administration of national parks in light of the duties assigned to them by the State Council.

The construction governing sectors of the people's governments of provinces and autonomous regions and the national parks governing sectors of municipalities directly under the State Council are responsible for the supervision and administration of the national parks within their territories. Other related sectors of the people's governments of provinces, autonomous regions and municipalities directly under the State Council are responsible for relevant supervision and administration work in conformance with the duties assigned to them.

Article 6 Every unit or individual has the obligation to protect the resources of national parks and is authorized to stop and report the acts that damage such resources.

Chapter Two Establishment of national parks

Article 7 The establishment of national parks shall be conducive to the protection and reasonable exploitation of the resources of national parks.

The newly established national parks shall not superpose or intercross nature reserves; and should there be such superposition or intercrossing, harmony shall be achieved between the planning for national parks and that for nature reserves.

Article 8 National parks are in the national and provincial categories.

National parks at the national level can be established upon application for natural and human landscapes that can reflect the process of natural evolution and major historical, cultural development process, maintain the natural status or the original historical landscapes, and have national significance; and national parks at the provincial level can be established upon application for those with regional significance.

Article 9 Documents including the following information shall be submitted for the establishment of national parks:

- (1) The basic status of the resources of national parks under application;
- (2) The range of the national parks under application and of the core zones;
- (3) The nature and protection targets of the national parks under application;
- (4) The sightseeing conditions of the national parks under application;
- (5) The contents and results of negotiation with the holders of ownership and using right of natural resources, such as land and forests, and property like houses in the national parks under application.

Article 10 For the establishment of a national park at the national level, the people's government of a province, autonomous region or municipality directly under the State Council shall submit the application. The competent agency of construction of the State Council is to hold conferences for review with the governing environment protection agency, governing forestry agency and governing cultural relics agency of the State Council before submitting review opinions to the State Council for approval and publication.

For the establishment of a national park at the provincial level, the county people's government submits the application. The construction governing sector of the people's government of the province or autonomous region, or the national parks governing sector of the people's government of the municipality directly under the State Council is to hold conferences for review with other relevant sectors before submitting the review opinions to the people's government of the province, autonomous region or municipality directly under the State Council for approval and publication.

Article 11 The legitimate rights and interests of the holders of ownership or using right of the natural resources of national parks, such as land and forests, and property like houses are under legal protection. Before applying for the establishment of national parks, the people's government shall have full consultation with the holders of ownership and using right of natural resources, such as land and forests, and property like

houses in the national parks under application.

Compensation shall be given according to law should there be losses incurred to the holders of ownership and using right of natural resources of national parks, such as land and forests, and property like houses.

Chapter Three Planning

Article 12 The plannings for national parks have two categories, general planning and detailed planning.

Article 13 The formulation of general planning for national parks shall embody the demand for harmonious coexistence of human beings and the Nature, coordinated regional development and all-round social economic development, stick to the principle of giving priority to protection and submitting development to protection, and give prominence to the natural peculiarity, cultural indication and local features:

The general planning for national parks shall comprise the following contents,

- (1) evaluation of scenery resources;
- (2) protection measures for ecological resources, arrangement for major construction projects and the intensity of development and exploitation;
- (3) functional structure and space composition of national parks;
- (4) ranges that allow no development and that allow limited development;
- (5) number of allowed tourists;
- (6) relevant special plannings.

Article 14 The formulation of general planning for a national park shall be completed within two years since the date when the national park is established. The duration of a general plan is twenty years.

Article 15 The detailed planning for national parks shall be formulated in accordance with the different requirements for core zones and other zones so as to determine the location, arrangement and scale for construction projects of infrastructure, tourist facilities, cultural facilities, etc., and make clear the range of construction land and conditions for planning and design.

The detailed planning for national parks shall be formulated in conformance with the general planning.

Article 16 The plannings for national parks at the national level shall be formulated by the competent agency of construction of the provincial or autonomous region people's government or by the national parks governing agency of the government of municipality directly under the State Council.

The plannings for national parks at the provincial level shall be formulated by the county-level people's government.

Article 17 The formulation of plannings for national parks shall be undertaken by correspondingly competent organizations selected via such means of fair competition as public bidding.

The plannings for national parks shall conform to the approved range, nature and protection targets as required by relevant laws, regulations and technical standards.

Article 18 When formulating the plannings for national parks, efforts shall be made to widely refer to the

opinions of relevant sectors, the public and experts; and if necessary, hearings shall be held.

The materials of national parks plannings shall comprise the opinions of all walks of life as well as the information about the adoption of these opinions and the reasons for failure to adopt some or all of them if there is any.

Article 19 The general planning for national parks at the national level shall be submitted to the State Council for approval after being examined by the people's government of provinces, autonomous regions or municipalities directly under the State Council.

The detailed planning for national parks at the national level shall be submitted to the competent agency of construction of the State Council for approval by the competent agency of construction of the provincial or autonomous region people's government, or the national parks governing agency of the people's government of municipalities directly under the State Council.

Article 20 The general planning for national parks at the provincial level shall be submitted to the people's government of provinces, autonomous regions and municipalities directly under the State Council for approval and be filed at the competent agency of construction of the State Council.

The detailed planning for national parks at the provincial level shall be submitted for approval to the competent agency of construction of provincial or autonomous region people's government or to the national parks governing agency of the people's government of municipalities directly under the State Council.

Article 21 The plannings for national parks shall be published after being approved to the public, and every organization or individual is entitled to reading them.

Units and individuals in the national parks shall submit themselves to the approved plannings and relevant management.

No construction activities may be conducted in national parks before the plannings for national parks have been approved.

Article 22 No approved planning for national parks may be randomly modified. Should it be necessary to modify in the general planning the range, nature, protection targets, protection measures for ecological resources, arrangement of major construction projects, the intensity of development and exploitation as well as the functional structure, space composition and the number of allowed tourists, an application shall be submitted to the original approving organ for approval. The modification of other contents shall be filed in the original approving organ.

Where the detailed planning for national parks needs to be modified, an application shall be submitted to the original approving organ for approval.

Compensation shall be made according to law for the property losses that are incurred to citizens, legal persons or other organizations when the government or government agencies modify the plannings for national parks.

Article 23 Two years before the term of the general planning for national parks expires, the composing organ shall organize experts to appraise the planning for a decision on whether a new composition is necessary. The previous planning maintains in force till the new planning is approved.



Chapter Four Protection

Article 24 The landscapes and natural environment of national parks shall, in compliance with the principle of sustainable development, be put under strict protection from any damage or random modification.

The administrative agencies of national parks shall establish and perfect various management systems for the protection of resources.

The residents and tourists in national parks shall protect the scenery, waters, vegetation, wild animals and various facilities.

Article 25 The administrative agency of national parks shall investigate and identify the major landscapes and formulate corresponding protection measures.

Article 26 None of the following activities is allowed:

- (1) Activities that damage landscapes, vegetation, terrains and landforms, such as cut into mountains, quarry, mine, open up wasteland, build tombs and erect gravestones;
- (2) Build facilities for the storage of objects that are explosive, flammable, radioactive, poisonous and caustic;
- (3) Score or scrawl in the scenery or on facilities;
- (4) Litter around.

Article 27 The following activities that violate the plannings for national parks are forbidden: to establish various development zones in national parks and build hotels, rest houses, training centers, nursing homes as well as other constructions that have no bearing on the protection of national parks resources in core zones. Such buildings that have been in existence shall be moved out of the national parks according to the plannings.

Article 28 As for other construction activities that are not listed in Articles 26, 27, the application procedures shall be gone through under relevant laws and regulations upon the approval of the administrative agencies of national parks.

The location schemes for major construction projects like cable car and ropeway projects in national parks at the national level shall be submitted to the competent agency of construction of the State Council for approval.

Article 29 The following activities in national parks shall be approved beforehand by relevant governing sectors under relevant laws and regulations after the examination of the national parks administrative agencies:

- (1) set up and post business advertisements;
- (2) host large-scale entertainment activities;
- (3) conduct activities that alter the natural status of water resources and water environment;
- (4) hold other activities that may influence the ecological environment and landscapes.

Article 30 The construction projects in national parks shall comply with the plannings for national parks and be kept in harmony with the landscapes. No damage to the landscapes, pollution of environment and obstruction to sightseeing is allowed.

When construction activities are conducted in national parks, the construction owners and construction units shall prepare schemes for preventing pollution and preserving soil, and preserve the surrounding scenes, waters, vegetation, wild animal resources, terrains and landforms with effective measures.

Article 31 Article 30 The State is to establish a management information system for national parks to maintain a mobile monitoring of the implementation of plannings for national parks and resources protection. The administrative agencies of national parks at the national level shall submit to the competent agency of construction of the State Council reports on the planning implementation and protection of natural resources like land and forests. The competent agency of construction of the State Council shall copy and send in time such reports to relevant agencies of the State Council.

Chapter Five Exploitation and management

Article 32 The administrative agencies of national parks shall protect traditional ethnic, folk culture, organize healthy, meaningful sightseeing, cultural entertainment activities, and spread historical, cultural and scientific knowledge in light of the characteristics of the national parks under its management.

Article 33 The administrative agencies of national parks shall reasonably exploit resources, and improve traffic, service facilities and sightseeing conditions.

The administrative agencies of national parks shall set sign boards, road marks, safety reminders, etc. in the national parks.

Article 34 The management of religious activities sites in national parks shall follow the relevant State provisions on the management of religious activities sites.

Relevant State laws and regulations shall be applied to the protection, exploitation and management of natural resources, protection of cultural relics and the management of nature reserves in national parks.

Article 35 The competent agency of construction of the State Council shall monitor, check and appraise the plannings implementation and resources protection of national parks. The problems that have been found out shall be rectified and solved in time.

Article 36 The administrative agencies of national parks shall establish and perfect safety guarantee systems to enhance safety management and guarantee safety in sightseeing, and submit business units in the national parks to the supervision and checks of relevant sectors under laws and regulations.

Reception of tourists exceeding the stipulated maximum number and organizing sightseeing activities in zones lacking safety guarantee are forbidden.

Article 37 The admission tickets for national parks are sold by the administrative agencies. The prices shall be prescribed under relevant laws and regulations on prices.

Operators of traffic and services shall be selected by the administrative agencies via such means of fair competition as public bidding under relevant laws and regulations as well as the plannings for national parks.

The administrative agencies of national parks shall sign contracts with business operators to clarify the rights and obligations of each other. Business operators shall pay for the exploitation of the resources of national parks.

Article 38 The income from admission tickets and fees collected for the exploitation of resources shall be managed in a system different from that of expenses.

The income from admission tickets and fees collected for the exploitation of resources shall be utilized for the protection and management of resources as well as the compensation for the holders of ownership and using right of property in the national parks. The specific management methods are to be stipulated by the financial agency and price administration of the State Council, with the participation of the competent agency of construction of the State Council.

Article 39 The administrative agencies of national parks are not allowed to do profit-oriented business, and to entrust the administrative functions such as planning, management and supervision to enterprises or individuals.

No employee of the administrative agencies of national parks is allowed to take part-time jobs in the enterprises in national parks.

Chapter Six Legal liabilities

Article 40 For the following acts that violate the Regulations, the administrative agencies of national parks will order the actors to terminate the offence, restore the places to the original status, or clear up, confiscate illegal income and impose a fine of RMB 500,000-1,000,000:

- (1) conduct such activities as cut into mountains, quarry and mine that damage landscapes, vegetation, terrains and landforms in national parks;
- (2) build facilities for the storage of objects that are explosive, flammable, radioactive, poisonous and caustic in national parks;
- (3) build hotels, rest houses, training centers, nursing homes as well as constructions that have no bearing on the protection of the resources of national parks.

As for local people's governments at the county level and above and their superior agencies that approve the activities in paragraph (1), the person directly in charge and other responsible persons shall be punished by degrading or dismissal from post, or subject to criminal liabilities should there be criminal offenses.

Article 41 As for constructions that are not forbidden in national parks but violate the Regulations, the administrative agencies are to order the actors to terminate and clear up the construction in a specified time, and impose a fine of RMB 20,000-50,000 on individuals or RMB 200,000-500,000 on units should no approval have been obtained from the administrative agencies.

Article 42 For the location scheme of a construction project such as cable car and ropeway projects built in violation of the Regulations in national parks at the national level, should the relevant sector of the local people's government at the county level or above issue approval opinions on the location, administrative punishment shall be imposed on the person directly in charge and other relevant responsible persons if the

location scheme is not approved by the competent agency of construction of the State Council. Where criminal offences occur herein, criminal liabilities shall be imposed.

Article 43 As for individuals that, in violation of the Regulations, damage landscapes, vegetation, terrains and landforms by opening up wasteland, building tombs and erecting gravestones, etc., the administrative agencies of national parks are to order the actors to stop the offences, restore the places to the original status or take up other remedy measures, confiscate illegal income, and impose a fine of RMB 1,000-10,000.

Article 44 For the acts of scoring or bedaubing scenes or facilities, or littering around in national parks that violate the Regulations, the administrative agencies of national parks may order the actors to restore the places to the original status or adopt other remedy measures, coupled with a fine of RMB 50; for the acts of intentionally damaging cultural relics, key points of interest and historic sites by scoring, bedaubing or other means, punishment shall be imposed according to the Law on Punishment in Public Security Management. Criminal punishment shall be imposed should there be criminal offences.

Article 45 For the following activities conducted in national parks in which the organizers fail to abide by the Regulations and to apply to the administrative agencies of national parks, the administrative agencies may order the organizers to stop the offences, restore the places to the original status in a specified time or take up other remedy measures, confiscate the illegal income, and impose a fine of RMB 50,000-100,000; and the fine may be RMB 100,000-200,000 should there be serious circumstances:

- (1) set up or post business advertisements;
- (2) organize large-scale entertainment activities;
- (3) hold activities that alter the natural status of water resources or water environment
- (4) conduct other activities that affect the ecological environment and landscapes.

Article 46 Where construction units, in violation of the Regulations, damage the surrounding scenes, waters, vegetation, resources of wild animals, terrains and landforms, the administrative agencies of national parks may order the construction units to stop the offences, restore the places to the original status, or take up other remedy measures, coupled with a fine of RMB 20,000-100,000. For those that fail to restore the places to the original status or take up other remedy measures, the administrative agencies may order the construction units to suspend their construction.

Article 47 When the competent agency of construction of the State Council, local people's government at the county level and above or its superior sector has the following activities violating the Regulations, punishment shall be imposed on the person directly in charge and other responsible person, and criminal penalty shall be imposed should there be criminal offences:

- (1) set up various development zones in national parks in violation of the plannings;
- (2) fail to complete the formulation of general planning for national parks in two years since the setting-up of the national parks;
- (3) fail to select a correspondingly competent unit for the formulation of plannings for national parks;
- (4) approve construction activities in national parks before the plannings for the national parks are approved;
- (5) randomly modify the plannings for national parks;

(6) other acts that fail to carry out the supervisory, management duties according to law.

Article 48 Where the administrative agencies of national parks have the following acts violating the Regulations, the local people's government at the county level that have set up the administrative agencies may issue an order for rectification, and punish the person directly in charge and other responsible persons by degrading or dismissal from post if there are serious circumstances. Criminal punishment shall be imposed should there be criminal offences:

- (1) receive tourists exceeding the specified maximum number or conduct sightseeing activities in zones without safety guarantee;
- (2) fail to set up sign boards, road marks or safety reminders;
- (3) organize profit-oriented business activities;
- (4) entrust the administrative functions of planning, management and supervision to enterprises or individuals;
- (5) allow their employees to take part-time jobs in the enterprises in the national parks;
- (6) consent upon examination to construction activities that violate the plannings for national parks;
- (7) fail to investigate and punish regulatory offences after they are found out.

Article 49 As for the offences in Article 40.1, 41, 43, 44, 45, 46, further punishment will not be imposed by the administrative agencies of national parks when relevant sectors have punished the offenders according to relevant laws and regulations.

Article 50 For the offences in Article 40.1, 41, 43, 44, 45, 46, relevant units or individuals shall be subject to civil liabilities where the property of the State, public units or individuals is damaged.

Article 51 When an order issued under the Regulations for clearing up constructions, works or other facilities in a specified time, the units or individuals involved shall immediately stop the construction acts and clear them up by themselves. As for those that continue the construction work, the organ that has made the decision on the clearing-up has the authority to stop them. When there is an objection to the decision, a lawsuit may be filed in the people's court within fifteen days upon receiving the decision. When the units or individuals involved do not turn to the court while failing to clear up by themselves, the decision-making organs may apply to the people's court for an coercive enforcement with the offenders bearing the cost.

Chapter Seven Accessory articles

Article 52 The Regulations is to come into force as of Dec., 1, 2006. The Provisional Regulations on the Management of National Parks is abolished on the same day.

Sept., 19, 2006



CHINA
SANQINGSHAN

ANNEX II

REGULATIONS OF JIANGXI PROVINCE ON THE MANAGEMENT
OF MOUNT SANQINGSHAN NATIONAL PARK

REGULATIONS OF JIANGXI PROVINCE ON THE MANAGEMENT OF MOUNT SANQINGSHAN NATIONAL PARK

Announcement of the Standing Committee of the Tenth People's Congress of Jiangxi Province

No.74

The Regulations of Jiangxi Province on the Management of Mount Sanqingshan National Park, adopted at the 22nd Session of the Standing Committee of the Tenth People's Congress of Jiangxi Province on July 28, 2006, is hereby promulgated and shall take effect as of August 1, 2006.

Standing Committee of the People's Congress of Jiangxi Province

July 28, 2006

Chapter One General provisions

Article 1 In order to strengthen the protection and management of Mount Sanqingshan National Park (hereinafter referred to as Sanqing Park), and to reasonably exploit the resources, the Regulations of Jiangxi Province on the Management of Mount Sanqingshan National Park (hereinafter referred to as Regulations) is formulated in accordance with relevant laws and regulations, and in light of the actual situation of Mount Sanqingshan National Park.

Article 2 The boundary of Sanqing Park is in accordance with the coordinates defined in the General Planning for Sanqing Park (hereafter referred to as General Planning) approved by the State Council. Scenic areas and spots include Tiyun Mountain, Yujing Peak, Sanqing Palace, Xihua Terrace, Yuling Temple, Bingyu Cave, Xianqiaodun, Balong Pool, Yulian Waterfall and Fuliangkeng Reservoir, etc.

Article 3 The protection, exploitation and management of Sanqing Park shall be guided by the principle of scientific planning, uniform management, strict protection and sustainable exploitation.

Article 4 As an expedited sector of Shangrao Municipal People's Government, Mount Sanqingshan National Park Management Committee (hereafter referred to as Mount Sanqingshan Management Committee) is liable to the protection, exploitation and uniform management of Sanqing Park under the Regulations. All departments inside the Sanqing Park, except being under the leadership of their superior organs in terms of their respective business, are subject to the uniform planning and management of Mount Sanqingshan Administrative Committee.

Article 5 The duties of Mount Sanqingshan Management Committee are:

(I) To publicize and implement the relevant laws and regulations on the protection and management of

national parks;

(II) To implement the General Planning for Sanqing Park and the Detailed Planning for Sanqing Park (hereafter referred to as Detailed Planning); to protect and reasonably utilize the resources of the National Park;

(III) To formulate and implement the Detailed protection and management rules of the National Park;

(IV) To implement the investigation, evaluation and registration works of resources of the National Park;

(V) To coordinate the works among relevant departments within the protective range of the National Park;

(VI) To manage the infrastructure and public establishments within the protective range of the National Park; to improve the service conditions;

(VII) To manage other business related to protection of the National Park.

Article 6 Competent Administrative Department for Construction of Jiangxi Provincial People's Government is in charge of the supervision and management of Sanqing Park. Other administrative departments are responsible for the supervision and management work based on the respective responsibilities assigned.

Chapter II Planning.

Article 7 The General Planning approved by the State Council and the Detailed Planning formulated hereunder are the guidance for the protection, exploitation and management of Sanqing Park, and must be strictly enforced.

Article 8 The Detailed Planning is compiled by Shangrao Municipal Government in accordance with the General Planning, and is to be submitted to the competent agency of construction of the State Council for approval after the examination by the competent agency of construction of the People's Government of Jiangxi Province.

Article 9 The Detailed Planning shall be formulated conforming to the different requirements of the National Park and scenic spots as well as pertinent State technical standards to define the site selection, layout and scale of infrastructure, tourist facilities and cultural establishments, and to make clear the boundary of construction land and conditions of planning and design.

The compilation of the Detailed Planning shall be undertaken by institutes with Class B and above compilation qualifications.

Article 10 When drafting the Detailed Planning, opinions from relevant departments, experts and the public shall be solicited. Major objections from these sides are subject to examination by Shangrao Municipal People's Government via argumentation and hearings.

The documentation on the Detailed Planning submitted for examination and approval shall cover the opinions from all walks of life and the information about the adoption of these opinions and the reasons for failure to adopt some or all of them if there is any.

Article 11 Shangrao Municipal People's Government shall publicize the major contents of the approved General Planning and Detailed Planning via government websites or other forms. All departments or individuals are authorized to access the information.

Article 12 No unauthorized changes should be made to the approved General Planning or Detailed Planning. Changes deemed necessary shall follow the former examination and approval procedures.

Chapter III Protection

Article 13 The landscape and natural environment of Sanqing Park shall be put under strict protection from damage or random changes.

Mount Sanqingshan Management Committee shall bear the protection responsibility of landscape and natural environment inside the National Park in accordance with the laws and regulations concerning protection of famous scenic resources.

The units, villagers (residents) and tourists inside Sanqing Park are not allowed to damage the scenic objects, waters, forests, vegetation, wild animals and facilities inside the Parks.

Article 14 Mount Sanqingshan Management Committee shall investigate, appraise and put in file the natural and human landscapes of the National Park. Relevant protection measures shall be formulated for special geologic relics, human landscapes and other major government-protected objects.

Article 15 Mount Sanqingshan Management Committee shall do well in the protection of forest resources inside the National Park, including prevention and control of geologic hazard, afforestation, forest fires prevention and control of pests.

Mount Sanqingshan Management Committee is authorized to temporarily shut the entrance of major scenic areas or spots, and give public notices, in the light of protection of forest reserves, ecological restoration and forest fires prevention.

Article 16 Sanqing Park, according to the respective landscape value and protection demand, is divided into Top Class, Class I, Class II and Class III protection zones. Every protection zone is demarcated through erecting piles by Mount Sanqingshan Management Committee under the General Planning.

Article 17 The following acts are prohibited inside Class III Protection Zones:

- (I) Setting up of development zones;
- (II) Construction of establishments storing inflammable, explosive, radioactive, poisonous and corrosive articles;
- (III) Performance of quarrying rock, building graves, erecting gravestones, quarrying sand and such activities demolishing landscapes, vegetation and landforms;
- (IV) Clear cutting trees, burning grass for reclamation or hunting wild animals;
- (V) Scoring or smearing the scenic objects or establishments;
- (VI) Littering or dumping of waste;
- (VII) Releasing untreated sewage to waters;
- (VIII) Picnic or other activities against fire regulations at non-appointed places.

Article 18 The following acts are prohibited inside Class II Protection Zones:

- (I) Acts listed in Article 17;

- (II) Constructing hotels, guest houses, training centers, sanatorium and entertainment areas;
- (III) Constructing engineering works irrelevant to sightseeing;
- (IV) Smoking, burning incense or candle, or burning fireworks and crackers at non-appointed places.

Article 19 The following acts are prohibited inside Class I Protection Zones:

- (I) Acts listed in Article 18;
- (II) Constructing facilities irrelevant to travel by walks;
- (III) Arranging accommodation beds;
- (IV) Cultivating or felling trees;
- (V) Entering by powered vehicles.

The operators of present hotels inside Class I Protection Zones shall gradually reduce the number of beds, and move out all the beds in existence within 3 years since the Regulations comes into force.

Article 20 The following acts are prohibited inside Top Class Protection Zones:

- (I) Acts listed in Article 19;
- (II) Constructing any facilities;
- (III) Entering by tourists.

Article 21 For the following acts inside Sanqing Park, approval shall be obtained from Mount Sanqingshan Management Committee, and the application for further approval shall be submitted to competent administrative departments in accordance with relevant laws and regulations:

- (I) Setting up and posting advertisements;
- (II) Holding large-scale entertainment activities;
- (III) Shooting movie or TV programs;
- (IV) Other activities affecting the ecology and landscape.

Article 22 Any new construction, rebuilding or expansion activity in Sanqing Park must undergo examination and approval procedures in accordance with relevant laws, regulations and capital construction procedures. The competent construction agencies of the People's Government of Jiangxi Province is responsible for the preliminary review of application documentation for site selection of major projects inside Sanqing Park, such as construction of cable car and ropeway projects, and airs its opinions on it. The comments of preliminary review and all application materials shall be submitted to the competent construction agency of the State Council for examination and approval. Site selections of other construction projects are subject to the examination and approval of the competent administrative agency for construction of the People's Government of Jiangxi Province.

For construction projects that might adversely affect the growth and habitation of national and local rare wildlife, the company in charge of construction shall make relevant evaluation on the environmental impact statement for submittal. The competent administrative agency for environmental protection shall seek the opinions of Jiangxi Provincial administrative department for wildlife during examination of the statement.

Article 23 The layout, height, mass, shape and color of construction projects shall retain the characteristics of Sanqing Park and keep in resonance with the surrounding environment. The existing befouling environ-

ment or establishments being a hindrance to the landscape inside the Park shall be demolished or moved out under the supervision of Mount Sanqingshan Management Committee.

Article 24 The authorized units or individuals undertaking construction inside Sanqing Park are liable to take effective measures to protect the mountains, waters, forests, vegetation, historical sites and geologic relics surrounding the construction site, and shall timely clean the field and restore the environment after the completion of construction.

Article 25 The houses of villagers (residents) inside Sanqing Park shall be built under a uniform planning. The construction scale and land area shall be legally confirmed by Shangrao Municipal competent administrative agency for land resources and Mount Sanqingshan Management Committee.

Chapter IV Exploitation and administration

Article 26 Mount Sanqingshan Management Committee shall, in conformity with the General Planning and Detailed Planning for Sanqing Park, make rational use of the resources of the Park, carry out positive sightseeing and entertainment activities, and spread historical, cultural and scientific knowledge.

Article 27 Mount Sanqingshan Management Committee shall gradually improve the transportation, services and sight-seeing conditions inside the Park, rationally ratify the tourist capacity and touring routes, set standard place and road name signs, distribute tourists in high seasons, and enhance the management of tourist guides and sedan-chair workers.

Article 28 Mount Sanqingshan Management Committee shall establish and improve the safety guarantee systems, strengthen the safety education and management of its employees and tourists, submit the business operators of the National Park to the surveillance by departments concerned in accordance with laws, regulations and rules.

At dangerous places of the National Park, Mount Sanqingshan Management Committee ought to place safety devices and caution signs. The tourist flow admitted shall not exceed the rated. Areas without safety guarantee are not allowed to visit.

Article 29 Mount Sanqingshan Management Committee shall strengthen the management of public security and fire prevention, timely stop and dispose of behaviors damaging the resources of the National Park and endangering the personal and property safety of tourists, and maintain a sound social order.

Article 30 Mount Sanqingshan Management Committee shall strengthen the supervision and management of environmental sanitation and food hygiene in the National Park. Necessary sanitary installations shall be set up. Units or individuals dealing with business operations in the National Park shall observe the relevant regulations of environmental sanitation and food hygiene management.

Mount Sanqingshan Management Committee shall supervise the relevant departments in charge of the innocuous treatment of sewage inside the national parks and removal of building and domestic garbage.

Article 31 Commercial vehicles entering Sanqing Park shall run on the tracks appointed by Mount

Sanqingshan Management Committee and park at the designated places. Non-commercial vehicles shall run on the tracks and park as per the prescriptions by Mount Sanqingshan Management Committee.

Article 32 The administration and protection of cultural relics at religious places inside Sanqing Park shall be implemented in accordance with relevant laws, regulations and rules.

Article 33 The admission tickets of Sanqing Park shall conform to the standards ratified by the competent administrative agency for prices of the People's Government of Jiangxi Province.

The operators of transportation, services and such business items inside the Park shall be determined by Mount Sanqingshan Management Committee pursuant to relevant laws, regulations and the general planning for Sanqing Park by such means of fair competition as public bidding.

Units or individuals engaged in business operations related to the resources of Sanqing Park shall pay for the exploitation of the resources. The specific measures for the collection, management and use of such payment are to be otherwise formulated by the People's Government of Jiangxi Province.

Article 34 The Competent Administrative Department for Construction of Jiangxi Provincial People's Government shall undergo supervision and examination of the Detailed execution of planning and resource conservation of Sanqing Park. Problems detected during examination are to be corrected by responsible departments under its supervision.

Chapter V Legal liabilities

Article 35 If the competent administrative agency for construction of the People's Government Jiangxi Province, Shangrao Municipal People's Government or relevant departments, in violation of the Regulations, commits any of the following acts, the person directly in charge or other responsible persons shall be subject to administrative sanctions according to their managerial powers:

- (I) Approval of setting development zones inside Sanqing Park;
- (II) Approval of constructions non-conforming to the plannings for Sanqing Park;
- (III) Random changes of the plannings for Sanqing Park;
- (IV) Other acts of failing to perform the supervising and managing functions.

Article 36 Mount Sanqingshan Management Committee, upon commission of any of the following acts in violation of the Regulations, is ordered to remedy the situation by Shangrao Municipal People's Government; if the committee refuses to remedy or serious consequences are caused, the person directly in charge or other responsible persons will be degraded or be dismissed from the post:

- (I) Approval of construction activities inside Sanqing Park not conforming to the plannings;
- (II) Reception of tourists exceeding the rated flow, or conducting activities in the areas without safety guarantee;
- (III) Nonperformance of setting or timely repair of road signs or safety caution placards;
- (IV) No investigation or punishment measures for offences;
- (V) Breaching of duty, misusing of authority and self-seeking misconduct.

Article 37 A party committing any of the following acts inside Sanqing Park is ordered to stop the illegal

act, dismantle within the prescribed time limit and restore the original state under the supervision of Mount Sanqingshan Management Committee, or be subject to a fine of RMB 30 per square meter. If the responsible party fails to dismantle or restore the state within the time limit, or serious consequences have been resulted in, it is subject to a fine between RMB100 and 200 per square meter. Mandatory dismantling will be implemented. The responsible party shall also assume the corresponding compensation liabilities for any loss:

- (I) Construction of establishments storing inflammable, explosive, radioactive, poisonous and corrosive articles;
- (II) Construction of hotels, rest houses, training centers, nursing homes and entertainment areas in Class II Protection Zones, or of engineering works irrelevant of tourism;
- (III) Construction of establishment irrelevant of safety protection of walks in Class I Protection Zones;
- (IV) Construction of facilities in the top protection zone.

Article 38 Mount Sanqingshan Management Committee shall order such a party committing any of the following acts inside Sanqing Park to stop the offence and make rectifications, and impose a fine between RMB 50 and 100. It may further impose a fine of RMB 100-500 if the party fails to make rectifications. In case of losses caused, the responsible party is subject to damages under law:

- (I) Scoring or smearing the scenic objects, trees or establishments inside the Park;
- (II) Randomly littering or dumping of waste;
- (III) Entering the top protection zone by tourists.

Article 39 Mount Sanqingshan Management Committee shall order to stop any acts of building graves or erecting gravestones inside Sanqing Park, and restore the original state of the environment within a specified time limit. The responsible party will also be subject to a fine of RMB 2,000-10,000 in light of the seriousness of the case.

Article 40 Mount Sanqingshan Management Committee shall order to stop any acts of arranging accommodation beds or farming inside the Class I Protection Zones of Sanqing Park, and confiscate illegal gains. It will further impose a fine of RMB5,000-20,000 if the responsible party fails to make rectifications. In case of losses caused, the responsible party is subject to damages.

Article 41 As for other acts in violation of the Regulations which are subject to punishment by other administrative agencies in accordance with laws and regulations, the punishment is imposed accordingly.

Chapter VI Accessory articles

Article 42 The Regulations is to come into force as of August 1, 2006.

Conservation and Management Plan of Mount Sanqingshan National Park

Compiler :

Management Committee of Mount Sanqingshan National Park

Institute for Urban and Rural Planning & Designing of Jiangxi Province

2005.12

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1. Outline of Mount Sanqingshan National Park

Mt Sanqingshan National Park occupying an area of 22,950 ha. started to be surveyed for scenery resources in 1982. It was designated as one of the first batch provincial rate scenic areas in 1985 and approved to be one of the second batch China national parks by the State Council in 1988. In 2005 Sanqingshan was approved to be a national geopark by Ministry of Land and Resources. Now as a natural property designated by Chinese Government, is applying to World Heritage Committee for inscription on World Heritage List.

1.1 Coordinates and Location

The nominated property is located at N 28° 48' 22 " –29° 00' 45 " and E 117° 58' 20 " –118° 08' 28 " , within the scope of Shangrao City, 87km from the downtown of Shangrao. Linked by a railway and high grade highways with Shangrao, Jingdezhen, Hangzhou and Shanghai, and other major towns(see Fig.2 of Annex).

1.2 Physiographic Features

1.2.1 Topography, Geology and Geomorphology

Mount Sanqingshan is located in the west of the Huaiyu mountain range. It has rugged mountain relief formed as a result of rapid uplift of a faulted granite block, a wet climate and deep dissection by flowing water of highly jointed granitic bedrock. The relief of the mountain is steep on the east, south and west sides, but on the north it is gentle. Slopes generally rises over a horizontal distance of approximately 5 km from a height of 200m in the foothills to 1,816.9m at Peak Yujing.

The nominated property is a mountainous area, composed largely of early Cretaceous A-type granite. In the property and within the surrounding area, are an M type “oceanic” plagiogranite dating from more than 900Ma., a relict from the Proterozoic South China Ocean, and a granite series formed during the Mesozoic intra-continental deep subduction. The latter was a product in response to subduction of the Paleopacific Plate, and gave rise to I, S and A types of granite, representing two tectonic-magmatic zones.

Mount Sanqingshan is a tectonically uplifted rigid block of hard Yanshanian ultra-acidic, highly silicic granite. It is the massive nature of this rock mass, together with its fracture system, that provides the principal controls on the geomorphology and landscape of the mountain. At the surface the exposed faults and joints that cut the mountain have been exploited by runoff and percolating water. Over time, weathering, collapse and fluvial erosion along the lines and faces of exposed fractures have shaped Sanqingshan’s landforms, from the major valleys and deep gorges, to the peak forests and pictographic stones.

1.2.2 Climate

Climate and altitude are fundamental influences on the geomorphology and ecology of Mount Sanqingshan. Located 340 km west of the East China Sea, the mountain environment is affected by maritime weather and belongs to the middle sub-tropical monsoon climate type. However, because of its height, Mt Sanqingshan also experiences altitudinal climatic variation. The year has four distinctive seasons: a cold and rainy spring, a hot and rainy summer, a dry autumn, and a cold and humid winter, when the mountain-tops may be covered with snow. While the annual average temperature is 10.9°C, the average for July is 21.1°C, and the maximum temperature in July and August is 33°C. The minimum temperature in January is -16.0°C. Annual average rainfall is 1,857.7 mm, while annual evaporation is 1,331.6 mm. Annual average relative humidity is 82%.

1.2.3 Soil, Vegetation and Biodiversity

Parent rock mass of Sanqingshan's soil are mainly weathered acidic crystalline rocks, such as porphyroid granite, granite and granodiorite. The weathered rocks are loose in character, containing plenty of quartz grains and some fragments of feldspar and mica, poorly fertilized and easy to erode out. For the long standing cloud and less sunshine, and the thick layer of dry and decayed leaves, the soil at altitude 800m-1,200m is yellow, or called mountainous yellow soil. On the summit area above 1,600m, such as Yujing Peak, within its plain and depressions there is mountainous meadow soil that is gray-yellow, containing plenty of semi-weathered fragments, fertilized, strongly acidic. In character it belongs to a light textured soil, it is the distinctive soil of Mount Sanqingshan.

Mount Sanqingshan is located in the eastern area of China, belonging to the Sino-Japanese flora domain of the East Asia flora zone. The Vegetation type of Mount Sanqingshan is diverse and shows a typical mountain vegetation character, belonging to the type of middle mountain humid evergreen broad leaved forest in the east of China mid-subtropic zone. There are 2,373 species (including subspecies) of higher plants, which belong to 984 genera of 253 families. Among these species, there are 368 species of Bryophyta from 165 genera of 65 families; 179 species of Pteridophyta from 71 genera of 34 families; 24 species of Gymnospermae from 22 genera of 6 families, and 1,802 species of Angiospermae from 726 genera of 148 families. Accordingly, this region not only harbours some of the most abundant plant species growing in the middle subtropical evergreen broad leaved forest in China, but it is also the world distribution centre for *Pseudotsuga* genus of the Pinaceae family, in particular, *Pseudotsuga gaussenii*.

More than 300 endemic species, belonging to 19 genera endemic to China, are found in Mount Sanqingshan. There are 67 species of Beasts, 226 species of Birds, 49 species of Reptiles and 36 species of Fish recorded in Sanqingshan.

1.2.4 Hydrology and Water Resource

Mt Sanqingshan is situated at the middle reach of Yangtze River basin, and it serves as headwater of

Xinjiang, one of tributaries of Poyang Lake. Surface brook drainage system of Sanqingshan joins into several streams in the southeast side which flow into Xinjiang. In the northwestern side the surface water flows into Poyang Lake through Le'an River. The only water source is rainfall that reaches over 1,900mm annually. Precipitated water is drained through well-developed structural fractures into a valley. Precipitation clearly fluctuates with season, abundant in rainy season while poor in dry season. Ground water is contained in fractures of bedrock. In dry period daily discharge of ground water is only 14,576 m³ which means annual discharge 1,793,229 m³; while in average time 5,071,446 m³, and in water abundant period 5,936,360 m³. The data usually change depending on altitude. There are famous springs in Sanqingshan such as Luquan, Yumenquan, Danjing, Xuanquan and Yingyuanquan etc, waterfalls such as Yulian, Yangqing, Qingyun, Bingyudong, Shiguling, Shuileken and Bajilongtan etc, and ponds such as Jingyi, Hanxing and Qinghua. Surface water flow changes clearly with season. It is estimated that in dry period the runoff is only 1 L/s each km². However, it reaches 3~6 L/s each km² in area of limestone and calcareous shale of Yangliugan Formation, the middle Cambrian System.

1.3 Culture and Geography

1.3.1 Nationality and Population

The human activity in the area of Mt Sanqingshan National Park was long-standing and may date back to the East Jin Dynasty, when the famous Taoist Ge Hong came here to make pills of immortality and left Gudan well and an incense burner. There has been Taoist activity till 500 years ago on the mountain. As Taoism had declined, the natural primeval state was restored. For the precipitous and rigid relief, the distal location at boundary between Jiangxi and Zhejiang Provinces, Mount Sanqingshan has not been easily accessible. In last 300 years a few people have moved in this area, but the population density is very low and most population inhabit around the mountain, mainly of Han Nationality, and some are of the National minority that live near Fenshui River in the north. In the core scenic area of the nominated property there is no population except visitors and rangers of the park. In 2004 the population of the nominated property totaled 5,790, while population density was 25.24 people per km².

1.3.2 State of Land Use and Economic Activity

Mt Sanqingshan National Park embraces farmland 2.94%, forest 88.6%, water body 0.69% and land for construction 7.77%.

The economy of the nominated property mainly includes tourism, cultivation, rearing and other sidelines. Local villagers are very poor, and have annual average pure income only 1,387 Yuan or 173 USD per person. They desire to develop tourism, then further to promote the local economy.

1.4 History of the National Park

Since the establishment of the People's Republic of China, the state has attached great importance to the

protection of the nominated property. In 1984 the Shangrao Regional Party Committee and Shangrao Administrative Office set up a special team to manage Shangrao Region Scenic Spots and a county level Administration for Mount Sanqingshan Scenic Area. In 1988, Mount Sanqingshan was designated a National Park of China, placing the natural resources under the highest level of protection and management. In 1996 the former Shangrao Regional Party Committee and Shangrao Administrative Office approved the establishment of the Management Committee of Mount Sanqingshan National Park. The new administrative responsibilities meant enlargement of the preservation and management duties within the nominated property. Most recently, on 1st October, 2005, in recognition of its outstanding geological and landscape qualities, Mount Sanqingshan was designated a National Geopark by the Ministry of Land and Resources. In March 2006, Mt Sanqingshan was inscribed on the List of National Natural Heritage by the Ministry of Construction.

The Management Committee of Mount Sanqingshan National Park is the only administrative agency which is responsible for management, protection and utilization of natural resources of the National park.

1.5 Nature, Function, Area and Division of Sanqingshan National Park

The scenery of Sanqingshan National Park in nature is characterized by the rare mountainous natural landscape, distinctive Taoism culture landscape and the ecological landscape of rich vegetation. It is a national park being functioned for sightseeing and popular science education.

Functions of Mt Sanqingshan National Park: to protect diversified types of granite landform, geologic remains, ecologic environment and water resource, to implement an effective management of the park as a whole; predicated on sustainable ecology and Taoism culture, using tourism resources such as granite landscape and Taoism culture to promote sightseeing and tourism, science education and scientific investigation, and sport activity and physical training. Furthermore, to promote the socio-economic and cultural sustainable development, and conservation and restoration of ecological environment.

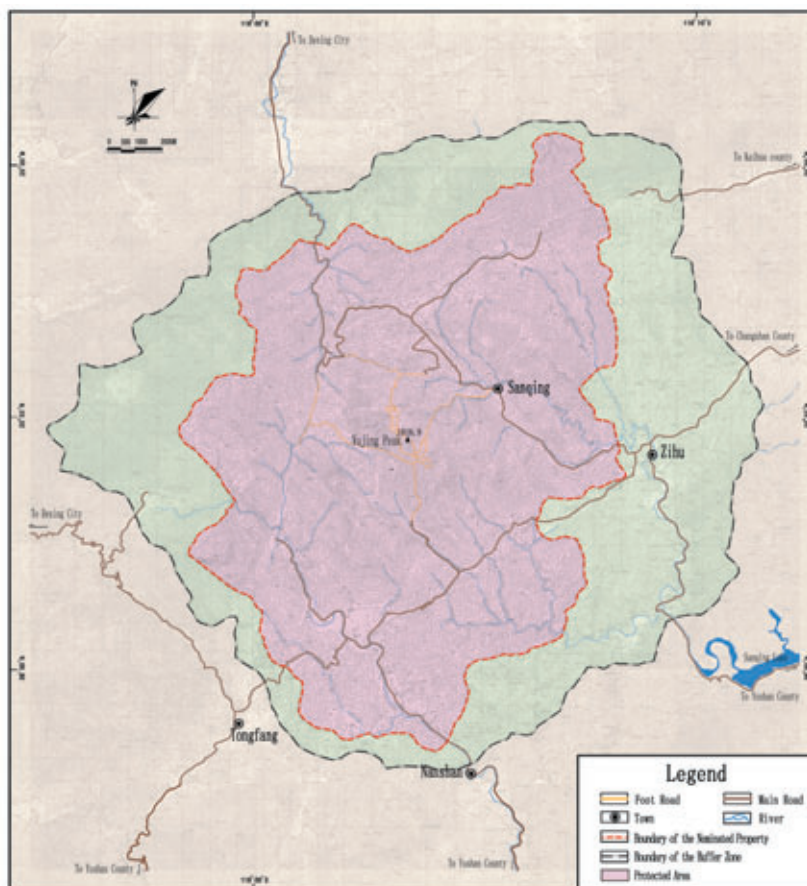


Fig. 1.1 Protection areas of Sanqingshan nominated property

The area of Mt Sanqingshan National Park 22,950 ha. is the same as that of the nominated property (Fig. 1.1). The park embodies a core scenic area 3,780 ha., which in turn is subdivided into the ecological protection area 1,430 ha., protection area of historic relics 78 ha., protection area of natural landscape 134 ha, Protection area of geologic remains 1,145 ha. and finally tour and sightseeing area 993 ha. in accordance with ‘General Plan on Mt Sanqingshan National Park’.

1.6 Main Points of Plan on Management of Mount Sanqingshan National Park

1.6.1 Plan Maker and Responsible Organ

The Plan was drawn up by Administrative Committee of Mount Sanqingshan National Park based on approved ‘General Plan on Mount Sanqingshan National Park’(2003-2020) and ‘Operational Guidelines of World Heritage Convention’ (2005), also on ‘Regulations on Management of Scenic Zone of the People’s Republic of China’ by the State Council and ‘Regulations on Management of Mount Sanqingshan National Park of Jiangxi Province’. As many as possible the groups having vested interest in the area were absorbed to take part in formulation of recent Plan. The formulation of Plan had benefit of instruction from following departments of government: Department of Construction of Jiangxi Province, Development and Reform Committee of Jiangxi Province, Department of Land and Resources of Jiangxi Province, Provincial Department of Forestry, Provincial Bureau of Environment Conservation, Provincial Bureau of Tourism, Shangrao Municipal Government, and governments of relevant cities and counties, which have signed corresponding documents.

1.6.2 Goal of the Management Plan

(I) Organizing measures to achieve the development goal set out in general plan on Mount Sanqingshan National Park

The development goal set out in General Plan on Mount Sanqingshan National Park is: based on the international criteria on world heritage that acquainted during the process of the application and in conformity with the principles of planning on the national park: ‘Scientific Planning, Unitary Management, Rigorous Protection and Sustainable Utilization’ to strengthen the conservation of natural environment, in particular to protect the geomorphologic landscapes of granite peak forest, the vegetation and biodiversity, and Taoism culture features. In detail the goal is to strengthen the construction of infrastructure and facilities for travel and tourism; to implement the recondition and restoration of the key scenic area of Tiyunling, which will lay a foundation to realize the target ‘Travel up mountain while living down mountain’; and furthermore to make Mount Sanqingshan as a pillar of Shangrao tourism property that provides economic incentives for regional harmonious development; in consequence, to promote the regional speeded harmonious development of surrounding cities and counties. Meanwhile, Mount Sanqingshan is expected to be built into a first rate at home and renowned in the world scenic zone.

(II) To guarantee effective protection of natural sceneries in the property to meet the requirements for world heritage

In accordance with the Operational Guidelines for the Implementation of the World Heritage Convention (section IID, UNESCO, February 2005), this Proposal to inscribe Mount Sanqingshan on the World Heritage List is based on:

Criterion vii: contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

The territory of the nominated property contains landscape resources of exceptional beauty and richness. Its aesthetic quality is one that combines remarkable granite landforms with a diversity of rare, old and beautifully formed tree species, abundant wildlife, near and distant vistas and spectacular meteorological effects. The landscape is truly stunning - all the more remarkable because of the high scientific values it holds, making Mount Sanqingshan an outstanding natural museum.

The nominated property includes 5 scenery types, more than 100 scenic spots and 361 individual landforms of note. It displays an extraordinary landscape constructed of fantastically shaped granite landforms. In particular, the landscape represented by peak forest and pictographic stones (naturally sculpted rocks) is of incomparable rarity and aesthetic value. These features are best preserved on Mount Sanqingshan because, unlike most other granite mountains of China and the world, it escaped the exaration and leveling of glaciation. The Sanqingshan landscape is therefore unique.

The distribution of the landscape resources within the nominated property is remarkably consistent in character and integrity. Such consistency across the whole property demonstrates great scientific and aesthetic integrity. Nevertheless, within the broader landscape type, sub-types of scenery occurring in different parts of the mountain also demonstrate a relative local integrity. The landscape integrity is fundamental in enabling effective management of the nominated property and its ongoing importance as a natural treasure, recreational resource and scientific laboratory.

Criterion viii: be outstanding example, representing major stages of Earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.

The principal focus of the nomination is on the property's granite geology and rare granite landforms, although also of great importance the site is located within a local geology that spans over 1 billion years of earth history and holds evidence of some of the Earth's most important geological events.

Mount Sanqinshan is a granite mountain massif located within the suture zone formed by the collision of the Yangzi and Cathaysia lithospheric plates during the Late Neoproterozoic ($850 \pm \text{Ma}$). The granitoid rocks in the nominated property and its surroundings are represented by four genetic types: M, I, S and A. Except Middle-Neoproterozoic M type, the Late Mesozoic I type, S type and A type, evolved in sequence over time. These correspond to the early, middle and late stages of crustal movement and evolutionary development of

the granite magma and its intrusion into the crust. The depth of granite emplacement varies, belonging to Hypogene (Sanqingshan, Lingshan), hypergene (Tongchang) and subsurficial (Yinshan, the volcanic vent), Rock texture also varies, the rocks exhibiting: granite texture, porphyric texture, rapakivi texture and texture of mixed magma, and miarolitic structure. It is rare to find an area of the world such a rich granite sequence and assemblage of high scientific significance.

Uplift and stripping of the granite, along with its fracturing, provided just the right conditions for the formation of a remarkable collection of granite landforms, not seen in such quantity or diversity of form anywhere else in the world. The granite landforms also hold evidence of different stages of their evolution.

In addition to the remarkable granite geology, the nominated property holds evidence of five geological events of global significance:

- closure of the Middle Neoproterozoic South China Ocean and collision of the Yangzi and Cathaysia continental plates that further amalgamated to the supercontinent Rodinia
- Late Neoproterozoic break-up of Rodinia and the onset of the Nanhua (Cryogenian) world-wide glaciation (Snow-Ball Earth)
- the Cambrian anoxic event, the Cambrian Explosion of Life and the Great Ordovician Biodiversification Event
- Middle-Late Jurassic to Early Cretaceous (Yanshanian) intracontinental A type subduction and orogeny,
- Late Cretaceous intracontinental extension orogeny and formation of basin and range.

Of further special note, the nomination property holds evidence of continuing uplift of mountains since the Quaternary Period and displays a history of the granite landforms, and the property also holds evidence of global environmental changes since the Mesozoic Era resulting in the intercontinental disjunct distribution of 68 genera of plants. The nominated property is therefore important to the world's scientific community, not only because it records major stages and significant events in the Earth's evolutionary history, but also because it provides a natural laboratory for the study of ongoing geological, geomorphological and biological processes.

Criterion ix: be outstanding example, representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.

The nominated property is a protected reserve for rare and endangered species that have survived from the Mesozoic and Tertiary Eras. Examples of these species are *Pseudotsuga sinensis* var. *gaussenii*, *Tsuga tchekiangensis* and *Liriodendron chinense*. Furthermore, Mt Sanqingshan served as the biotic refuge of East Asia during the last Ice Age. *P. gaussenii* (corresponding to *P. menziesii* in North America), occupies 533 ha. as a forest, and its monoculture area extends to 160 ha; it is associated with *Tsuga tchekiangensis* over much of the area, which is rare in the world. *Liriodendron chinense* (corresponding to *L. tulipifera* in North America), a geographical relict from the Quaternary, is distributed here in sectors. Mt Sanqingshan has 68 genera of the plants found in the disjunct distribution zone across East Asia and North America, which account for 56.2% of the genera of this kind in China.

The nominated property is an outstanding example of the East Asia-North America intercontinental disjunct distribution of plant species. It is the key location in which to study plant community development and serves as a “natural laboratory” in which to study speciation and ecological processes, which have evolved through geological, palaeogeographic and palaeoclimatic changes.

It's further relevant that the nominated property is on the headwater of Xinjiang River which is an important tributary of Poyang Lake. Poyang Lake is also the greatest freshwater wetland in Yangtze River Basin. The freshwater biodiversity of Yangtze River is one of hot spots of WWF 'Global 200', thus, the nominated property exerts a great important influence on the protection of the freshwater biodiversity.

Of additional importance, the nominated property is a protected refuge for many rare and endangered species of animal, including *Taxus mairei*, *Pseudotaxus chienii*, *Tragopan caboti*, *Syrmaticus ellioti*, *Mutiacus crinifrons*, *Manis pentadactylus* and *Capricornis sumatraensis*. It is also one of the most biodiverse in China.

(III) To improve management of integrity of Mount Sanqingshan in conformity with requirements for integrity of world heritage

Integrity means the nature in completed station and the degree of being not damaged of any natural or cultural heritage: covering all components of outstanding universal value; having a large enough area to ensure comprehensive presenting the features and processes of the nominated property, representing its value and significance; curbing the negative effect and its degree as results of development and ignorance. If the biogeographical processes and geomorphological features are relatively stable and not disturbed by human activity, and the human activity of traditional and local communities are in natural state, and ecologically sustainable, they might be deemed to be in consistency with the outstanding universal value of the property.

As regards criterion VII, the integrity of Mount Sanqingsha National Park should include different sceneries and in structure integrated space, necessary to maintain its natural beauty; with regard to criterion VIII, the park should include, in natural relationship, all or most mutually connected and mutually reliable components of granite, and in structure integrated space; as criterion IX concerned, it should include a integrated space for vegetation growth and wildlife living.

Thereafter, Mount Sanqingshan National Park should meet the requirements on integrity of a property in following aspects: the subject of property is identified, having a large enough surface area for comprehensive and effective protection of morphological series of granite, geologic remains and relevant natural phenomena that meets criteria of world heritage; boundaries between subareas are clearly demarkated with mark post set up; improvement of effective protective regulations and rules; the General Plan laid down is implemented effectively; improvement of administrative system with staff structure reasonable for management; and identification of local community with the area and its participation in management of the park.

(IV) Ascertain the objectives of socio-economic development laid down in 'General Plan on Mount

Sanqingshan National Park, and decide on the orientation of development of the property in conformity with requirements set out in ‘Operational Guidelines of World Heritage Convention’

The objectives of socio-economic development laid down in ‘General Plan on Mount Sanqingshan National Park’ are: 1. By applying for inscription on World Heritage List further better the quality of the whole society in the area of Sanqingshan; 2. develop travel and tourism at a stable and reasonable speed; 3. predicated on the protection of environment, agriculture should be adjusted in economic structure and let cultivated land revert to its natural forest state, build a high efficiency diversified agricultural economy and an agriculture zone for sightseeing to promote the development of village economy; 4. Control the village construction and develop the village culture property by digging culture intension and building several distinctive villages with ecological agriculture; 5. improve the energy usage and production model of local residents to lower the pressure to the ecological environment; 6. improve the infrastructure facilities in local village communities, raise the culture and education level and set up a mechanism of property distribution to improve the local social living standard and material condition.

A world heritage may be used in different ways that is ecologically and culturally sustainable, however the government and its agencies shall entrust that the usage will not damage the outstanding value, and its integrity and authenticity; the usage should be sustainable for both ecology and culture.

(V) Ascertain the objectives of environmental construction and development laid down in ‘General Plan on Mount Sanqingshan National Park’

Protect rigorously all granite resources within the park, protect existing vegetation of the mountain forest, renovate and restore the damaged landscapes resulting from quarrying, cultivation and road building; protect natural water bodies and water sources and strengthen the protective measures on ground water sources; and rigorously match the state standards and standards set out in the Plan in treatment of man- polluted matter, such as sewage treatment and garbage disposal. The final goal of the environment construction is to build Mount Sanqingshan National Park into an environmentally graceful national park with integrity of geological and ecological landscapes, where construction in different affaires is developed in harmony.

1.6.3A Summary of Cause Contents of the Management Plan

(I) Scientifically and practically have been identified the components of the value of Mount Sanqingshan national Park and ascertain the space subjects of the park;

(II) The factors threatening the value subjects of the national park have been analyzed and the development orientation and corresponding manage targets of Mount Sanqingshan National Park set out;

(III) Parted in area and classified management projects and implement objectives have been put forward in conformity with protection requirements of the value components and space subjects of the national park.

2. Features and Values of Mount Sanqingshan National Park

Mt Sanqingshan is a spectacular granite mountain massif and the highest part of the Huaiyu mountain range, reaching an altitude of 1,816m a.s.l. at Yujing Peak. It occupies a part of a crustal suture zone (Suzhou-Dexing Fracture Zone) dating from the time of the formation of the Rodinia supercontinent in the late Neoproterozoic Era. With nearly 1 billion years of almost continuous geological evolution, and possessing evidence in its stratigraphy of many of the world's great geological events, Mt Sanqingshan is a pre-eminent world location for the study of the history of the Earth and plate tectonics. However, impressive as the geology is, the granite mountainous geomorphology, biodiversity and aesthetic qualities of the site are of equal international importance. Weathering and erosion of the granite has sculpted a wealth of remarkable landforms at a variety of scales, while the forest vegetation that clothes the mountain slopes contains world-ranking biodiversity and harbours internationally important rare and relict species. Together these features form a stunning visual landscape of towering peaks, columns, ridges and naturally sculpted life-like forms, all accessible in broad vistas and enhanced by seasonal meteorological effects.

2.1 Geomorphological Features of Mount Sanqingshan

Mount Sanqingshan is a tectonically uplifted rigid block of hard Yanshanian ultra-acidic, highly silicic granite. It is the massive nature of this rock mass, together with its fracture system, that provides the principal controls on the geomorphology and landscape of the mountain. At the surface the exposed faults and joints that cut the mountain have been exploited by runoff and percolating water. Over time, weathering, collapse and fluvial erosion along the lines and faces of exposed fractures have shaped Sanqingshan's landforms, from the major valleys and deep gorges, to the peak forests and pictographic stones.

2.1.1 Gorges and Valleys

Mt Sanqingshan is cut by a large number of deep gorges and bounded by major fault-guided valleys.

There are 23 main gorges distributed above 500m of elevation, with lengths of several thousand metres. Typically these gorges have steep, flat walls that form cliffs from tens to hundreds of meters in height. The deep and narrow gorges mostly have a V-shaped profile.

The gorges empty into large valleys formed along the lines of the three normal faults that bound Mt Sanqingshan (i.e. that have given rise to the triangular-shaped uplifted mountain block). These valleys follow the Fenglin-Zihu Fault Zone, Xiaoken-Bajiaowu Fault and Egongling-Xiaxiken Fault(Fig.2.1).

2.1.2 Granite Landform

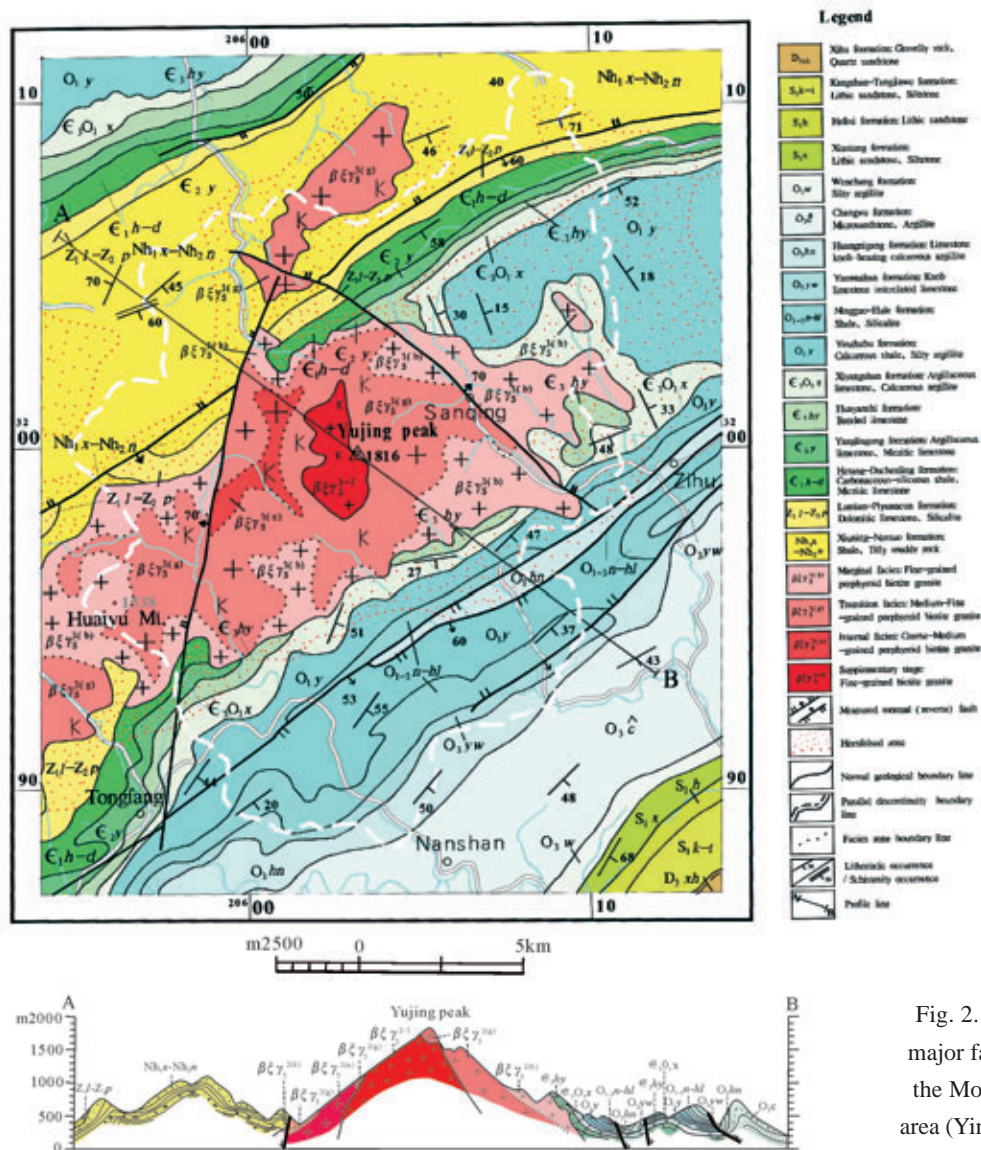


Fig. 2.1 Distribution of major faults and joints in the Mount Sanqingshan area (Yin Guosheng, 2006)

The nominated property has one of the world’s most spectacular and important granite landscapes, comprising an outstanding assemblage of landforms at varying scales. The landscape type is one known in China as ‘Peak Forest’ (literally, forest of stone peaks), and its outstanding feature are the abundance, diversity and high quality of the landforms. Particularly notable are the high concentration of these forms on Mt Sanqingshan and the presence of remarkably sculptured rocks.

The landforms are of nine different types, known as: overlapped peaks, peak wall, peak cluster, stone forest, peak pillar, rock cliff, gorge and pictographic stone (these last are naturally sculpted rocks, each having the shape of a recognisable feature, usually animal or human). This diverse range of features makes Sanqingshan an exceptionally important place in which to study the evolution of these unique granite landforms. The central scenic area of 2,800 ha. includes 48 individual peaks, 89 pictographic stones, and 361 individual landforms of note. The pictographic stones are particularly remarkable and life-like, there is nothing quite like them anywhere else in the world. Two of the most acclaimed figurative examples are the ‘Oriental Goddess’ and the ‘Gigantic Boa’, celebrated as natural wonders throughout China.

Evidence of the processes and stages of the formation of the landforms is extremely well-preserved, which has enabled the construction of a typomorphology. The main landform types are described in Table 2.1, and the most notable six types are described below.

Table 2.1 Granite landforms of Mount Sanqingshan, main types and typomorphic examples

| Type | Example name | Example location | Characteristics |
|------------------|-------------------------------|-----------------------------------|--|
| Overlapped peaks | Three ancestors of Taoism | 118° 03' 52.3" E, 28° 4' 57.5" N | Three large pyramid peaks: Peak Yujing as the major peak with elevation 1,816.9m, Peak Yuxu close to N side of Peak Yujing w/elevation 1,776m, Peak Yuhua lined to Peak Yuxu w/elevation 1,752m. Three peaks rising up to cloud to form pyramid like overlapped summit, just like three ancestors of Taoism: Yuqing, Shangqing and Taiqing. |
| Peak wall | Great Wall in heaven | 118° 03' 12.6" E, 28° 54' 46.4" N | To the north of Gangwan, Xihai, the peak wall looks like Chinese Great Wall, extending in 200°-205°100m long, and 15m thick, 60m high, vertical, w/flat surface, the peak wall is a well preserved granite landform, hence the name. |
| | Wanhu chaotian | 118° 03' 50.5" E, 28° 54' 28.6" N | With elevation 1,350 m, height difference 200m made up of seven vertical peak pillars, which like jade "Hu"(tablets) held before the breast of officials when received in audience by the emperor, hence the name. It formed, as granite body cut by EW and NS vertical joints, further subjected to weathering, denuding and scouring. It is the typical example for a peak wall evolving into a peak pillar. |
| Peak cluster | Peak cluster at Heavenly Gate | 118° 03' 41.2" E, 28° 54' 11.5" N | The cluster of lined peaks striking in NS direction at summit of Tiyunling, connected at bottom and spire-shaped at top, with diameter at bottom 5m-40m, height 20m-100m. Viewed from Reshang Mountain Cottage, like bamboos after spring rain, rugged and slender. The two main peaks in centre, uprising to touch cloud, like a gigantic gate, hence the name. |
| Stone forest | Yuling Stone Forest | | Located to southeast of Yuling Nunnery, composed of small prism-shaped pillar peaks which are 10m-20m high, w/diam.8m-12m, tall, straight and majestic. Rock body cut by EW and NS vertical joints, further subjected to weathering, denudation and scouring to form the landform. |
| Peak pillar | Oriental Goddess | 118° 03' 58.3" E, 28° 54' 30.8" N | At elevation 1,182m, rising to 86m, the peak is typomorphic for Yanshan granite, cut by two sets vertical joint into pillar peak, further subjected to horizontal joint cutting and collapse to form two sections, still further subjected to weathering and denudation to form a figure of goddess, remarkably true to life. |
| | Gigant Boa | 118° 03' 51.2" E, 28° 54' 51.2" N | Elevation 1,200m, height 128m, diameter 7m-10m, it is typomorphic for granite, cut by joints to form NS strike peak wall, then cut by EW joints to form peak pillar—"Boa's body", further subjected to scouring, collapsing, and weak weathering and denuding to form "Boa's head". |
| | Guanyin admiring moon | 118° 03' 51.4" E, 28° 54' 19.2" N | Located 50m northwest of Yu Emperor's summit. Upper part 15m high, resembling Guanyin Buddha, lower part 50m high, w/diam. at bottom 20m, diam. at top 8m. Peak pillar was formed, when granite cut by two sets of vertical joints; then it was subjected by horizontal joint cutting, and weathering, denudation and collapse. To form pictographic stone. |

【Overlapped Peaks】(Photo2.1). This term denotes a cluster of giant peaks, such as the ‘Three Ancestors of Taoism’ which has individual towers with a vertical range of up to 1,000m. The granite peaks formed by erosional dissection of the rapidly uplifted mountain block.

【Peak wall】(Photo 2.2). This feature has the appearance of a tall stone wall (i.e., with two parallel faces and an even thickness top and bottom). Typomorphic examples are the ‘Great Wall in Heaven’, ‘Double Wall at Xihai’, or the finger-like peak wall pillars such as ‘Wanhuchaotian’ and ‘Jujie Stone’.

【Peak Cluster or Peak Forest】(Photo 2.3). This is a cluster of smaller peaks or spires all connected to one another at the base. While the cluster of spires indicates dissection at one level, the base is not usually dissected and may represent a new erosion surface provided by uplift and associated downcutting of the bounding gorges. Typomorphic examples are ‘Peak Cluster at Heavenly Gate’ and ‘Peak Cluster at Qiong Platform’.



Photo2.1 Overlapped Peaks



Photo 2.2 Peak Wall



Photo 2.3 Peak Cluster

【Stone Forest】(Photo 2.4). A stone forest is a cluster of small-scale prism-like peak pillars, looking more like traditional ‘tors’. An example is the ‘Yuling Stone Forest’ in the northeast of the nominated property.

【Peak Pillar】(Photos 2.5). This is a single column of granite, usually isolated by deep clefts and gorges. Peak pillars range from 10m to over 100m tall, perhaps the most spectacular and celebrated being the 128m high ‘Gigantic Boa’. They vary from tabular to prismatic columns, although some have a broader, rounded form (e.g., ‘Oriental Goddess’ and ‘Guanyin enjoys Music’).

【Stone Cone】(Photo 2.6). This feature is a pillar with a rounded body that tapers towards the top, although there is great variety of shape and height (usually less than 5m). Examples are ‘Penguin Stone’, ‘Double Breast’ and ‘Rhinoceros Stone’.

【Pictographic Stones】 (Photo 2.7). On the overlapped peaks, peak clusters, peak walls and peak pillars, weathering, erosional scouring and uneven collapse have sculptured the rocks into wonderfully figure-like shapes. These may be genetically sub-divided into: a) scarcely distributed figure-like stones principally resulting from spheroidal weathering, such as the ball-like ‘Bottle Gourd Stone’ or ‘Celestial Turtle Searching in Sea’; b) a series of other pictographic stones resulting from a variety of erosion processes: cusped stones such as ‘Celestial Fingers’, ‘Fairy and Shoes’, ‘Rhinoceros Stone’, ‘Crane Peak’ and ‘Snail’, and some features of individual form, such as ‘Fox Gnawing a Chicken’, ‘Gehong Making Pills of Immortality’, ‘Leopard Cat Waiting for Mouse’ and ‘Zhuangzi Teaching Taoism’.



Photo 2.4 Stone Forest



Photo 2.5 Peak Pillar



Photo 2.6 Stone Cone



Photo 2.7 Pictographic Stones

2.1.3 Waterfalls, Ponds and Springs

The abundant seasonal rainfall and run-off provides Mt Sanqingshan with many impressive waterfalls . The eight most important waterfalls lie mostly at the lower and middle parts of the mountain, between the 500m and 1,000m contours. Waterfalls with a fall of 10m-30m and a width of several to tens of metres have three characteristic features: a ‘stone gate’ at the top through which the water plunges, a hanging wall, and a pond, usually full of blue-green water, at the bottom. Two types of falls are present: those formed where water passes over a cliff formed when rock has fallen away from one side of a fault or joint, and those formed due to erosional back-cutting of the headwall. Examples of impressive waterfalls are Longtan Waterfall at Baji, Yulian Waterfall, Shijian Waterfall and Bingyudong Waterfall.

Lakes and ponds on Mt Sanqingshan are mostly associated with active streams and waterfalls. Although their waters are pure, they usually appear bluish green. They each occupy an area tens of m², may be several metres deep, and were formed by fluvial scouring at the intersections of faults and/or joints. Examples are Shigu Pond, Yunu Pond and Wucebiyu Pond.

As groundwater is stored in the myriad of joints and faults that cut the mountain, there are many springs on all sides of the mountain. Some of the larger springs are Gudan Well, Luquan Well, Yuan Spring and Yumen Spring.

2.2 Biotic Features of Mount Sanqingshan

Based on the Udvardy Classification System, the organisms in the Nominated Property belong to the China Subtropical Forest Province of the Palearctic Realm. Mount Sanqingshan boasts a particular high biodiversity. Identified so far in the property are 2,373 species of higher plant (including sub-species, the same below) and 401 species of vertebrate. In addition, 45 species are listed in the IUCN Species Red List, 146 species are listed in CITES APPENDIX I, II, III (1995), 144 species of animal and plant are listed in the China Species Red List, and 79 species are designated as National Key Protection wild animals and plants in China (Table 2.2). 68 genera of spermatophytes are of East-Asia and North America disjunct distribution character, most of them being geographic relics. Poyang Lake and its surroundings is the most important fresh water lake and wetland. Research on Biodiversity of Yangtzi River is assigned as one of Global 200 of WWF. The nominated Property therefore exerts a significant influence on the conservation of biodiversity in yangtzi river Basin.

Table 2.2 Known species of rare and endangered animal and plant in the nominated property

| Organism | IUCN Red List | CITES Species | China Red List | National Key Protected Species |
|----------|---------------|---------------|----------------|--------------------------------|
| Plant | 22 | 92 | 49 | 26 |
| Animal | 23 | 54 | 95 | 53 |

2.2.1 Flora

Mount Sanqingshan is located in the eastern area of China belonging to the Sino-Japanese flora domain of the East Asia flora zone. The Vegetation type of Mount Sanqingshan is diverse and shows a typical mountain vegetation character, belonging to the type of middle mountain humid evergreen broadleaved forest in the east of China mid-subtropic zone. There are 2,373 species (including subspecies) of higher plants, which belong to 984 genera of 253 families. Among these species, there are 368 species of Bryophyta from 165 genera of 65 families; 179 species of Pteridophyta from 71 genera of 34 families; 24 species of Gymnospermae from 22 genera of 6 families, and 1802 species of Angiospermae from 726 genera of 148 families (as shown in Table 2.4). Accordingly, this region not only harbours some of the most abundant plant species growing in the middle subtropical evergreen broadleaved forest in China, but it is also the world distribution centre for *Pseudotsuga* genus of the Pinaceae family, in particular, *Pseudotsuga gaussenii*. Many kinds of fungi and lichens in Mount Sanqingshan are also well-represented in the ecosystems (Table 2.3).

Table 2.3 Higher plants in the nominated property

| Taxa | Family | Genera | Species |
|--------------|--------|--------|---------|
| Bryophyta | 65 | 165 | 368 |
| Pteridophyta | 34 | 71 | 179 |
| Gymnospermae | 6 | 22 | 24 |
| Angiospermae | 148 | 726 | 1802 |

(I) Vegetation types and vertical zonation

There are 9 vegetation types in Mout Sanqingshan, including evergreen broad-leaved forest, warm temperate coniferous forest, warm temperate needle and broad-leaved mixed forest, bamboo forest, warm temperate coniferous forest, temperate needle and broad-leaved mixed forest, evergreen and deciduous broad-leaved mixed forest, coppice forest, and mountain top meadow coppice forest also called embryo-forest(Fig 2.2).

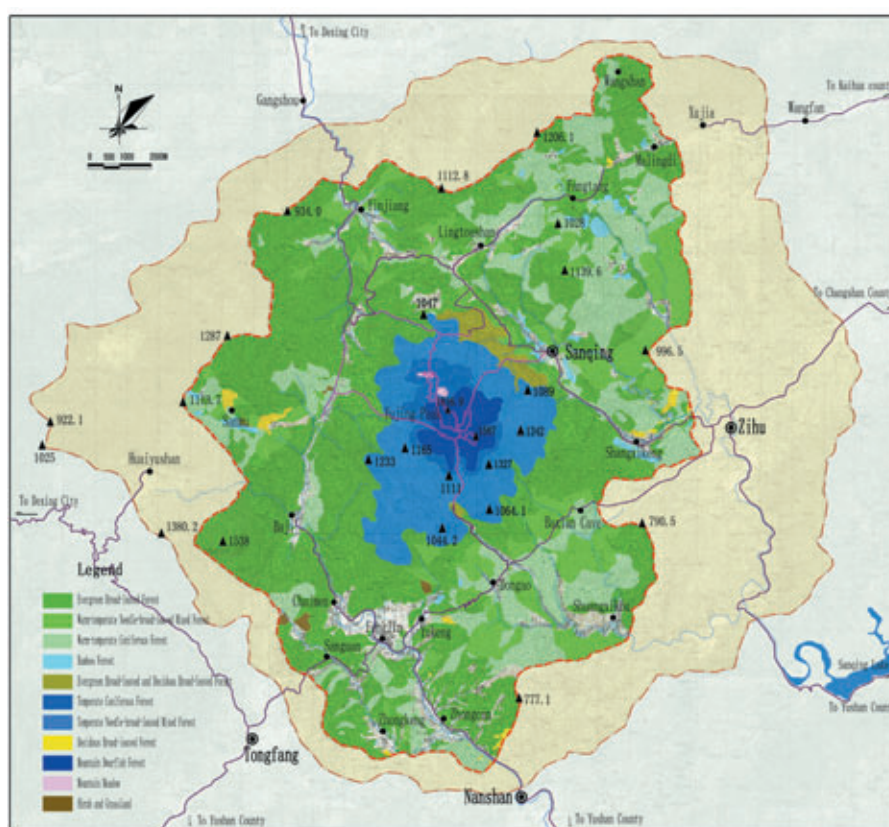


Fig. 2.2 Vegetation Map of Mount Sanqingshan Nominated Property

(II) Important biome distribution area

Mount Sanqingshan has 68 genera of plants found in the disjunct distribution zone across East Asia and North America, accounting for 56.2% of the genera of this kind in China (121 genera). It is one of the major preservation sites harboring these types of plant, including *Torreya* of the Taxaceae family, *Magnolia* of the Magnoliaceae family, and *Hamamelis* of the Hamamelidaceae family. These genera present in the disjunct distribution zone across East Asia and North America were once thought to originate from the old tropic zone (notably the Mid-Asia tropic mountain region), before the Tertiary Age in East Asia and South East Asia (Palaeocene and Eocene periods).

It has been pointed out (Lin Ying, 1986) that Jiangxi Province is an important originating centre for the Chinese flora forming part of the East Asia-North America flora system. Analysis of the flora of Mount Sanqingshan indicates that this area is the primary core of this flora in China and that the composition of the flora system corresponds to that found in the south-eastern and western parts of North America. This knowledge is important for the study of geology, palaeogeography and the evolution of palaeo-organisms on both continents.

(III) East Asia - North America Phytogeographical kinship

The botanical richness of China is unrivalled in temperate latitudes. With an estimated more than 30,000 species of higher plants, China holds one-eighth of the world's total plant species, including thousands endemic to China. By comparison, in North America, the United States and Canada contain only about 20,000 native plant species. The great plant diversity of China is the product of many interacting factors, including topography, climatic variation and ancient geological history. These have combined to produce a wide range of ecological environments, unparalleled in any other country. Nowhere else within the borders of a single country is there to be found an unbroken connection between tropical, subtropical, temperate and boreal forests. It is splendid that for the most part, these forest vegetations can be found in one special place – Mount Sanqingshan.

2.2.2 Animal

According to the classification of zoogeographic zoning in China, Mount Sanqingshan is located in the Oriental Realm. However, in terms of composition, it shows distinct characteristics of the Oriental Realm and is mixed with some characteristics of the Palaeoartic Realm. Of the Amphibians, Reptiles, Birds and Mammals, those species belonging to the Oriental realm account for 70% and those derived from the Palaeoartic realm account for only 30% (Table 2.4). The zoning of insects is extremely complex with the primary types being the Hindustan–Malaysia system of the Oriental Realm and the Hindustan Himalayan HuaXi system. Some species in the Oriental Realm are also represented in the Palaeoartic Realm. The latest survey shows that there are 180 species of Butterfly in 113 genera in 11 families in Mount Sanqingshan, including 25 species of Papilionidae.

2.3 Features of Natural Landscape on Mount Sanqingshan

Table 2.4 Indigenous vertebrates in the nominated property

| Type | Order | Family | Species |
|----------|-------|--------|---------|
| Pisces | 3 | 12 | 36 |
| Amphibia | 2 | 7 | 23 |
| Reptilia | 2 | 11 | 49 |
| Aves | 17 | 55 | 226 |
| Mammalia | 8 | 22 | 67 |
| Total | 32 | 107 | 401 |

While the granite landforms are the most valued component of the Sanqingshan landscape, other landscape resources are important, both in their own right, and also in building a completely integrated landscape system. The five landscape qualities that make the area one of the most unusual and beautiful landscapes of China and the world are: the granite morphology, the impressive meteorological effects, the hydrological system, the biodiversity, rare species and mountain ecosystem, and the Taoism cultural landscape unique to China at this site. The nominated property includes 7 scenic areas, over 100 scenic spots and 361 individual landforms of note.

2.3.1 Granite Morphological Landscape Resource

The granite morphological landscape has outstanding aesthetic and scientific values. Broad vistas of the mountain are truly spectacular, easily rivalling any in the world's other granite mountain landscapes, while at the smaller scale the various landforms such as peak forest and pictographic stones hold great interest in their detail. The pictographic stone landscape of Sanqingshan is widely celebrated for its remarkably like-life natural sculptures, such as the Oriental Goddess, Gigantic Boa, Wanhuchaotian, Colorful Screen at Ninth Heaven, Thousands of Peaks Competing for the Best, Three Dragons Rushing to Sea and Guanyin Enjoys Music (Table 2.5).

2.3.2 Picturesque Meteorological Landscape Resource

Various special meteorological phenomena occur over Sanqingshan and greatly enhance the spectacular nature of the landscape. The most important of these phenomena are: Cloud Sea (the rising of clouds around the mountain massif, frequently to a height lower than the highest footpaths, so that visitors can look down on the upper surface of clouds), Cloud Waterfall (where the cloud tumbles over the highest peaks, rather like a broad waterfall), Sanqing Divine Light (the halo effect commonly seen under special light conditions in mountainous areas), Five Colors Road in the Clouds (beautiful diffraction of light through the cloud cover to provide a number of distinct colours), and Meteor Showers (easy visible because of the high quality of the air over Sanqingshan). In addition, there are many days during winter when the mountain is blanketed in snow, creating yet another landscape type (Table 2.6).

Table 2.5 Types and characteristics of rare granite morphological landscapes

| Type | Name | Location | Landscape characteristics |
|------------------------------|---|-------------------------|---|
| Peak forest landscape | Peak cluster at Heaven Gate | Tiyun Ridge scenic area | Composed of 25 peaks, standing at an elevation of 1,500m-1,600m, with a relative relief of over 300m, surrounded in clouds all year around, it produces a spectacular view with great momentum. |
| Peak forest | Colorful Screen at Ninth Heaven | Yujing Peak scenic area | Standing at an elevation of 1,680m, with a relative relief of over 400m; single peak body is 380m in length and 87m in width; with overlapped peaks standing tall and upright, looking like a huge nature screen, thus producing a great view. |
| | Thousands of Peaks Competing for the Best | Tiyun Ridge scenic area | Standing at 1,500m-1,700m above the sea, over 30 peaks rise gradually from east to west, with their peaks forming different pictographic landscape, among which there are large areas of <i>p.gausenii</i> etc. densely planted, producing a God-making landscape painting. |
| | Wanhu-chaotian | Tiyun Ridge scenic area | Composed of 11 neatly standing rock peaks, with a single rock being 10m-15m thick, 30m-60m wide and 250m high. Standing at 1,300m above the sea level, they boast one of the rare landscapes in Sanqingshan. |
| | Yujing Peak | Yujing Peak scenic area | It is the biggest peak forest with the highest altitude and largest relative relief at Sanqingshan. Its three highest peaks are steep and great, clustered among hundreds of peaks of different sizes. Among the peaks, Yujing Peak stands at 1,816.9m above the sea level, and Yuxu and Yuhua at over 1,750m. |
| Pictographic stone landscape | Oriental Goddess | | Standing on the peak at an elevation of 1,300m, it is composed of a “Base” and “Goddess”, totalling 86m in height. The “Goddess” looks like sitting cross-legged; with clear five sense organs, she looks like gazing at things far in distance, with her hands put on lap full of kindness and affection. The vivid art piece reflects the power and might of the nature. It is called “Oriental Goddess”, implying the message that she is the beautiful goddess teaching people about cultivating methods and passing on prescriptions for curing diseases. The landscape is one of unique sceneries in Sanqingshan. |
| | Gigantic Boa | Tiyun Ridge scenic area | Rising from the valley at 1,260m above the sea level; the stone pillar is 128m high, with diameter of the finest part of the pillar only 7m, and of the widest part 30m, it looks like a vivid Python, true to life and incredible. It is also one of the landmark sceneries in Sanqingshan. |
| | Guanyin Enjoys Music | Tiyun Ridge scenic area | Standing on the top of peaks, with an altitude of 1,600m, it is composed of three overlapped peaks. The back peak is like a Guanyin in a dress smock, putting hands together praying; the front two peaks, one is the lute modelling, the other appearance shape Taoist priest, from afar, it looks like a Taoist priest playing the lute and Guanyin is savoring a piece of beautiful music. |

Continued Table 2.5 Types and characteristics of rare granite morphological landscapes

| Type | Name | Location | Landscape characteristics |
|------|-----------------------------------|-------------------------|---|
| | King-Monkey presenting a Treasure | Tiyun Ridge scenic area | On the peak top of over 1,530m above the sea level, stands a lonely huge stone, which is 28m in height. It looks like Monkey King in Chinese mythical novel, holding a treasure in hands, serious looking, who is piously presenting the treasure. It is also one of the rare landscapes of Sanqingshan. |
| | Three dragons rushing to Sea | Tiyun Ridge scenic area | Located at the west side of Yuhuang Peak in Nanqingyuan, at an elevation of 1,560m. Three peak columns rise directly into the sky, with an average height of over 130m, just like the form of “Oriental Dragon” representing Chinese People, which is blowing a cloud and rising up in the sky, thus achieving peak perfection with great momentum. |
| | Penguin presenting a peach | Tiyun Ridge scenic area | Located among valley at an elevation of 1,300m. A huge saucer peach is surrounded by several naïve looking little penguins (only 3m tall). In such a grand valley, it is rare to have such refined small photographic stone microlandscape, which should be an unsurpassed creature of Mother Nature. |

Table 2.6 Types and characteristics of meteorological landscapes

| Type | Name | Location | Landscape characteristics |
|--------------------------------|-------------------------------|--|---|
| Meteorological landscape | Sanqing Divine Light | Main peak of Yutai, Yujing and Sanqing Temple | During summer and winter, the sun shines again after rain, human shape will be wrapped in a colorful halo in the misty dawn; the halo follows closely the shape, and the mysterious and magnificent phenomenon has formed a most rare meteorological landscape of the nature. According to Chinese folk custom, whoever encountering the landscape is the one with fortune. |
| | Colorful Road amid Cloud | Yutai, West Coast | If the sun shines again after rain, steam evaporates among overlapped peaks. Every time when big difference in air pressure occurs because of high altitude, there will be a colorful staircase spiraling into the sky, which is the so-called “Magic Staircase Ascending to the Heaven”, thus boasting a very strange and unusual view. |
| | Cloud Sea and Cloud Waterfall | Sea of Clouds: Yutai, Yujing Peak and Wind & Storm Pagoda Waterfall of Clouds: Xihai, Yuhua Peak, and Ziyanshi | Being in subtropical monsoon zone, Sanqingshan has abundant rainfall (with an annual average rainfall of 2,000mm). There is a magnificent view of the cloud sea at all seasons, with occasional cloud waterfall pouring down from the peak top, thus producing a great view. |
| Astronomic phenomena landscape | Sunrise at Sanqingshan | Yutai, Yujing peak and Wind & Storm Pagoda | As the main peak at Huaiyu Mountain range, Sanqingshan boasts the best place for watching sunrise with its high and steep mountain formation. In early morning, the sun spurts out, like a huge gilded hook, a glittering red cover, a blazing lantern and a flaming fire ball, boasting a gorgeous and magnificent view. |
| | Meteor shower | Sanqing Temple, Oriental Goddess | There is clear sky and bright moonlight at night on Sanqingshan, when meteor often passes in the sky. A dense gathering of meteor will produce the rare celestial phenomena landscape of meteor shower of various scales, and records of several landscape of the kind have been left. |

2.3.3 Ecological Landscape Resources and Rare Plant and Animal Resources

There are two aspects to this landscape quality. Firstly is the wealth of rare plants and animals, such as the ancient *Pseudotsuga gaussenii* that grows over large tracts of the mountain, as well as the untouched quality of the mixed ecological landscape. The richness and density of the forested cover, together with poor accessibility and negligible human impact, give to Sanqingshan a true wilderness quality. Secondly, the vegetation of the mountain and the conifers in particular blend wonderfully and greatly enhance the visual delight of the granite landforms (Table 2.7).

Table 2.7 Types and characteristics of rare plant landscapes

| Type | Name | Location | Landscape characteristics |
|-----------------|----------------------------|--|--|
| Plant landscape | <i>p. gaussenii</i> forest | Primitive forest to the west of Sanqing Temple | The same category as Douglas Fir, it is an outstanding example of intercontinental intermittent distribution type of plant community. It is rare for the genre to be densely growing here, covering a space of 160ha. Growing tall and straight, with needle-like leaves, it falls into the category of national Grade I preserved plant. |
| | Taiwan Pine Forest | Yutai Peak and Sanqing Temple area | Around Sanqing Temple, it is densely covered with ancient pine trees, which are over 1,000 years of age, and cover an area of 66.6ha. The unyieldingly standing firs form one of typical plant landscapes in Sanqingshan. |
| | Indian azalea forest | Above the elevation of 1,000m | There are such species as <i>Rhododendron simiarum Hance var. simiarum</i> etc., <i>Rhododendron fortunei Lindl</i> and <i>Rhododendron latoucheae Franch. et Finet</i> , etc., with tree age of over 1,000 years and height of 5m-6m, each of which is so big that one could just get his arms around. During May and July in each year, there is a magnificent view of the blooming azalea, especially at the section of Ten-mile azalea at Nanqingyuan and the north to Sanqing Temple. |

2.3.4 Landscape Resource of Lakes and Waterfalls

Flowing water in streams add life and energy to the whole scene and Sanqingshan's rich water landscape of rivers, lakes and waterfalls contributes significantly to the overall landscape quality of the mountain (Table 2.8).

2.3.5 Landscape Resource of Taoism Culture

Taoism is an ancient religious culture unique to China, from where it has spread to other countries in East Asia (e.g., Japan, South Korea and North Korea). Sanqingshan has been an important spiritual centre for Taoism since the East Jin Dynasty (A.D.317-A.D.420) and today historic Taoist stone structures, such as Sanqing Temple, Dragon and Tiger Palace and Wind and Storm Pagoda, remain important relics of the Taoism culture and add significantly to the cultural landscape of Sanqingshan. The Taoist heritage of buildings, crafts and

stone carving of Mt Sanqingshan still has an importance influence in both China and other countries(Table 2.9).

Table 2.8 Types and characteristics of lake and waterfall landscapes

| Type | Name | Location | Landscape characteristics |
|-------------------------------|--------------------------|----------------------------------|---|
| Lake landscape | Sanqing Lake | At the east of Mount Sanqingshan | With a storage capacity of 170 million cubic meters, the lake body is in a belt shape, winding among the mountains. It is 5,000m wide at the widest point and 58m at the narrowest on the lake. With breeze, ripples are produced, and high mountains, blue sky and white clouds get their reflection in the water, all forming an enchanting landscape of mountains and lakes. |
| Waterfall landscape | Yulian Waterfall | Shiguling Landscape | Being over 60m in fall and 30m in width, it pours from steep cliff, and spatters water smoke. Under certain angle in the sunshine, there may form a colorful rainbow, making tourists carefree and joyous. |
| | Longtan Waterfall | Baji Longtan | Hiding among the dense forest, Longtan Waterfall pours from the steep cliff, and its turbulent water is divided into two parts. The resonant water can be heard even from a place as far as beyond 8km. The waterfall has a fall of 21m, and its pool is surrounded by ancient trees, which is untraversed, thus boasting an excellent ecological environment. |
| Landscape at the river source | Source of Qiantang River | Fangtang | Qiantang River, the famous scenic spot for tide watching, has one of its major sources at Mount Sanqingshan, which is also the source of another river, Xinjiang River, the second largest river in Jiangxi Province. Most importantly, exuberant forest and excellent eco-environment are the foundation for the river source. |

Table 2.9 Type and characteristics of Taoism cultural landscapes

| Type | Name | Location | Landscape characteristics |
|------------------------------|-------------------------|------------------------------------|--|
| Stone construction landscape | Sanqing Temple | Scenic spot of Sanqing Temple | Once as “National Religion”, Taoism is the main part of China religious culture and it has a long history. Ge Hong, a famous alchemist in dynasty of “Dong Jin”(A.D.317-A.D.420) traveled here and made pills of immortality, and there is an ancient Taoism building reserved at Sanqingshan. Sanqing Temple, with an elevation of 1,532.8m, is the core and main part for ancient Taoism buildings on the mountain, covering a space of 2,300m ² . It is a typical stone construction of Taoism temple, with simple and unsophisticated architectural style. The site is close to mountain and water, which can avoid from wind draught but is exposed to the sun. With Nine Dragon Mountain at its back and dipper in its front, the Temple enjoys an excellent geomantic omen for Taoism. |
| | Dragon and Tiger Palace | To the northeast of Sanqing Temple | It is one of major ancient Taoist buildings on the Mountain; facing water at its three sides. Stone carvings of the two crouching tigers and winding dragons at both sides of the palace gate are especially precious, with dragons hiding among the walls and tigers crouching on the stones, which vividly imply the influence of China’s Taoism, thus having superlative historic study and aesthetic value. |
| | Wind & Storm Pagoda | Sanqing Temple area | Built during Ming Dynasty, the exquisitely built pagoda is a hept-layered and hexa-facade stone construction. After over 500 years, bearing sunshine and rain, the stone pagoda is in iron black color. It is located at the best place for watching sunrise. When the sun rises in the cloud sea, there is a magnificent view of the blending of red sun, white cloud and black pagoda, producing a grant natural scene with superb aesthetic value. |

2.4 Ecological Environment Features of Mount Sanqingshan National Park

Plants on Mount Sanqingshan show a clear vertical zoning. The main vegetation types are as follows: the evergreen and deciduous broad leaved forest, coniferous forest, coniferous and broad leaved mixed forest, and coppie forest etc. There are plants of Gymnospermae, Angiospermae and Pteridophyta developed. In the core zone are distributed genera *Pseudotsuga* and *Tsuga*, the typical plants of East Asia- North America disjunctive distribution type.

The parent matter of Sanqingshan's soil mainly is weathered porphyroid granite, granite and granodiorite. All the acidic crystalline rock are poorly fertilized, easy to be eroded. For the high humidity, thick mist, little sunshine and thick layer of withered leaves, there is a yellow soil between 800m and 1,200m at elevation, or called mountainous yellow soil. On summit above 1,600 m at the plain or depressions there is a gray-yellow meadow soil which contains plenty of semi-weathered rock fragments, acidic, and in character is a light textured soil, the distinctive type of soil on Sanqingshan Mountain.

Mount Sanqingshan is rich in surface drainage and springs and waterfalls, the only water source is the rainfall. It is a headwater of Xinjiang River. Limited by relief, the surface water system split into two parts, the southeastern streams run through gorges and contribute to Xinjiang River, while the northwestern streams flow through Lean River and join to Poyang Lake finally, in addition a tributary flows into Qiantangjiang River.

Mount Sanqingshan National Park boasts its pure water and the high quality of its air.

The nominated property has been little influenced by people, after settlers moved into the area about 300 years ago, displaced from the coastal zone by pirates. Even today, due to the geographical remoteness of the site on the border between three provinces, and because of the precipitous nature of the mountain terrain, Mount Sanqingshan remains difficult to access by the local and visiting public. With a resident population of just 5,790 within an area of 22,950ha, the nominated property remains very lightly populated. In addition, there is no industry located within the area and local people maintain a primitive farming system, which has little impact on the heritage and the natural environment, but rather helps to maintain it. Towns and tourist area are well equipped with facilities to treat waste water and garbage; while countryside lacks necessary infrastructure and not equipped with sanitary treatment system.

In the scope of Mount Sanqingshan National Park the farmland is still cultivated; the firewood is still being collected by villagers and remains an important source of household's fuel.

Harmful pests in the forest are natural enemy of the fragile ecosystem in the national park.

2.5 Outstanding Value and Conservation Meaning of Mount Sanqingshan

Outstanding value of Mount Sanqingshan National Park is exhibited in: geomorphology of granite, unusual

meteorological phenomena, hydrologic system, biodiversity, rare species and mountainous ecological system, and Taoism cultural landscape. Five qualities have made Sanqingshan outstanding granite landscape site in the world, and the unique one at home.

2.5.1 Scientific Value

- 1) a unique assemblage of granite landforms, the scale, diversity, quantity and quality of which are second to none.
- 2) an international exemplar that helps to explain the origins of granites and the context for their emplacement, particularly within the Circum-Pacific region.
- 3) international significance for 1 billion years of continuous geological history and the evidence it holds of many of the Earth's major geological events.
- 4) international importance for the study of intercontinental discontinuous distribution of plants species and relict plants.
- 5) one of the most biodiverse environments in East Asia.
- 6) spectacular natural beauty, different from any other granite mountain site in the world.

2.5.2 Aesthetic Value

- Not subjected to Quaternary glacial exaration, Mount Sanqingshan has well preserved spectacular granite landforms that made up the peculiar natural landscape. The rare and not comparable landscape is of a great aesthetic value. Compared with other granite mountains (some world heritage site included),Mount Sanqingshan is a unique one. It is the home for human's soul, the treasure of the world.
- The pictographic stones show superlative natural beauty and the power of nature. For example, 'Giantic Boa' and 'Oriental Goddess' were sculptured by the nature and give people a visual impact, appreciated as creatures of high aesthetic, artistic and conservation values. Sanqingshan is 'a homeland of cloud and mist, an artistic corridor for pine and rock', also appreciated to be 'an example for the classical landscape beauty of China'.

2.5.3 Composite Value of Cultural Landscape

- History of Taoism on Mount Sanqingshan may trace back very long. There are plenty of Taoism architectures remained, thought to be precious historical relics, which deserves the name 'open museum for Taoism'.
- Within Sanqing Palace Scenic Area, the general layout of the Taoism architectural compound had hidden the exquisite in a rough appearance, full of ingenious idea of plot, representing Taoist' thought on universe. Centered with Sanqing Palace, the different parts of the compound spread surrounding the palace in a clever integrity with the natural landscape both bring the best to each other. The building makes up an example for traditional Chinese architecture that used to be integrated with natural landscape.
- Well preserved Taoism culture as old as 1,600 years has deeply influenced the awareness of local residents, who have had intension to preserve the forest vegetation, on which they rely for existence. As

saying goes, each architecture says a legend.

2.6 State of Land Use and Its Influence in the Park

Human activity in the Sanqingshan area started long ago. There are 15 administrative villages within the park with population density 25.24 people/km², and 140.0people/km² in the buffer zone. In the surrounding of the nominated property has been existed agricultural activity. For the traditional method of cultivation, the agricultural activity in the buffer zone progressively invaded into the virgin land. So the traditional approach in land use threatens the conservation of ecological vegetation. With development of new industry (tourism) and more pursuit of local residents for modern life the human activity has been intensified, in consequence, more garbage has been produced, which surpasses the bearing capacity of the park, and threatens the core zone, potentially influences the natural state of Mount Sanqingshan. It imposes a pressure on the conservation of integrity of natural resources and natural environment of the nominated property. The township construction and infrastructure construction near the buffer zone of the property may influence the visual image, change hydrologic environment, to certain extent influence habitat and breeding of wildlife. Nevertheless, the outstanding universal value of the nominated property has not been much influenced(Table 2.10).

Table 2.10 State of land use of Mt Sanqingshan National Park

| No. | Name of land | Area(ha) | Of total(%) | Average(m ² /person) | Notes |
|--|-------------------------------|----------|-------------|---------------------------------|---------------------------------|
| 00 | Park planning | 22,950 | 100 | 13,099 | |
| 01 | Landscape sightseeing | 1,666.9 | 6.94 | 1,272 | |
| 02 | Tourism facility | 78.9 | 0.34 | 45 | |
| 03 | Used by local community | 200.6 | 0.87 | 141 | Counted for permanent residents |
| 04 | Communication and engineering | 94.5 | 0.41 | 53 | |
| 05 | Forest | 20,333.7 | 88.6 | 11,268 | |
| 06 | Gardening | 98.3 | 0.43 | 75 | |
| 07 | Farmland | 675.1 | 2.94 | 414 | Counted for permanent residents |
| 08 | Meadow | 0 | 0 | 0 | |
| 09 | Water body | 160.2 | 0.69 | 91 | |
| 10 | Detained | 271.8 | 1.18 | 207 | |
| In 2002 total population 17,520, note: (1) visitor0.2 million people once (2) staff 399 (3) local residents 16,337 | | | | | |

2.7 Travel and Tourism in Sanqingshan

As the location of Mount Sanqingshan was remote, and not easily accessible, the believers who came from neighboring provinces usually hiked a long way and climbed up to pay homage and burn joss sticks as a custom.

Since 1980s, in particular as the property was designated as a China National Park by the State Council, Mount Sanqingshan has been developing its tourism industry, and improving the infrastructure, and the

number of tourist arrivals has been growing rapidly. Since 2000 the nominated property has been the leading unit of the tourism of Shangrao City. There were successfully organized the International Rock-climbing Fair and the First International Symposium on Geology and Landscape of Granite. The main tourism productions are as follows: Peculiar peak sightseeing tour, Hiking and adventuring tour, Pay homage at immortal place tour, Ecological tour to virgin forest, Farmland landscape relaxation tour, Experiencing tour on custom of the national minority, Granite geology investigation tour, Biological investigation tour. Over 90% visitors choose 2 days tour.

As predicted in General Plan, the number of tourist arrivals in 2020 will be controlled under 0.9 million.

Tourism of Sanqingshan much influence on the subjects protected and values of Mount Sanqingshan National Park in many aspects:

1. Provide fund which the conservation and research work need.
2. Effectively demonstrated the natural heritage, the scientific and aesthetic values of the granite peak forest not only have been promoted to academic community, but also to the general public.
3. Conservation of landscape resources includes the conservation of biodiversity.
4. By releasing pressure on land, tourism became an important way to promote the regional socio-economic sustainable development.
5. Population load on the park and the load on the environment sanitary facilities have increased; while the increased architectural constructions have changed the traditional village landscape.

3. Development Orientation and Management Policies of Mount Sanqingshan National Park

3.1 History of Conservation and Development

A chronicle says that in the Shengping Period of the East Jin Dynasty Ge Hong after resignation from official position came to Mount Sanqingshan to cultivate himself and make pills of immortality; writing a book and expounding a theory, he propagated Taoism. Ge Hong has been appreciated to be a founder of Mount Sanqingshan. Another of the earliest men who much influenced Mount Sanqingshan is Wang Jian, the prefect of Xinzhou City, living in downhill to retreat. His descendant Wang Hu built up Sanqing Palace in Jingtai Period of the Ming Dynasty (1450-1456 A.D), adding landscape layout along the access road. There is a tablet hung up at the gate of Sanqing Palace, on which are three characters ‘Sanqing Palace’ written by Ministry of War Sun Yuanzhen. In the palace three ancestors of Taoism (Sanqing) have been preying, symbolizing a prosperous period of Mount Sanqingshan. After October of 1949 the conservation and development of Mount Sanqingshan were brought into the management of government. From 1958 to 1978 the production team of Fenshui Village was responsible for the management on the mountain. In 1978 a management group of Sanqingshan was established in Fenshui Village, the main task of which is to protect the woods and ancient architectures. In 1982 Party’s Committee and Regional Office of Shangrao organized a large-scale prospecting survey on Mount Sanqingshan’s Scenery. In 1984 Administrative Bureau of Sanqingshan Scenic Zone at county level was established. Mount Sanqingshan was designated as one of the first batch provincial rate scenic zones in 1985, and then was listed as one of the second batch national parks by the State Council in 1988. It was approved to be a national geopark in 2005 by Ministry of Land and Resources, and was inscribed on National Natural Heritage List in 2006. Since Administrative Committee of Mount Sanqingshan National Park was established in 1996, the protection, management and development of Sanqingshan became a daily business of local government. Major Planning and event that much influenced the conservation, management and development are thought to be as follows:

- Nov. 2005, Ministry of Construction adopted the implementation of General Plan on Mount Sanqingshan National Park of Jiangxi Province and Plan on the Core Scenic Area of Mount Sanqingshan National Park of Jiangxi Province.
- Sep. 2005, Ministry of land and Resources approved the implementation of General Plan on Mount Sanqingshan Granite Peak Forest National Geopark of Jiangxi Province.
- Feb. 2005, Shangrao Municipal Government approved ‘1+5’ Program on Development and Construction of Tourism in Shangrao City.
- July, 2006, 22nd Session of the Standing Committee of 10th People’s Congress of Jiangxi Province approved Regulations on Management of Mount Sanqingshan National Park of Jiangxi Province, which set up three grades of scenic areas and their limits.
- Thorough Controlled Planning on Waishuangxi Tourist Reception Area of Sanqingshan (approved by Department of Construction of Jiangxi Province in Jan. 2004).
- Readjusted Thorough Controlled Planning on Jinsha Relaxation and Tourist Center of Sanqingshan (approved by Department of Construction of Jiangxi Province in June, 2006).

● Thorough Controlled Planning on Fenshui Tourist Station of Sanqingshan(apprped by Department of Construction of Jiangxi Province),

By implementing above mentioned plans, Mount Sanqingshan has gone through the transition from the period that exploiting scenery resources and strengthening construction of infrastructure facilities to promote travel and tourism projects, through identification of the heritage value of granite peak forest in Sanqingshan, comprehensive and effective protection of granite geologic remains and presenting their geoscientific significance and aesthetic values, to the period that based on sustainable ecology and culture using scenery resources of Sanqingshan to promote the all-round participation of tourism of Sanqingshan in the local socio-economic and cultural development process.

3.2 Protection Condition

The value of Mount Sanqingshan national Park may be expounded in three aspects: scientific, aesthetic and cultural. The protection Mount Sanqingshan receives and threats it suffer are as follows:

(I) **Tourism development** Tourism of the nominated property has been playing a leading role in tourism development of Shangrao city, with its tourist reception scale reaching 298,000 people per year. According to a general planning, by the year of 2020, its annual total tourist reception will have been controlled within 900,000.

It is predicted to have a roar in tourist flow at the nominated property after its being enlisted into the directory of world heritage. With the implementation of natural forest protection project, there will be a marked decrease in income of its community residents, thus, there would be a big pressure for getting a economic source substitute. On this account, local government and residents always have great expectations for tourism development.

To protect the fragile eco-environment of the nominated property, it is regulated that environment volume of the site be controlled under 7,400 people per day. Tourist activities will not only bring about some tourist waste, but also impose some impact on aquatic environment quality of some scenic spots. Tourist facilities built within the nominated property will also impose some impact on its landscape, so it would be a major task for protection and management work to do standardized management on facilities construction.

Without any industry within the nominated property, its atmospheric environment quality reach Grade I criterion from ‘Criteria on Environment Air Quality’ (GB3095-1996). Large number of tourists and culture from other places have imposed large pressure on local culture of the nominated property, which might change its unsophisticated folkway and unique local culture.

(II) **Population growth** The nominated property has a hundreds of years in history for human habitation, and its outer boundary area is scattered with some villages. Human survival needs and social development have always been a conflict for demand of such natural resources as land and forest, and also for the

preservation of nature. Especially with the development of social economy and more pursuit of local residents for modern life, human activities have been intensified in the area, which imposes much pressure on preservation of integrity of natural resources and nature environment of the nominated property. It is various kinds of human activities that is the main potential pressure for the outstanding universal value and integrity of the nominated property. There is a low population density in the nominated property, which is 20.9 people per square kilometer; population density in the buffer zone is 140 people per square kilometer. With the practice of returning land for farming to forestry at the buffer zone, impact on natural eco-environment is weakened.

(III) **Mining activities** There are some quarries at the nominated property and the buffer zone. Being poorly equipped, the quarries have imposed seriously negative impact on forest plantation and environment of some area.

(IV) **Infrastructure construction** Around-mountain highway at the nominated property is built by going through the protection zone, which has destroyed part of the mountain body, thus imposing some impact on roadside plants and wild animals. There are transmitting lines, water conduits and several hydro power stations in the nominated property, which can be regarded as infrastructure for moderate use and maintenance. Heritage administrative department should ensure a possibly small impact on the nature environment from the design and management of all necessary infrastructure construction projects within the nominated property, and unnecessary construction or those imposing much impact on the environment must be forbidden or removed.

(V) **Denizen invasion** there is no denizen species at the nominated property, but forestry pests have affected natural plantation at part of the nominated property.

(VI) **Environmental pressure** Since its becoming a national key scenic spot, such problems as soil erosion and tree felling have been under efficient control, but tourism development has also brought about environment pollution, which imposes the biggest environment pressure on the nominated property. If construction of facilities within the site and influx of large number of tourists exceed environmental capacity and self-purification capacity of the nature system, it will impose negative impact on atmospheric environment, aquatic environment and geology as well as landforms. In addition, it will also affect plant and animal habitation, integrity and stability of ecosystem of the nominated property, and endanger the protection of biodiversity at the property.

(VII) **Deficiency in management momentum** In spite of efforts taken by the state and administrative departments, lack in funds and incapability have affected efficiency of the management work on the nominated property. To upgrade the management efficiency is also one of major tasks in management work of the heritage site.

3.3 Legal and Regulatory Basis of the Conservation, Utilization and Management

Law on Urban Planning of the People's Republic of China, issued by the National People's Congress in 1989

Forestry Law of the People's Republic of China, the National People's Congress, 1989

Law on Environmental Protection of the People's Republic of China, the National People's Congress, 1989

Water Law of the People's Republic of China, the National People's Congress, 1988

Law on Protection of Cultural Relics of the the People's Republic of China, the National People's Congress, 2002

Law on Wildlife Protection of the People's Republic of China,the National People's Congress, 1988

Law on Land Management of the People's Republic of China, the National People's Congress, 1998

Law on Water and Soil Conservation of the People's Republic of China, the National People's Congress, 1991

Regulations on Scenic Zones of the People's Republic of China, the State Council, Dec. 1st, 2006

World Heritage Convention, UNESCO, 1972

Convention of Biodiversity, Department of Environment Planning, the United Nations, 1992

Implement Measures of Tentative Regulations on Management of Scenic Zone, Ministry of Construction, 1987

Norms for Planning of Scenic Zones of the People's Republic of China, State Standard (GB 50298—1999), PRC,Jan., 2000

Regulations on Construction and Management of Scenic Zones of the People's Republic of China, Ministry of Construction, 1993

Standards of Environment Sanitary Management of Scenic Zones, Ministry of Construction, 1992

Standards of Security Management of Scenic Zones, Ministry of Construction, 1995

Notes on Strengthening Conservation and Management of Scenic Zones, Office Department of the State Council, NO. 23 [1995]

Approaches on Management of Plan Compilation and Approval of Scenic Zones, Ministry of Construction, 2001

Regulations on Management of Scenic Zones of Jiangxi Province, Order No.100, Jiangxi Provincial Government, July 28, 2000

Regulations on management of Mount Sanqingshan National Park, Jiangxi Province for 2003~2020, Standing Committee of Jiangxi Provincial People's Congress, 2003

General Plan on Mount Sanqingshan National Park for 2003~2020, Institute for Country and Urban Planning and designing of Jiangxi Province, 2003

Comment on a Memo Concerned with General Plan on Mount Sanqingshan National Park, Ministry of Construction,No.338, 2005

3.4 Planning on Management Mechanism

The nominated property covers the area of Dexing city and Yushan County which are under administration of Shangrao city, mainly as Sanqingshan National Key Scenic Spots under the administration of Jiangxi Provincial Department of Construction; its management involves coordination and harmony of several departments. On this account, Jiangxi Provincial Government set up a leader team composed of several

departments and organs for the application work of Sanqingshan to be a world heritage site, and a work office is also set up under the administration of the Provincial Administration of Construction. To ensure efficient management of the heritage site, the management mechanism should be further smoothed and defined.

1) On the basis of the leader team for application work of Sanqingshan to be a world heritage site, to set up Committee for World Heritage of Jiangxi Province with the deputy governor in charge of the work from the provincial government as the leader, composed of the Provincial Administration on Construction, Provincial Committee on Development and Reform, Administration on Finance, Administration on Forestry, Administration on Land and Resources, Environmental Protection Bureau and Administration on Culture of Jiangxi, etc., as well as representative from the local municipal government where the heritage site is located and those from administrative departments on scenic spots, thus boasting high administrative authority.

2) Office of World Heritage Management of Jiangxi Province is the enforcement department of the Committee, registered to be a department of the Provincial Administration on Construction.

3) A multi-discipline expert committee is to be set up in the Committee, to ensure the scientific management.

4) Responsibilities of the Committee for World Heritage Management and the Office are as the following:

- By depending on the existing management system, to propose a comprehensive and unified demand to the management of the nominated property; mechanism is to be set up to ensure regular communication and coordination between different departments; to coordinate negotiation between departments for nominated property protection and those for economic and social development of the site, and issue necessary policies, management principles and laws and regulations;

- To be responsible for persistent monitoring and regular assessment work on the nominated property. The monitoring and assessment work should be done in a comprehensive, independent and scientific way.

- To organize compiling and implementing work for the protection planning of the nominated property. Once the application is approved, all participant units are to be invited to review the existing planning; if needed, work is to be done to make all departments reach a consensus on the general planning. An overall revision work is to be done on the general planning in every five years, so as to ensure a reviewing on management standard, regulations, legal foundation and other supporting systems of the management work and its adjustment can be done promptly according to practical situation. Information collected in monitoring work can be reflected in management plan and its updated version. Office of World Heritage Management of Jiangxi Province is to act as an organizer and invite all management level for the heritage management work, including other government units and non-government organizations, to participate in the discussion about issues and strategies in revision of the general planning.

5) By following an existing management mechanism, management departments of the heritage site obey management of its superior administrative departments in terms of industry and obey the local municipal and county government in terms of social administrative affairs. On this account, all departments keep their responsibilities and authority limit unchanged in their management work. The difference lies in that after set-up of the world heritage site, coordination between all departments and protective monitoring work are to be strengthened by following the demand in world heritage management.

6) Figure for management mechanism of the world natural heritage is as follows(Fig. 3.1):

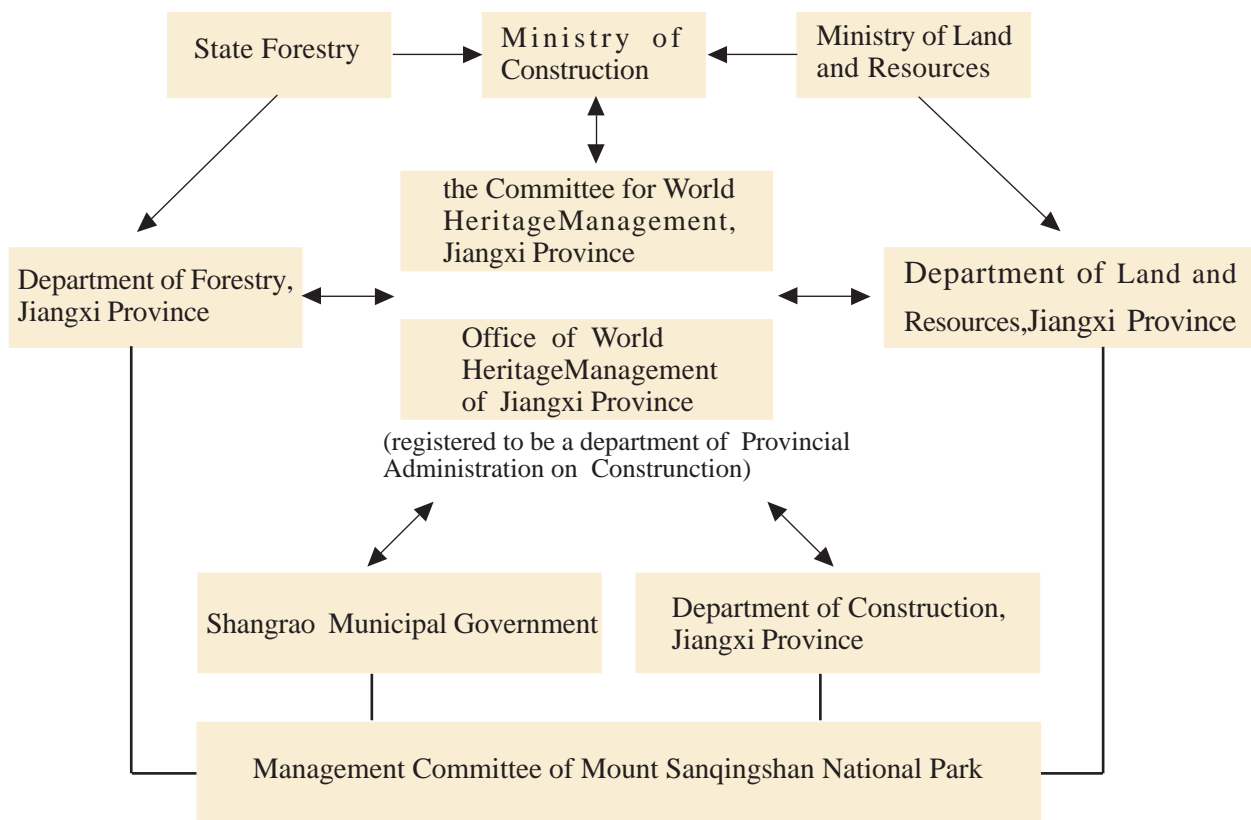


Fig. 3.1 Management mechanism of the world natural heritage

3.5 Orientation of Development

The orientation of development of Mount Sanqingshan National Park is focused on the management in regionalized and classified way, and the definition of the function for each zone and each scenic area in order that the value of resources of Mount Sanqingshan National Park will be sustainable and increased, and its utilization will be ecologically and culturally sustainable.

3.5.1 Protective Zones and Their Intensions

To ensure the feasibility and effectiveness in management of the nominated property, function zones are planned in the nominated property according to prescriptions on world heritage protection, so as to do pertinent management work. The site has been divided into core zone, protected zone and buffer zone, and the following principles have been taken into consideration when defining boundaries of the zones:

- 1) Boundary of the nominated property should cover important and exceptional natural eco-landscapes of Mount Sanqingshan;
- 2) Core zone of the nominated property is:
 - Natural heritage site for the rare granite geological and landform landscape;
 - The intercontinental disjunct distribution type of plant community with *p.gausenii* as the representative of the rare and precious plant communities;
 - Granite microlandform landscape represented by peak forest and pictographic stone;

- Gathering distribution of biodiversity and place of origin for important species sample;
 - Well preserved primitive ecosystem and natural sceneries;
 - Area with comparatively few human activities, with a population density less than 0.2people per square kilometer;
 - To include core scenic area in Mount Sanqingshan National Park;
- 3) Part outside the core zone is the protected zone, with a population density less than 30 people per square kilometer;
- 4) The buffer zone is the one to be controlled to ensure protection work of the nominated property.

(I) **Core zone:** includes the ecological protection area, historic relics protection area, natural landscape protection area, geologic remain protection area and scenery sightseeing area, the total area reaches 3,780 ha. The function of the zone is to protect the outstanding natural heritage with the rare granite geology and geomorphology, the rare and precious plant population of intercontinental disjunct distribution type represented by *p.gausenii* , the granite landscape composed of granite landforms, mainly peak forest and pictographic stones, and the site of biodiversity and of type specimen production for important species, finally the relatively well-preserved primeval ecosystem and natural landscape.

(II) **Protected zone:** includes three grades of protection areas out of the core zone, totaling 19,170 ha. The function of the protected zone is defined to keep the core zone with its granite peak forest landscape, plant community and general natural landscape away from the disturbance of human activities, to maintain the natural scenery and aesthetic integrity of the core zone, and to protect the hydrologic system and the integrity and continuity of regional water supply; meanwhile, to protect the granite geologic remains and other major aesthetic sceneries related to ongoing geological evolution processes.

(III) **Buffer zone:** i.e. the protective zone outside the Mount Sanqingshan National Park, occupying an area of 16,850 ha. The zone decreases the influence on the park from human activity, protects the core zone and major endemic plant communities, the Artesian area of the river basin and major cultural landscape, and to guarantee the integrity of granite heritage affected by ongoing geologic process.

3.5.2 Delimitation of Function and Activity for Zones at Different Levels

(I) **Core zone** In the zone, tree felling, hunting, housing project development, mining or industrial activities are prohibited; new construction of such large or medium scale infrastructure as highway or water conservancy projects or any extension projects for the existing infrastructure are forbidden; scientific research work should be limited to nondestructive collection, observation and monitoring activities. Tourism activities can be moderately developed, with tourist number being rigorously controlled under the range of holding capacity of the environment, and impact of tourism on environment should be monitored promptly.

(II) **Protected zone** Limited human activities are allowed in the zone for the existing human habitation. Agriculture should not be further expanded in the zone, and eco-environment on agricultural land on the slope with an angle over 25degrees should be recovered as soon as possible with the combined method of artificial promotion and natural regeneration; construction of highways and other infrastructures should be

rigorously controlled, and rigorous and scientific environmental assessment and monitoring must be done for the necessary projects. Dependence of residents within the zone on natural resources should be gradually reduced through getting substitutes, and existing mines should be gradually closed. Tourist number should be monitored when developing tourism to minimum their negative impact on the environment.

(III) **Buffer zone** Located outside the nominated property, in which, hunting and burning trees are prohibited; sustainable mechanism must be set up for the application of forest resources; returning land for farming to forestry should be done for farming land on slopes with an angle of over 25 degrees; industries and mines doing harm to the environment must not be constructed, and the existing ones should be closed gradually; rigorous environment assessment must be done on large or medium scale infrastructure construction.

3.6 Management Policies on Protection

3.6.1 Protection for Scientific Value

A spectacular range of granite landform types are present in the nominated property, including overlapped peaks, peak-walls, peak clusters, peak forests, stone forests, peak pillar, stone cone, gorge, cliffs and rich pictographic stones. In the central part of the mountain massif, an area of 2,800 ha., the different genetic types of granite are densely distributed. The landforms number 361 individual features of note, including 48 granite peaks and 89 pictographic stones. In recognition of the unique qualities of this landscape it has been termed in China the “Mount Sanqingshan Type”.

The landforms have evolved because of a unique combination of factors, including:

- a favourable lithology-structural relationship between the younger fine-grained granite of the stock in the center of mountain and the coarser granite of the triangular block which makes up the main mountain mass
- rapid uplift of the granite block from which they were carved
- the structurally massive and hard (resistant) character of the granite
- a rate of structural uplift that may have exceeded the rate of denudation
- a fan-shaped system of deep vertical fractures, crossed by horizontal ones
- a wet and warm sub-tropical monsoon climate which has promoted weathering
- pronounced erosion by rain and fluvial down-cutting controlled by the fractures in the rock

Of further significance, this landscape assemblage reveals a record of the endogenous and exogenous geological processes that have been extant since the Meso-Cenozoic Eras.

The nominated property is a mountainous area, composed largely of early Cretaceous A-type granite. In the property and within the surrounding area, are an M type “oceanic” plagiogranite dating from more than 900Ma, a relict from the Proterozoic South China Ocean, and a granite series formed during the Mesozoic intra-continental deep subduction. The latter was a product in response to subduction of the Paleopacific Plate, and gave rise to I, S and A types of granite, representing two tectonic-magmatic zones. Thus, with such a visible and complete tectonic-magmatic evolutionary sequence, Mt Sanqingshan is an extremely important area in

which to study granites, particularly the orogenic granite resulting from intracontinental deep subduction.

Nine to ten hundred million years ago the nominated property was a volcanic island in the South China Ocean. About 850Ma, the Yangzi Paleoplate and Cathaysian Paleoplate collided with each other and the ocean basin disappeared. The nominated property is thus located at the suture of two palaeoplates. Four well-preserved major geological formations can also be found from the Middle of the Neoproterozoic South China Ocean, the Neoproterozoic plate collision, the Mesozoic intracontinental A type subduction, and the Late Cretaceous intracontinental extension. These provide evidence of major geological events and the evolutionary history of the Earth. Mt Sanqingshan is an important area in which to study tectonic plate evolution and changes in the paleogeographic environment across one billion years of geological time. In this respect, the Middle to Neo-Proterozoic ophiolite-mélange belt has recently been discovered in the nominated property; it is one of very few such belts that has been found in the world. Dated to 901Ma., the ophiolite, together with oceanic plagiogranite and glaucophane schist formed through the high pressure and low temperature metamorphic regime. Formation of these different facies occurred at the same place within the nominated property, is an extremely rare occurrence.

Sanqingshan's Granite should be protected in conformity with the division of sceneries: exposed scenic spots and integrated spots. The exposed scenic spot means the geologic sections and scenes exposed naturally or by other ways; while the integrated scenic spot describes the geologic remains or sceneries, where the rock, geologic structure, hydrology, soil, relief and vegetations (including and plus land, fresh water and cave organisms) are in harmonious coexistence, which have a nature of scenery in structure, process and function. Any damage or loss of these components may influence the quality and attraction of landscape. In first case protection measure is to maintain the exposure state and preserve the ongoing geologic process, while in the latter case the harmonious situation should be remained stable, it is not allowed to damage or remove any components of the park, and reject any alien species invasion and decrease alien species of plant, which is the major approach to coordinate the protection works of both geodiversity and biodiversity.

Above mentioned scientific value and subjects have composed a basis on which to delineate the core zone, protected zone and their functions, the limitation of activities, the spatial requirements, and determine the threatening situation (Table 3.1).

Table 3.1 Types and typified examples of granite microlandforms in Sanqingshan

| | | | |
|---------------------------------|---------------------|--|--------------------------|
| Mount Sanqingshan National Park | Tiyunling S.A. | Most concentrated exquisite peaks and pictographic stones in Sanqingshan | 120 planned scenic spots |
| | Yujing Peak S.A. | The main summit, also the incarnation of Taoist ancestor, with spectacular landscape | |
| | Sanqing Palace S.A. | Unique Taoist cultural relics, the place to perform Taoist rites to save soul | |
| | Xihuatai S.A. | <i>Pinus taiwanensis</i> in a large area, nature combined with humane culture | |
| | Yulingguan S.A. | Rich in idyllic taste, typical stone forest | |
| | Bingyu Cave S.A. | Water landscape with plenty of waterfalls and ponds | |
| | Xianqiaodun S.A. | The best place to watch cloud sea and dawn | |
| | Other scenic Spots | Yulian waterfall, Baji-Longtan waterfall, Fuliangken reservoir | |

3.6.2 Protection for Biodiversity

The nominated property houses a range of ecosystem types found in East Asia, which encourages a rich biotic diversity. These include warm mountainous middle sub-tropical zone humid evergreen broad-leaved forest, which has become one of the most abundant ecosystem types in East Asia. The variety of higher plants is prodigious, with 245 families, 984 genera and 2,373 species present on Mount Sanqingshan. Animal life is equally prodigious, with 67 species of mammals, 226 species of birds, 49 species of reptiles, 23 species of amphibians, 36 species of fish and 1327 species of insects recorded in the nominated property.

However, many of these species are endangered and rely upon the sanctuary of the protected environment of Mount Sanqingshan. 45 species are listed in the IUCN Species Red List (2003); 92 floras and 54 faunas are listed in the appendix of CITES(1995); 144 species are inscribed on China Species Red list (2004); 26 floras and 53 faunas are under State-level Key Protection.

There are 68 genera of plants on Mount Sanqingshan which belong to the East Asia-North America inter-continental disjunct distribution type. They account for 56.2% of the total of the type in China (121 genera). Of particular note is the *Pseudotsuga gaussenii* community and *Tsuga chinensis* var. *tchekiangensis* which occupy a large area in the nominated property, to an extent rarely seen in the world. The area of its distribution reaches 533 ha., including a monoculture of *Pseudotsuga* extending to 160 ha., representing the historical record of the development of *Pseudotsuga* and *Tsuga* that corresponds to *P. macrocarpa* (Vasey) Mayr in the East Circum-Pacific orogenic belt of North America. It provides additional evidence of the close relationship between East Asia and North America, and of the plate tectonic events which have occurred in the Earth's past. It has world significance in terms of biogeography and biosystematics.

There are several surviving relict genera in the nominated property, including *Ginkgo*, *Taxus*, *Pseudotaxus*, *Amentotaxus*, *Cephalotaxus*, *Cryptomeria*, *Cunninghamia*, *Fokienia*, *Cyclocarya*, *Alnus*, *Fagus*, *Illicium*, *Schisandra* and *Disanthus*. Mt Sanqingshan is testimony to the evolutionary history of plants, spanning the Palaeozoic to the Quaternary, as well as being a 'biotic refuge' during the Quaternary Glacial Period.

The protection of the local plant community and recovery of the recovered forest lay on the basis of the protection and recovery of biodiversity in Mount Sanqingshan. The main measures are:

Carry out the legislative management and protection of the forest and afforested land and delineate the public welfare forest, meanwhile attach an importance to traditional way of local residents and village community for protection of primeval forest and propagate its meaning. Implement the policy of 'Close hillsides to facilitate the afforestation' to protect the plant community of *P. Gaussenii* and *Tsuga tchekiangensis* and to promote restoration of the organism community in Sanqingshan. Using landscape protected areas restore the plant community in natural way and added artificial way, and choose local species to promote afforestation of the locality. Using roadside trees and other afforested land to build a network of native plant community, further to build a plant species storehouse as a spreading center. Run economic and timber forests under centralized control, while prevent free felling in natural forests. By

leading villagers to build the methane generating pit change the household's energy structure and decrease the fuel collecting. Monitor and control the water inflowing into the public water body, strictly prohibit the man-made water pollution and polluted water to enter in the core zone, at the same time protect brooks and ravines. Stop the invasion of alien plant (animals) to the scenic areas, prevent and control the forest diseases and eliminate pests.

3.6.3 Protection for Aesthetic Value

Mount Sanqingshan displays a range of remarkable natural features and visual phenomena, providing the highest aesthetic, artistic and conservation values.

The statutory technical instrument "Standards of Planning in Scenic Areas" establishes a classification system for Chinese landscapes, both natural and man-made. This special instrument defines the parameters of 2 classes, 8 groups and 74 different types of landscapes. The landscapes of Mount Sanqingshan cover all of these defined classes and groups and 87.5% of types. Such a rich variety of landscapes in one nominated property is exceptional, both at home and abroad.

The Sanqingshan landscape is rich in fantastic rock formations. The granite landscapes of pictographic stones on Mount Sanqingshan are unsurpassed. For example, the 'Gigantic Boa' is a stone column rising to 128m, with a diameter at the narrowest point of only 7m; it has the appearance of a huge snake, true to life and incredible. The 'Oriental Goddess' is an unsurpassed creation of Mother Nature, appreciated as a natural masterpiece without equal. The goddess represents the figure, manner and expression of what is perceived to be the attributes of a perfect oriental woman. It reflects the power and might of nature. The fantastical formations and the natural artistic quality of the pictographic stones confer a superlative charm and aesthetic upon Mount Sanqingshan.

All of Mount Sanqingshan's landscapes are set within distinctive vertical zoning. The mountain massif, which rises steeply from 200m to 1,816.9m a.s.l. at Yujing Peak, has four distinctive zones. Composed of granite base rock, granite landforms and associated ecosystems, these zones can be differentiated in terms of altitude, structure, scenery, fauna and flora.

Zone I (1,500m-1,816.9m): is composed of granite overlapped peaks, peak cluster, with coniferous forest and low forest on the summit;

Zone II (1,000m-1,500m): is composed of granite peak wall, stone forest, peak pillar, and pictographic stone, with coniferous forest, broadleaved/coniferous mixed forest. This zone has been described as a "high mountain sculpted landscape";

Zone III (500m-1,000m): is composed of granite cliff, waterfall, gorge, with broadleaved/coniferous mixed forest and evergreen broadleaved forest;

Zone IV (< 500m): is composed of granite valleys and gentle hills, with evergreen broadleaved forest.

In summary, not only does the natural beauty of the nominated property have outstanding aesthetic and artistic value, but it is a remarkably important environment for the protection and nurture of endangered animals and plants. Mount Sanqingshan is also a place for people to discover the wonders of nature, a place

for painters, photographers, musicians, sculptors, writers and artists to work and to create, and a classroom for education, teaching and scientific investigation.

The protection of aesthetic value of Sanqingshan is based on the protection of scientific value, which includes maintenance of the nature, diversity, distinctness, integrity, continuity and a core zone without obstacle. Construction of large capacity buildings and unfeasible facilities are prohibited to avoid negative effect on the integrated granite peak forest landscape of Mount Sanqingshan, which benefits to exhibit the natural beauty of Sanqingshan.

3.6.4 Demonstration of Mount Sanqingshan's scenic areas

To scientifically and effectively demonstrate the scientific significance, biodiversity and aesthetic meaning contained in Mount Sanqingshan's landscape is the foundation and effective way to protect the landscape and realize the goal of development and utilization of Mount Sanqingshan, which is ecologically and culturally sustainable. Means and contents of demonstration are as follows:

(I) **Sanqingshan Museum**

The museum is an effective way to exhibit the natural and cultural landscapes. Acoustics, video, graphs, electronic 3D carton, specimen, models, explication and outlet are integrated to show the granite peak forest landscape and biodiversity of Moun Sanqingshan. It contains:

- Natural history and regional geology of Sanqingshan
- Granite of Sanqingshan: types, forms, evolution, geologic relics, scientific significance, aesthetic importance, model demonstration
- Hydrology and water resources of Sanqingshan
- Biodiversity of Sanqingshan
- Humane and cultural landscapes of Sanqingshan
- Development and protection of Sanqingshan
- Comparision with other mountain granites in the world
- Targets of development and long-term planning of Mount Sanqingshan National Park

(II) **Book, album and tour guidebook, including:**

- Sanqingshan granite peak forest
- Sanqingshan protection regulations
- Sanqingshan Taoism culture landscape
- Travel Sanqingshan
- Nature and History of Sanqingshan
- Tour guidebook of Mount Sanqingshan
- Protected nature and restored ecology of Mount Sanqingshan
- Proceedings of scientific research on Mount Sanqingshan

(III) **Mark system of Sanqingshan, including:**

- Registration of trademark Sanqingshan.

- Imaginative Mark Mount Sanqingshan was designated and conferred attributed tablets: National Park, National Natural Heritage, National Geopark, National AAAA Tourist Resort, Civic Virtues Tourist Zone.
- Regional mark system: General introduction to Mount Sanqingshan National Park, Explanation of scenic spots.
- Boundary mark system: Boundary of the core zone is remarkably delineated, boundary marker set up firmly, poster explanation is clear, with emphasized key content and understandable.
- Mark system at scenic spots and relics: Chosen scenic spots and relics showing granite peak forest and plants, such as *P. Gaussonii*, *Liriodendron*, coppie forest etc, hydrology, Taoism culture and history to mark and explain their intension and meaning scientifically, concisely and vividly.
- Mark in management and running system: Brand of the enterprise, staff uniform, mark of management organs, patrol mark, enterprise mark, mark for business network.
- Marks for tour guide and security: Mark at entrance and scenic areas, mark for tour routes (types and time scale), mark for sanitary facilities, marks for traffic control, mark for tour service, security marks (Fig. 3.2).



Fig. 3.2 Scenery Mark

- Quality mark of tour service: Marks of tour guide, restaurant, hotel, and commodity quality

(IV) Marks for promotion and marketing, including:

- Marks for advertisement and marketing on line: Establish and improve the marks on Internet for

advertisement, marketing and monitoring

- Marks for advertisement and marketing through public media: TV advertisement, Ad mark in public sites
- Regular and irregular exhibition in display windows

3.6.5 Security Management on Tourism and Tourists

Tourism (ecological tourism included) has been developed rapidly in the world as well as in China. The number of international tourist arrivals increases continuously, while the number of domestic tourist arrivals increases even more rapidly for the living standard at home improves also rapidly. Ecological tourism is developed with the objective to increase the pure income of local residents, and to raise the awareness on protection of environment through education.

The dimension and types of ecological tourism should be strictly controlled within the capacity of scenic areas and cultural facilities. The wildlife should be prevented from human disturbance, the natural environment should be protected and the native culture should be respected.

To promote the small scale tourism enterprises with little disturbance run by local communities will ensure most part of revenue be left in local place and strengthen the protection of the property.

In order that above principles be put into effect, all plannings on tourism development shall be approved by the Office for application for World Heritage of Jiangxi Province.

Increase the number of scenic spots to meet needs from a increasing tourism market and to lower the pressure from the increasing visitors number. The nominated property should work out a general plan on the management of tourism to control the extremely rapid increasing tourist facilities and draw up a standard of tourism development for scenic areas within the property.

(I) Management on tourism projects

- Tourism projects should be in accordance with the character and the general plan on Mount Sanqingshan National park.
- Tourism projects should comply with requirements of relevant laws and regulations.
- Tourism projects should be in conformity with requirements of projects management in both National Park and National Geopark.
- Strictly control the number of sites of tourism projects to meet the requirements of detailed planning.
- Development of tourism projects shall not damage scenic areas that are ecologically and culturally sustainable.

(II) Management on visitors' security

- The national park implements the management of tour activity in scenic areas in accordance with classification and capacity.
- The national park improves marks for tour routes and scenic areas, and marks pointing tourist activities.
- Visitor's activity in the park should comply with regulations on management of travel. Activities contra-

dicting to local customary activity are prohibited.

- Administrative Committee of the National Park shall assure the security of visitors by improving security marks for tourists.
- Establish the monitoring and patrol network for security of the park, and implement all-weather management and safeguarding.
- Perfect the security and rescue system to meet urgent needs, keeping the staff, team, equipment, technology, source in place and responsibilities be assigned.
- The main gate set up at the periphery of the nominated property, and an ecological parking lot built up. Entrance for vehicles not satisfying the waste gas discharge standard is prohibited; while horn sounding also is prohibited. It is planned to use energy-saving, environment friendly and high efficient transport facilities.

3.6.6 Evaluation and Management of Construction Projects

Evaluation and demonstration on feasibility of any project should be done, which includes different tour service and reception facilities, public engineering, enterprises, and team and private projects to be built within the protected zone or buffer zone, and restoration engineering projects within the core zone. Rigorous evaluation will be done on content of project, also on potential harm brought about by project, as well as on benefit of project. It is necessary to establish an evaluation and management system which embraces the examine of project procedure, evaluation of project planning, monitoring of construction and check and acceptance of finished project, and which should be in conformity with state laws and local regulations, and meet the international experience of management (ISO2001 quality-environment-security system).

(I) Content of project evaluation

- Influence on the granite heritage of Mount Sanqingshan and its evolution model
- Influence on natural scenery and landscape of Mount Sanqingshan, including form, arrangement and spatial continuity
- Influence on surface and ground water
- Influence on endemic organisms and vegetations
- Influence on the groups having vested interest and protection framework, in particular the traditional interest of villagers.
- Influence on cultural and customary tradition
- Rigorous evaluation on environment should be done. The rule ‘One can vote down’ will be implemented as the influence on environment is concerned.

(II) Evaluation system of construction project

- Examine of project procedure: Relevant departments examine the format of report submitted by the proposal side, and to check weather the project is in conformity with laws and regulations. Then the project shall go through examine and consultation of groups having vested interest, and be evaluated and demonstrated by experts. The proposed project and comments of demonstration should be published and examined, and finally get feedback.
- Comment and examine of project plan: Plan is announced for public bidding, undergoes evaluation, then is subjected to examine done by executive and juristic departments.
- Construction monitoring: Construction is announced for public bidding. Consumption of construction

material, advance of construction and quality should be put under control.

- Check and accept of finished project: weather, the standard of techniques, environment, landscape and security are reached.

3.6.7 Scientific Research and Monitoring

At present, a monitoring system has been set up and brought into use. Forestry Administration, Administration on Land and Resources and Administration on Environmental Protection of Jiangxi Province also play to set up a monitoring station to do monitoring work on indicators in ecology, geological research and environment. The protection monitoring system designed in the planning is to be expanded to set up a network between all research institutes, which is to be used to integrate the collected information and to supplement the information uncovered by the existing monitoring system in angle of geological location and technology. Supplementary monitoring is to be done by staff at the nominated property, on whom relevant training is to be conducted beforehand. Scientists and staff at the science committee of the site will provide technical support for the training. Digital database is to be set up at units in the nominated property, and a management system based on GIS is also to be set up.

Monitoring project is composed of several parts. It is crucial to obtain correct and reliable baseline investigation data for quite a lot of items at the very beginning.

(I) Protection monitoring indicator system

Relevant monitoring indicator systems on heritage management should be set up based on heritage type and protection condition of the nominated property (Table 3.2).

Table 3.2 Monitoring indicator of the condition of the nominated property

| Surveillance indicator | Cycle | Department storing the materials |
|--|---------------|--|
| Completeness(classification, boundary and type) | year | Jiangxi Provincial Department of Construction, Management Committee of Mount Sanqingshan National Park |
| Quantity and soundness | year | Management Committee of Mount Sanqingshan National Park |
| Types and quantity of plantation and plants | year | Management Committee of Mount Sanqingshan National Park, Shangrao Forestry Science Institute |
| Types and quantity of animals | 5 years | Wildlife Conservation Bureau of Jiangxi Province |
| Alien species and its dangers | Non-scheduled | Jiangxi Province, Department of Forestry; Shangrao Municipal Bureau of Forestry |
| Environment quality indicators in atmosphere, water body and noise, etc. | year | Shangrao Environmental Protection Bureau |
| Hydrologic regime and water quality | year | Shangrao Water Conservancy Bureau, Shangrao Environmental Protection Bureau |
| Village number and population within buffer zone | year | Management Committee of Mount Sanqingshan National Park, Bureau of Land and Resources, Shangrao |

Continued table 3.2 Monitoring indicator of the condition of the nominated property

| Surveillance indicator | Cycle | Department storing the materials |
|--|---------|--|
| Cultivated area within buffer zone | year | Shangrao Bureau of Land and Resources |
| Sightseeing and recreational activities in the scenic zone | year | Management Committee of Mount Sanqingshan National Park, Shangrao Tourism Bureau |
| Tourist and sightseeing program | year | Management Committee of Mount Sanqingshan National Park |
| Natural disaster | year | Department of Land and Resources Jiangxi Province |
| Impact of community development projects on nominated property | 5 years | Management Committee of Mount Sanqingshan National Park |
| Change in type of land exploitation | 5 years | Management Committee of Mount Sanqingshan National Park, Shangrao Bureau of Land and Resources |
| Forest fire | year | Management Committee of Mount Sanqingshan National Park, Shangrao Forestry Bureau |

(II) Administrative units responsible for the protection monitoring job

Different monitoring objectives have been summarized in the following table (including baseline data collection), and responsible units are recommended according to all objectives(Table 3.3).

Table 3.3 Units responsible for administrative monitoring the heritage of the nominated property

| Surveillance organisation | Tel. | Address | Zip code |
|---|------------------|------------------------------|----------|
| Management Committee of Mount Sanqingshan National Park | +86-793-8225817 | 8 Xinyang Road, Shangrao | 334000 |
| Shangrao Construction Bureau | +86-0793-8223196 | 42 Gandongbei Road, Shangrao | 334000 |
| Shangrao Environmental Protection Bureau | +86-0793-8316268 | 16 Gandongbei Road, Shangrao | 334000 |
| Shangrao Water Conservancy Bureau | +86-0793-8307112 | 116 Wusan Avenue, Shangrao | 334000 |
| Shangrao Bureau of Land and Resources | +86-0793-8261366 | 10 Daihu Road, Shangrao | 334000 |
| Shangrao Forestry Bureau | +86-0793-8293631 | 69 Shengli Road, Shangrao | 334000 |
| Shangrao Meteorological Observatory | +86-0793-8293768 | 1 Douya Lane, Shangrao | 334000 |
| Animal and Plant Quarantine Institute of Shangrao | +86-0793-8293631 | 69 Shengli Road, Shangrao | 334000 |
| Shangrao Tourism Bureau | +86-0793-8220290 | Zhongshan Road, Shangrao | 334000 |

(III) Other relevant protection monitoring indicators

Protection monitoring on granite geology and landform remains quantity, distribution and natural landscape

Ecological process and biodiversity indicators plantation monitoring, animal monitoring, changes in plant and animal types and cave animal types, and monitoring on denizen (or invading species).

Environment indicators monitoring on weather change, air quality, noise and environment sanitation.

Monitoring on land exploitation monitoring on land use as farm land and for construction use, water body, forest felling, afforestation and transport, etc.

Management on tourists monitoring on tourist number, sightseeing program, coverage of scenic spots as well as on tourism service facilities and quality.

Monitoring on natural disasters monitoring on meteorological disaster, fire accidents, drought and flooding, and on mud rock flow, etc.

(IV) Administrative arrangement for heritage monitoring

Administrative system of the management and surveillance work(Fig.3.3, 3.4)

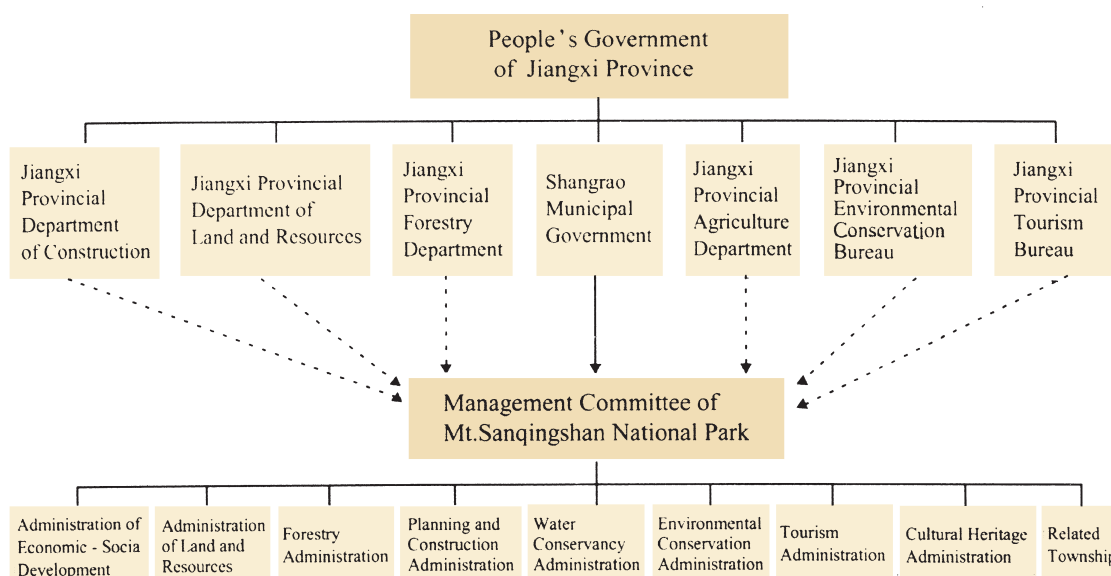


Fig.3.3 Block diagram of administrative system of the management and monitoring work

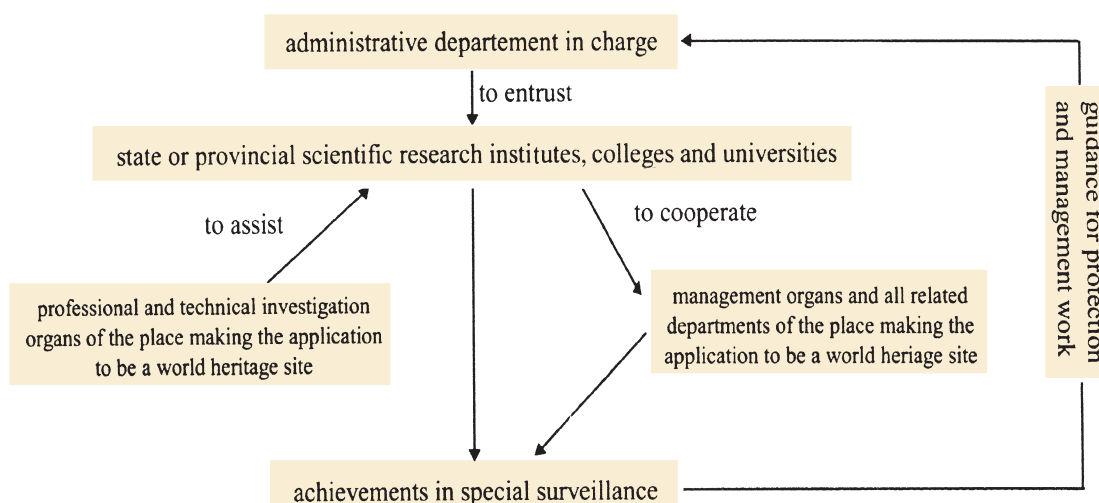


Fig.3.4 Block diagram of scientific and technological monitoring system

(V) Scientific research and establishment of monitoring network

Scientific research

Research program includes several fields and many sub projects, which supposedly to be carried out by different institutions, research institutes and universities. It should include a series of projects at level of international cooperation.

Research works that enable to improve the work concerning management and conservation should be encouraged, including following themes:

- Build GIS database by collecting remote sensing data and data from field monitoring and investigation, and monitor the change of vegetation;
- Continue to study ecology of the rare wildlife and plants;
- Continue to investigate the area that wasn't studied and the scarce biotic community;
- Method to restore the habitat for wildlife;
- Study of the environmental background of the property;
- Research on networked dynamic management of the landscape and ecology of the property;
- Planting of herbal plant and its processing techniques;
- Socio-economic study.

All application forms having above mentioned subjects shall be submitted to local relevant administrative departments, at the same time applicant makes a copy for the Office of management on application for World Heritage of Jiangxi Province, and to be coordinated by the Office. An agreement between administrative department and applicant will be signed on each study, which describes the character of the study, decides the ownership of intellectual right the result yielded, where specimen and duplicates to be positioned, notifies regulations the written report and publication concerned with, and requirements to referring to literature etc. The terms to be provided to partners should be noted in the agreement, such as accommodation, transport facilities, translation, maps and other data and materials needed. Administrative organ of the property may be paid the relevant cost based on the capacity of assistance it provided. All foreign scientists shall be accompanied by chinese colleagues from relevant organizations; the corresponding expenses born shall be covered by themselves.

Construction of monitoring network

- Arrangement of monitoring: Dynamics of granite, biodiversity, atmosphere, water quality, hydrology, visitors are to be under the monitoring network.
- 3S monitoring database (GIS, Remote Sensing, Global Allocation System).
- Monitoring unit and staff: Monitoring unit and staff at levels of province, city, county, country and village.
- Monitoring and evaluation system: Regular and irregular analysis of monitoring indicators shall be done, and yielded information will be announced.
- Monitoring and supervising: Monitoring action shall accept a supervise and monitoring result shall be checked, re- analyzed and evaluated.

3.6.8 Propaganda, Education and Training on Protection

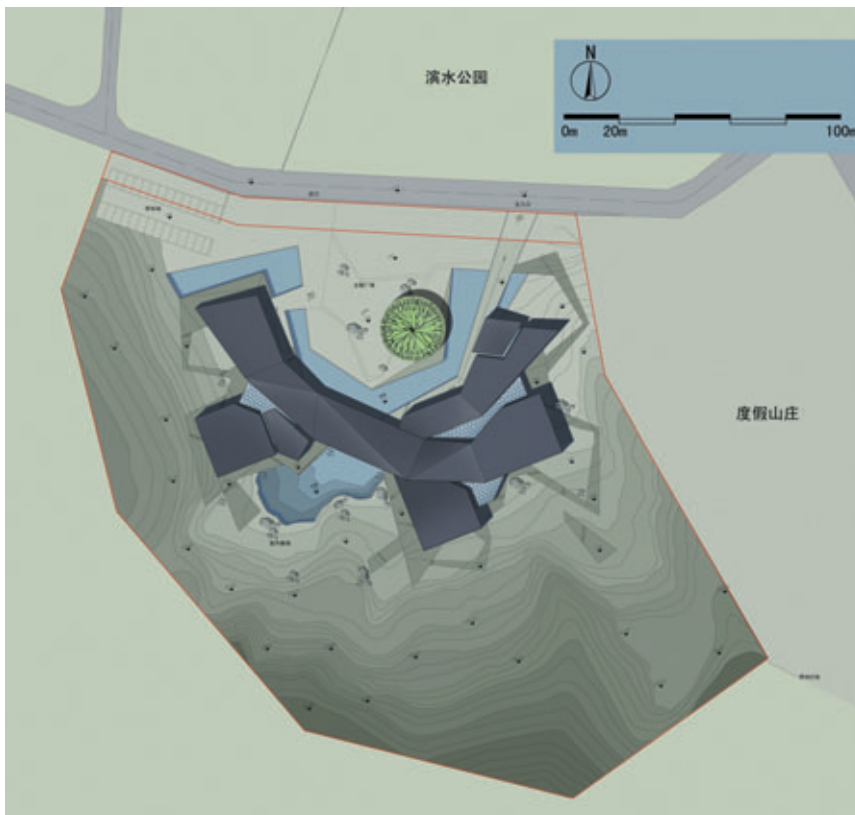
(I) Propaganda on Protection

A comprehensive publicity and education project is to be done by focusing on the following three groups:

- Schools of local towns and villages
- Communities within the protection zone
- Visitors and tourists

With cooperation with the administrative departments in charge, a series of information and material processing centers are set up, and a museum and a tourist service center are to be constructed. In addition, maps are to be made, exhibitions to be held, and brochures and other relevant materials are to be printed and distributed (Fig.3.5,3.6).

Special courses are to be set up at local schools. School-age children are to be educated about importance of function preservation for the nominated property, about knowledge on fire prevention and bio-diversity condition of the site. The courses are set to inspire love and pride in the children for the local nature and



tradition; meanwhile, it is proved by real cases that local economy can be improved through elaborate protection and eco-tourism development. Students should be organized for excursion to experience the gorgeous scenery and wildlife around them.

With remote services, some special publicity materials on importance of forest restoration, encroaching controlling, waste treatment, basin area protection and of biodiversity are to be sent to villages and families at remote area in the nominated property. Besides, instructive posters and vigorously taken measures are to be adopted to develop more sustainable and new life styles, which are to be reflected in the work of protection, monitoring, research, tourism development and in other initiative measures.

Fig. 3.5 Sanqingshan Museum



Fig. 3.6 Tourist Centre of Mt Sanqingshan

(II) Training on protection and management work

Target and task

Through introducing new theories, new information, new technology and new methods of world heritage, to unified protect and monitor the quality standard and method under GIS management, to update knowledge, to upgrade scientific and technological level, to develop domestic and international academic exchange on world heritage management, and to cultivate high-quality technical cadre men on heritage management.

Basic contents

- Elementary knowledge background on heritage resource management, Convention Concerning the Protection of the World Cultural and Natural Heritage from UNESCO, Ordinance on World Heritage Protection of Jiangxi Province, and relevant laws and regulations from the state and local government, and an outline on World heritage.
- Management technique GIS application, quality criteria and methods on protection and monitoring, methods for compiling a report on regular monitoring of world heritage.
- Domestic and overseas academic exchange on world heritage management.

Organization highlights

- Office for World Heritage Management of Jiangxi Province organizes and sets up the Training Center on World Heritage Management of Jiangxi Province.
- To organize experts to compile teaching materials and give lectures, and to invite experts from UNESCO

and those from relevant international organizations to give lectures.

- To encourage personnel engaged in heritage management work to go for high-level advanced study and to go to study for higher educational level.
- During the plan of Training program on World Heritage of Jiangxi Province between 2006 and 2010, all management staff, an amount of 100-300 people, have been through 1-2 training programs.

3.6.9 Sustainable Development of the Community

Farming activities of communities at the nominated property will be further restricted as a result of the demand for protection and management on the site, which in turn, leads to the impact on its economic life. However, it is a long-term efficient work to work out a vigorous community economic development strategy with sustainable development but not at the cost of environment destruction. Community development project includes the following contents:

Environmental projects at small cities and towns Such public utilities and common service facilities as drainage, and daily waste treatment facilities, and domestic water supply devices are to be installed and perfected in the cities and towns where residents gather in the nominated property.

To optimize fuel structure Community residents are encouraged to use electricity power instead of fire-wood and coal.

To encourage communities to participate in the heritage protection and ecological tourism employment Community residents are encouraged to participate in the work of tour inspection on wild animals and forest fire prevention, ecological construction and ecological tourism employment.

Demonstration and spread of artificial planting and processing of plants for medical use and flowers in the communities.

3.6.10 Management Organ, Management and Training of Personnel (partnership included)

(I) Management organ

- Improvement of management organ and monitoring system of Mount Sanqingshan National Park should be in accordance with law and regulation.
- Improve the operational mechanism of Administrative Committee of Mount Sanqingshan National Park, Yushan County Government, Dexing Municipal Government, and countries and towns within the buffer zone in respect to responsibility of management, and strengthen the system of responsibility.
- Departments under Administrative Committee of Mount Sanqingshan National Park are set up in accordance with function: Management type, Conservation and monitoring, management of public affairs, audit supervision, and built up a conservation team of resources and environment, responsible for patrol, monitoring and investigation and deal with accordingly within the area of 22,950 ha, as resources and environment concerned.
- Establish and strengthen an effective team on technical consultation and improve the support system

composed of trade associations, academic societies, research institutions and other technical experts (international professional and non-governmental organizations included).

- Establish and strengthen the consultation mechanism between government, the administrative committee, local community, enterprises (investors) and local residents, and improve the participation mechanism of groups having vested interest in affairs of Mount Sanqingshan National Park.

- Improve the resource conservation network at 4 levels: the administrative committee, country (town), village committee and villagers' group, and strengthen the coordination mechanism between the monitoring patrol of Sanqingshan and the forest patrol network.

(II) Management and training of personnel

- In accordance with requirements of Mount Sanqingshan National Park on professional contingent of management improve the staff structure and facilities allocated. Personnel in a specific field shall take 70 % of on-duty staff of the Administrative Committee.

- Clarify the requirements to responsibility, post allocated and norm to be done of personnel, realize the total management of post, responsibility, assignment and quality.

- Implement the rule of post management: Only holder of a certificate is allowed to be employed; training before being employed, and at -post examine.

- Establish and improve the regulation of at-post training and out of post training and continuously raise the quality of the personnel.

- Compile the training materials and textbooks satisfying the requirements of the conservation, development and management of Mount Sanqingshan National park.

- Draw up the regulation on post responsibility for the management personnel of conservation network at 4 levels and realize the principle 'divide up the work and assign a part to each'.

- Management personnel who keep watching on the resources within the patrol area is authorized to keep watching; any approval of usage doesn't come within their jurisdiction.

- Monitoring personnel shall make regular report on the dynamic regional resources, summarize and exchange the experience regularly.

- Implement the training program once a year on legal and professional knowledge for the management personnel of the conservation network at 4 levels.

- Professional personnel shall participate in the legal training each year organized by the juristic departments of province, city and county.

3.6.11 Management and Allocation of Resources

The conservation program of the nominated property (2005~2010) includes 4 projects, based on estimation the total investment reaches 169 million Yuan (Table 3.4).

(I) Fund raising

- The investment of the state sums 101. 40 million Yuan, i.e. 60% of the total investment, which covers special funds for the project of conservation of natural forest, the project of reforestation of some cultivated land in line with the local conditions, the ecological relocation project, and the fund for the project of conservation and construction.

Table 3.4 Estimation of investment for conservation and construction of the nominated property
(2005~2010)

(unit: million Yuan)

| Project | Subproject | Capacity | Investment |
|--|---|--|------------|
| Conservation of granite geosite of the property | Conservation facility for key geologic heritage, Conservation mark and sign | | 3.00 |
| Conservation of wildlife and plant | Conservation of key endangered animal and plant, restoration of habitat, corridor, construction of a ground to free captives. | | 3.00 |
| Comprehensive renovation and ecological construction | Preparation | | 1.00 |
| | Renovation of quarry and factory | | 5.00 |
| | Slope land to be reforested | Restoration of 750ha of slope land | 3.00 |
| | Ecologic restoration of the property | | 10.00 |
| | Eliminate result of geologic hazards | Restoration of vegetation on the side of 26 km highway | 5.00 |
| | Renovation of tourism facilities | 10000m ² | 20.00 |
| | Ecological relocation | 1200people (265 households) | 12.00 |
| | Subtotal | | 56.00 |
| Construction of management facilities | Highway building | Grade III, 20 km | 10.00 |
| | Power supply and communication | | 20.00 |
| | Construction (monitoring equipment) | 2000m ² | 4.00 |
| | Field monitoring station and network construction | | 12.00 |
| | Exhibition facility, promotion and education | Museum and tourist center | 45.00 |
| | Management training | 100-300 people once | 6.00 |
| | Community construction | | 5.00 |
| | Subtotal | | 72.00 |
| Research work on protection and preservation of property | | | 5.00 |
| Total | | | 16900 |

- The investment of Jiangxi Province 33.8 million Yuan takes 20%.
- The city, county and the Administrative Committee have invested 33.8 million Yuan, taking 20%.
- Fund for management and conservation is collected from the revenue of ticket sale and tour service

based on fixed proportion, which will become the main source of the management fund.

(II) Management resources and allocation

The management resources of Mount Sanqingshan National Park includes: professional contingent, fund, equipments, information, land etc.

- In accordance with the dimension of conservation in the park, the land ownership and the management responsibility, the management resources are used in realizing the principle ‘government coordinating, the administrative committee organizing and trade department monitoring’
- Management resources are mainly used by the administrative committee, partly allocated to country and villages.
- Management resources are spent to the conservation, monitoring, reconstruction and restoration, personnel, promotion and education, training and exhibition.
- Development projects and resources input should be strictly managed. Implement the fund and resources monitoring and strengthen the self-controlling ability of the Administrative Committee.
- Usage of the management resources should be examined and verified annually, the usage of the resources and the efficiency evaluation are announced each year.

3.7 Construction of Management Database

3.7.1 Contents of the Database

- Basic data on granite: type, coordinates and geographic location, significance, physiographic feature, human activity (land use included), conservation measure and state of development
- Basic data on geologic remains: type, location, scientific significance, geographic feature, human activity (land use included), conservation measure and state of development
- Basic data on biodiversity: vegetation type and distribution, list, album and distribution of animal and plant, list, album and distribution of rare and endangered animals and plants, list, album and distribution of ancient trees, distribution and state of existence of top community and endemic plant community, archive of afforested plants (species, original source, place the plant settled, cultivating measure, growth trending), archives of endemic afforested plants in Sanqingshan area (species, characters, measures of collecting and breeding, state of conservation)
- Basic data on hydrology and water resource: registration of water bodies (surface river, lake, reservoir, spring, canal (name, location, state of water, condition of storage), record on state of water existence (change in history, physiographic situation, human activity, development and usage, conservation measures). Registration of controlled water bodies (both water body used for daily life and water body for industry in scenic areas, their distribution, water quality, treatment and flowage), data of drainage system in scenic areas (surface and ground water systems, their name, distribution, source, state of water, catchment area, natural landscape and human activity), data of hydrologic monitoring (location, content of monitoring)
- Data on meteorology: meteorological record and record of meteorological hazards
- Data on humane geography: distribution of population, villages (name, location, history, population, natural condition), economic activity and income, environmental condition to live in (communication, buildings, water source, infrastructure, energy)

- Basic data on land use: type of use, quantity, spatial distribution, owner and ownership, land quality, state of soil erosion)
- Basic data on Administrative Committee: personnel, building, property, finance, investment and business
- Basic data on tourism: quantity, structure, spatial distribution, time flowage, consumption, travel mode and choose, tour guide, visitor reception facilities, facilities for tourist entertainment
- Basic data on scientific research and monitoring: theme and source, result (paper, monograph, proceedings, report, planning, proposal), data of monitoring and analysis, team members and organization
- Basic maps: topographic map, geologic map, map of geological environment, aerophotograph and satellite imagery, map of land use, vegetation distribution map, population distribution map, map of drainage system, map of granite distribution in Mount Sanqingshan, map of key resources distribution, map of rare and endangered plants and ancient trees distribution

3.7.2 Techniques and Types of Database

- Archive storehouse for scripts and maps: collected and stored in accordance with classification available script and map materials (book)and data bodies (Table 3.5).
- GIS techniques (Web GIS included), remote sensing techniques (RS) and GPS techniques
- Build up Management Information System based on 3S techniques, functioned to undertake the dynamic management, inquiry, renovation in proper time, and making analysis and evaluation

Table 3.5 Results from the monitoring of the heritage of the nominated property

| Name | Content | Done by | Publisher or storage place of the materials |
|--|---|---|--|
| Scenery photography album | Geology, landform and human culture landscape | Wang Xiaofeng | Management Committee of Mount Sanqingshan National Park |
| Comprehensive Investigation Report on Mount Sanqingshan National granite Peak Forest Geopark of Jiangxi Province | Comprising: a comprehensive investigation and assessment of the geological background and characteristics of the main geological remains of the nominated property, evaluation on scientific value and aesthetic value of the granite geology, a study on the conditions and processes of landform evolution, comparative study and assessment of the Sanqingshan landscape with other world property, the compilation of a map of micro-landform landscape distribution; discussion on the ways of protection and utilization. | Liu Xiyuan Ma Zhenxin Yin Guosheng Yang Yongge Zhang Yongzhong, etc. | Jiangxi Provincial Geology Survey |
| Investigations of Mount Sanqingshan forest resources | Having made an overall record of rare and endangered plants, including each plant's distribution pattern and biological chain, as well as the characteristics of the biological chain at the nominated property, and the influence from pests on plantations | Jiangxi Provincial Forestry Investigation and Design Academy | Jiangxi Provincial Forestry Investigation and Design Institute |

Continued table 3.5 Results from the monitoring of the heritage of the nominated property

| Name | Content | Done by | Publisher or storage place of the materials |
|--|---|--|---|
| Report on Current Situation of Eco-environment of Mount Sanqingshan National Park | Having completed a comprehensive investigation and assessment on climate, land exploitation, natural disaster, plantation, biodiversity, the aquatic environment, the energy structure at the rural area, and trend of disease and insect damage on forest and crops, which indicates a sound eco-environment in the nominated property | Shangrao Environmental Protection Bureau | Shangrao Environmental Protection Bureau |
| Report on Investigation and Assessment of Resources at Mount Sanqingshan National Park | Having done a comprehensive and systematic investigation of the resources, including analysis of current resources, comprehensive evaluation and aesthetic study of landscape resources, compiled a landscape distribution map, and explored measures and plans in nursing and using plantation. | Jiangxi Provincial Urban and City Planning Institute | Management Committee of Mount Sanqingshan National Park |

4 Protection and Management Project and Items

Among projects listed as the following, some are under planning and some under construction, all of which are done by corresponding departments. Our target is to coordinate projects undertaken within the nominated property, and make efforts to achieve our common objective so as to gain maximum benefit and avoid repeated work.

4.1 Construction Project of Granite Geology Remains Protection

Administration on Land and Resources of Jiangxi Province takes the lead in its planning, including the following contents:

- To install signs on protection work;
- To install safeguard fences at key scenic spots;
- To strengthen popularization and education on geology knowledge;
- To do protection work on environment where the geology remains are located.

With satellite remote sensing pictures and field survey, key granite geological sites are to be located and protection facilities are to be erected. Dynamic monitoring is to be done on key remains, for which, protection signs and marks are to be installed. Environmental protection on geological sites is to be strengthened, and work is to be done to avoid the destruction of geological remains as a result of mud-rock flow and landslides caused by natural or human factors. Protection and management system is to be set up to do legal and efficient protection work.

4.2 Construction Project of Wildlife Protection

Administration on Forestry of Jiangxi Province takes the lead in the job, including the following contents:

- To perfect and extend protection zone in the nominated property, and strengthen management capacity;
- To focus on the protection of endangered wildlife;
- To restore habitats and channels of wild animals.

With satellite remote sensing pictures and field survey, channels of wild animal are to be located and efforts are to be made to restore the channels cut off because of human factors. Protective measures should be vigorously taken at the places where the channels have been encroached as a result of tree felling or agricultural activities, by taking such measures as planting high shade density tree species to form an understorey. Natural plantation at the nominated property and buffer zone should be restored as soon as possible, and forest whose trees have been fallen should also be restored; denizen possibly settling at the local natural plantation should be got rid of. Vigorous move should be taken to protect wildlife habitat and to avoid mud-rock flow or landslides caused by natural or human factors.

4.3 Comprehensive Environment Control and Ecological Construction Projects

4.3.1 Project Target

Comprehensive environment control and ecological construction projects are planned to be practiced at the nominated property to solve problems of mining and slope farming within the site, as well as tourist facilities and highway construction which have affected or spoiled completeness of heritage value. The projects are done in the hope of eliminating direct threat from economic activities to the world heritage nominated property and recovering its eco-environment, by closing down and dismantling quarries, tourist facilities within the core zone affecting heritage protection, by returning land for farming to forestry or returning land for herding to forestry, and by doing ecological recovery on highway section and controlling upland disasters.

4.3.2 Project Contents

Subitem of harnessing quarries To close down quarries and relevant stone material processing factories within the nominated property and the buffer zone. The project is expected to be done in stages between 2005 and 2008. Existing barren rocks in open air at the quarries should be cleaned up in accordance with the demand of controlling project planning so as to restore eco-environment of the site.

Subitem of returning land for farming to forestry Returning land for farming to forestry for the farming land on steep slopes (with an angle of over 25°) is the supporting ecological project of 'Protection Project of Natural Forest' implemented by the state and Jiangxi Provincial Government.

Subitem of tourist facilities control Existing tourist reception facilities penetrating into the core zone of the nominated property should be gradually removed. The controlling project is expected to be done in stages by 2010. Tourist reception scale at Tiyun Range Reception Station is to be reduced to 400 beds.

Ecological restoration at quarries, sites remained with tree felling and sites with tourist facilities construction trace To close down the quarries and relocate the tourist facilities, and restore plantation as soon as possible. To go on with the work of tree planting and afforestation at the sites where trees have been fallen, and chosen tree species should be an analogy of the local plantation form; seedling nursery of local plantation form is to be set up, in which, denizen is avoided. Foreign species introduced into the protection zone should be gradually changed to local species, and replaced by the locals at last.

Control of geologic hazard Landslides and mud-rock flow occur at all scenic areas within the nominated property, most of which have been promptly brought under control. Focus of the item is a demonstration project of controlling mud-rock flow on around-mountain highways.

Resident relocation for ecological good Given the increase in local resident population and in tourists,

it is proposed in the planning that all residents at the core area and 1/5 of residents at protection zone of the nominated property are to be moved to area outside the nominated property for relocation. It is a policy and should be done by following existing policy on the relocation work of the state, and implemented under the unified planning and organization of the local government.

4.4 Construction Project of Management Capacity

4.4.1 Management on Infrastructures

Highway In order to upgrade management capacity for heritage security and adapt to the demand for tourism development, existing subhighways within the nominated property should be renovated by the standard of Grade III and Grade IV highways, in compliance with the need and finance resources for nominated property management. Total mileage of the Grade III highways to be constructed reaches 20km.

Power supply Power supply for the place where Management Committee on Mount Sanqingshan National Park is located has been done through provincial or local electric network. By saying power supply in the planning, it refers to the extended power supply in the core zone of the heritage site to satisfy the monitoring need. In addition, to realize fuel structure optimization at the nominated property and the buffer zone, local government is asked to enlarge its power supply capability to the protection zone.

Communication Digital telephone transmitted in fiber cable and wireless telephone have been popularized in the nominated property. The planning only requires to protect necessary communication devices for the need of monitoring job.

Construction It covers Management Committee on Mount Sanqingshan National Park and monitoring stations. Currently, the Committee is equipped with basic living and working conditions. According to the planning, 6 monitoring stations are to be constructed, covering a total area of 1200m².

4.4.2 Field Monitoring Facilities

It includes:

- 4 meteorological observatories (or local networks);
- 3 hydrographic stations (or local networks);
- 10-20 pieces of permanent standard ecological sample area;
- 4-6 observatories for wild animals and fire prevention .

4.4.3 Technological System

It includes:

- GIS supporting equipment at the Management Committee of the nominated property;
- Equipment for meteorological and hydrographic observation at the 6 monitoring stations;

- Equipment for field tour inspection(such as GPS, etc.) at 6 monitoring stations;
- Equipment equipped for laboratories at the 6 monitoring stations;
- Communication devices and transport facilities and their upgrading at the 6 monitoring stations;
- GIS and supporting equipment at the network center .

5. Management Plan on Mount Sanqingshan National Park in Different Zones and Different Classes

Management of Mount Sanqingshan National Park includes the core zone, protected zone and buffer zone. The park itself comprises the core zone and protected zone, identical to the nominated property.

5.1 Management Plan on the Core Zone

5.1.1 Intension and Extent

The core zone embraces the natural heritage of granite geology and landform, rare in the world, the disjunctive sliced distributed plant population, represented by the rare species *Pseudotsuga gaussenii*, the granite peak forest landscape mainly composed of granite microlandforms such as peak pillars and pictographic stones, the site of concentrated biodiversity and site producing type specimen of important species, and preserves relatively complete primeval ecosystem and natural landscape.

With area of 3,780 ha, the core zone includes the ecological protected area of the park, historic relics protected area, natural landscape protected area, geologic remains protected area, and landscape sightseeing area.

5.1.2 Requirement for Management

- On legal and regulatory basis readjust the land ownership to guarantee the implementation of effective and workable management on the property of Mount Sanqingshan National Park.
- Combining the legal, regulatory protection with the traditional customary protection to strictly maintain the natural station, implement a strict closed protection, conserve the natural evolution trend of granite, hydrology, soil, flora, relief and landform.
- By heart conserve granite geological remains, maintain the coexisting natural station of granite diversity and biodiversity in Sanqingshan.
- Quarrying and felling are prohibited, and fire should be prevented properly.
- For man planted forest the primeval seeds of trees are used, and carry out the breeding that benefits the evolution of plant directed to formation of top plant community.
- Hunting is forbidden. The discharge of waste water not processed or not reaching the standard into brooks is prohibited.
- The entry should be strictly controlled and there is no entry for the motor driven vehicles and livestock driven cart.
- Strictly protect the granite geomorphic landscape, of which any relief and landform are forbidden to change and damage, except for the footpath and tourist facilities necessary for sightseeing.
- Different kinds of facilities are used only to ease visitors to savor the landscape of spectacular granite

peak forest, which should not be like ‘a noisy guest steals the host’s thunder’, disturbing the natural scene.

- Facilities unrelated to natural beauty and structures for lodging accommodation are not allowed to construct.

5.2 Management Plan on Protected Zone

5.2.1 Intension and Extent

The protected zone functions as a screen to protect the landscape of granite peak forest, geologic remains, bio- community and natural scenery in the core zone against the possible disturbance from human activities, and to protect the integrity of natural scenery and aesthetic landscape in the core zone and the integrity and continuity of the hydrologic system of granite and the providing area of the water resources; at the same time to protect the important geologic remains of granite and its evolutionary history, and other important landscape and aesthetic value related to granite evolution out of the core zone.

The protected zone is a part of the nominated property out of the core zone, an area for controlled construction of the national park with area of 19,170 ha.

5.2.2 Requirements for Management of Protected Zone

- Strengthen the landscape engineering with endemic trees planting set on the existing highways, railroads and other communication facilities.
- Strictly control the expansion of villages and residential area and instruct local residents to maintain traditional style, layout and color of buildings.
- Architectural structures shall be in conformity with characteristics of the nature and human history in Sanqingshan; reception facilities for tour service shall be in line with the nature of Mount Sanqingshan National Park to escape the phenomenon of ‘a noisy guest steals the host’s thunder’.
- Restore landscape and ecology at the quit remains by human activities in accordance with the Plan.
- Carry out a limited reforestation of the cultivated land around the water source site.
- Forbid any activity that causes a damage to landscape, environment, geologic remains, water source and endemic plant community and prevent fir disaster properly.
- Fasten the construction of village’s infrastructure, improve the sanitary condition and prevent the daily life pollution.

5.3 Management Plan on the Buffer Zone

5.3.1 Intension and Extent

The buffer zone functions as to buffer the influence of human activity on the National Park, to protect the important endemic plant community, the catchment area and important cultural landscape out of the core zone and protected zone, and to guarantee the integrity of granite and its evolution remains.

Buffer zone is the surrounding protective zone of Mount Sanqingshan National Park, taking area of 16850 ha.

5.3.2 Requirements for Protection

- Strengthen the landscape engineering and environment construction, gradually improve the energy structure of household and limit the usage of chemical matter (chemical fertilizer and pesticide).
- Speed the promotion of science and feasible technology, promote the traditional concepts and techniques of local residents in protection of endemic organisms and water source. Readjust the structure of cultivation and rearing, develop local special agriculture and forestry, and restore and build the rural landscape.

5.4 Classified Protection and Management

5.4.1 Protection for Granite geologic landscape and geologic remains of Sanqingshan

The granite geologic landscape refers to the different types of granite scenery, while the geologic remain refers to the relics representing the major events in the earth's history, including the granite evolution history, i.e. the relics on stratigraphy, fossils, geologic structure and hydrology etc. They represent the substantial landscape and scientific significance of the Mount Sanqingshan National Park, and should be put under the strict protective management.

- Strictly forbid quarrying and earth collecting, and implement the rigorous measures against fire disaster.
- Any organs and any person are not allowed to pick or remove the granite out of the park.
- The geologic landscapes and geologic remains to be protected in the park will be announced in form of catalogue, planning, measures, perspective design to protect and restore granite landscape, and be exhibited with remarkable signs.

5.4.2 Protective Management of Taoism Culture Landscape and Ecological Plant Landscape

Taoism culture landscape refers to the Taoism activity and Taoism relics; while ecological plant community refers to different types of plant communities which fit to the habitat character of Sanqingshan, including ancient trees community. Requirement for protective management:

- Announce the distribution of Taoism culture landscape and Taoism relics, mark the significance and implement the protective measures.
- Announce the list and album of the ancient trees community in the park.
- Compile and announce the plan and measures for protection and restoration of Taoism culture landscape and ecological plant community, and exhibit the perspective design.

5.4.3 Restoration and Protection of Landscape Along the Tourist Highways

The landscape facing the mountain is an important window to look into the park. The requirement for

protection and restoration:

- Undertake the restoration of landscape and ecology in the facing mountain area alongside roads getting through the park, do what is suitable to the environment and realize the natural arrangement.
- As the land alongside the road is state owned, it is possible to build storehouse for species protection and diffusion to localize the landscape, while the approach for urban road landscape is not feasible.
- For different accesses within the sightseeing area the environment friendly means of transport and pave material for road are to be used.
- Mark important landscapes and plant names along the lines.

5.4.4 Construction at Entrance of the Park and Landscape Protection

Mount Sanqingshan national Park has tree main Entrances: Jinsha, Fenshui and Waishuangxi. All of them are the window of the park and the image sign of the park. The requirement for their protective management as follows:

- Mark the landscape features of themselves, scientific significance and tour routes.
- Strengthen the protection for the natural landscape and environment, maintain the natural scenery, stress on the protection for natural and cultural features of each scenic area.
- Maintain or create a good environmental atmosphere specified for each scenic area.
- Parking lot, service facilities, structure and building constructed shall not damage the natural scenery and landscape environment.

5.4.5 Construction of Villages and Tour Service Bases

It refers the residential area, tour service and visitor reception area, vacationing resort etc. Requirement for construction:

- Maintain local special features of the residences.
- It is prohibited to dig and destroy in a large scale the original relief and landform of the villages, protect the village's structure and maintain the natural evolution trend.
- Strengthen the greening of buildings and structures.
- Improve the infrastructure condition and sanitary condition, implement the treatment of waste water and garbage.

5.4.6 Control on the Architectural Style in the National Park

(I) Control on the architectural style in sightseeing area

- Building and architectural layout should be controlled as one story, in any case not surpassing two stories.
- Encourage to use the native and local construction material; modern materials such as face brick, glazed tile, mirror glass etc. are rejected.
- Local architectural style is preferred, the slope roof style is encouraged.
- Gray, light gray colors are offered in order that architectures be in harmony with environment.

(II) Control on the Architectural Style in Other Areas

Include construction sites out of sightseeing areas, i.e. the village construction site within the park and the composite tourist service zones.

- Buildings are not to surpass three floors or 14 m in height.
- Encourage to use the native and local construction materials. The modern material such as face brick, glazed tile, mirror glass are not to be used.
- The architectural style required shall have traditional residential features of Northeast Jiangxi, the slope roof style, black tile and gray wall, and stone foundation are encouraged.
- The proportion of greened land should not less 40%.
- The architecture density should not surpass 40%.
- Architecture capacity per cent should not more than 80%.

5.4.7 Control and Management on Greening

The control refers to the supervision on greening in the park, in particular in the core zone and protected zone, including:

- Establish the concept that the greening alongside the road is one of the image marks of Mount Sanqingshan National Park.
- Exhibit the design on restoration of organism communities and the greening plan of Mount Sanqingshan National Park.
- Announce the catalogue, album and planting techniques of endemic plant species that will be used in greening.
- Announce the catalogue, album and the technique to get rid of the alien species.
- Establish the approval mechanism to introduce new species, control harmful species.
- Based on the land ownership and the function fitted, delineate greening sections in accordance with responsibility, establish the leading responsibility of the Administrative Committee and other governments' agencies, encourage community, enterprises, groups and residents to take charge in and be responsible for greening sections.
- Improve the construction of endemic plant growing base of the park.
- Establish the fund for protection and restoration of biodiversity of Mount Sanqingshan National Park.

6. Management Plan on Tour Service Zone of Mount Sanqingshan National Park

6.1 Management Plan on Waishuangxi Visitor Reception Zone

Location: situated along Nanqingxi valley in the south of the park, it is bounded on north by the dam of the water plant, spreading southward to Ludi village, to east and west the zone is limited by contours of 600m and 700m. Within 1.83 km² area of the zone the planned population is 450 people.

Function: the main southern gate of Mount Sanqingshan National Park, also the protective zone of the park and visitor reception zone.

Objective of Plan: To build an attractive and sustainable visitor reception zone, functioned perfectly in tourism service and surrounded by a beautiful landscape.

Requirements on management:

(I) Management measure on tourism

- Perfect the service zone at the gate of the park: Arrange facilities for reception, relaxation and entertainment, keeping fit, and build parking lot, management office, restaurant and shops.
- Management on construction: All construction projects are strictly under control. The size of hotel should be limited. Hotel shall be built in harmony with surrounding landscape and fitting to relief, and not higher than three stories. The Plan on Environmental Protection should be strictly observed.
- Strengthen the tour guide staff and publish guide book

(II) Management of village construction

- The Surrounding area of Dongao-Pingxi is planned to be reconstructed into a tourism village to promote the visitor reception activity ‘Happy Farmer’s Family’.
- Gradually improve environmental sanitary facilities reconstruct the energy source of household.

(III) Landscape breeding

- Strictly protect the landscape resource around the site of construction at the scenic spot. Protect the original relief and landform, not allowing any large-scale reformation of relief and landform; attach an importance to harmony of construction with the surrounding landscape.
- Gradually commandeer the separated farmland in the core zone, which assigned to breed the landscape of endemic plant community and to promote the rural scenery on.
- Build the environment that fits the sightseeing and relaxation activity and plant the scenery forest, economic forest and orchard in the surrounding area of the buffer zone.
- Organize ‘Farmer’s culture garden’ and build the entry gate, bus station, parking lot, square, culture and customs street, walking entrance of scenic zone, all will show the distinctive landscape of Waishuangxi.

(IV) Requirements for environment management

- Architecture design shall attach an importance to relations between the green ecological screens of mountain bodies and lines of vision. It is needed to strictly control the form, volume, dimension, size and color; the architecture is supposedly not higher three stories and the usage of any kind of face bricks is prohibited.
- Miniature artistic creation of landscape shall reflect the local culture, strongly suggested to be built with local materials: rock, bamboo and wood etc. in order to form a local landscape mark.
- The proportion of green space within the boundary should be higher than that out of the boundary. The proportion of green vision and shade density also should be increased, and the man-made trace be decreased.
- Improve the sanitary condition in Dongao Village and adjust the energy structure of the household, at the same time develop the countryside tour and ecological tour.

6.2 Management Plan on Jinsha Relaxation and Visitors Center

Location: The center mainly includes the eastern gate area of Mount Sanqingshan National Park, extending along the valley from Jinsha to Xiken, and occupying 8.67 km². Construction sites are concentrated in the area of 1.62 km², mainly including Jinsha and Xiken. Planned population comprises 800 people.

Function: This is a protective area and also a relaxation and visitor reception zone, which is responsible for conservation of geomorphological landscape, endemic plant community, local culture and cultural relics and water source. Entertainment, relaxation and relaxation-vacationing-ecological tour will be organized.

Objective of plan: It is planned that to the end of the Plan period, Jinsha Relaxation and Visitors center will be built into an attractive, sustainable relaxation and visitor reception zone perfectly functioned for tourist service and with a beautiful surrounding landscape.

Requirement for Conservation and Management:

(I) Conservation of ecology and landscape

- Raise conservation and management measures aiming at the scenic resources within the area respectively (Table 6.1).
- Maintain and protect the natural landscape in surrounding area of Bingyu cave and Yunv Pond.
- Mark Bingyu Cave geologic remain by notifying the type, scientific and ecologic significance.
- Mark endemic plant community and important endemic species.
- Mark the protective boundary between the core zone and the protected zone.
- Strictly prohibit quarrying and hunting and pay attention to prevention of fire.
- Control tree seeds for the landscape engineering, promote the restoration of endemic plant community and plant water source forest.
- Construction of Jinshatan includes the Culture and Custom Street, Relaxation Square, and waterside scenic spot: Beach of Silver Lake, Lakeside Relaxation Belt.
- Backed by road and water body as a corridor, construct six key scenic spots, two waterside landscape axes and landscape road to form the relaxation green space system like ‘a thread piercing pearls’.

Table 6.1 Conservation plan on scenic resources in the planned area

| Protective grade | Spatial extent of construction | Protection requirement |
|----------------------------|--|--|
| Core protected zone | Yulian waterfall, Binyu cave, Yunv Beach, Yeguanyu, and natural forest, worthy of appreciating in the planned area | Necessary footpath and relevant facilities may be set up, construction of unrelated facilities is prohibited, accommodation for lodge not allowed, no entry for motor driven vehicles. |
| General protected zone | The area out of the core zone and developing controlled zone | In need a few temporary ecological lodging facilities may be arranged, construction of unrelated facilities is limited, entry for motor driven vehicles is limited. |
| Developing controlled zone | the area of major construction sites | Construct different tour service and management facilities, strictly control dimension and volume of facilities, construction unit has layout in harmony with environment. |

Note: Conservation requirement for single scenic resource and block shall comply with rules to principle of map splitting

(II) Management plan on tourist activity:

- Visitor Center takes ‘Jinsha (Golden Beach), Bingquan (Ice spring) and Yuandi Valley’ as the main subjects.
- Renovate Jinsha Beach and improve the water landscape.
- Construct a sightseeing cableway of the scenic area at Huangmaogang.
- Build a waterside footpath, landscape and relevant facility at the Yuandi Valley.
- Build facilities for relaxation and picnic.
- Control the number of traffic vehicles, the hiking investigation tour shall be encouraged.
- It is prohibited to leave the garbage freely.
- Construct Yinghuwan ecological village and attached public service facilities: school, kindergarten, culture station, clinic etc.
- Strictly control the quality of water inflowing into brooks, discharge of used water into brooks is prohibited.
- Improve the tour guide system and compile the guidebook.

6.3 Management Plan on Fenshui Tourist Reception Station

Location: The Fenshui area (Fenshui and Xiafenshui included) spreads around the northern gate of Mount Sanqingshan National Park with total area 0.38 km² and permanent population 260 people.

Function: Conservation and Visitor reception station

Objective: Build Fenshui into an attractive visitor reception station with all functions for tourism service and surrounded by a beautiful landscape.

Projects: Reception station featured by the folk customs and cultivation culture.

Requirement for management:

(I) Conservation and management of scientific and ecologic values

- Set up a tablet to mark the boundary between the core zone and the protected zone.
- Closed management of forest vegetation in both the core zone and protected zone
- Collection of seeds of endemic plants is prohibited.
- Planting of alien plants that disturbance the restoration of endemic plant community.
- Strengthen the measures to prevent fire and prohibit hunting

(II) Management of ethnic minority village

- There are villages of ethnic minority such as Egongling, Shibiedi etc.
- Instruct the development and construction of the ethnic minority villages, maintain the traditional style being in harmony with the natural scenery.
- Use the seeds of endemic trees as many as possible for landscape engineering.
- Construction sites for the customary village, the folk customs garden, the culture and custom shopping street, the minority hotel and residents of local people shall not spread toward the core zone and the geologic investigation area.
- Build a endemic plant landscape on roadside of the countryside and the seeds base and spreading center of endemic plants.
- Improve the sanitary conditions of environment and the energy structure in household, further to develop the methane generating pit and readjust the energy structure of household.
- Instruct farmers to cultivate farmland and build the rural landscape, and develop the economic forest and orchard to form a deeply local landscape.
- Control number and dimension of quarries and implement the restoration of landscape and ecology around the natural remains.

(III) Management of tourist activity

- Control types and frequency of scientific investigation tour both of geology and biodiversity, and plan and encourage the rural ecological tour.
- Mark the granite geological remains and their scientific significance.
- Mark the conserved water sources.
- Mark the reserve for endemic plant community.
- Compile the promotion handbooks on scientific values of the scenic area.

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Notes on Compilation

1. Recent Management Plan complies with the regulations and requirements of management plan on scenic zones of the state, and understanding in the implementation of ‘General Plan on Mount Sanqingshan National Park (2003-2020)’ (2005).

2. Recent Management Plan has referred to ‘Operational Guidelines for the Implementation Of the World Heritage Convention,(2005,2)(‘Guidelines’ for short) in compilation.

3. The understanding of Management system is sourced from clauses 108-119 of the ‘Guidelines’. An effective management system could include the following aspects:

1) Each nominated property should have an appropriate management plan or other documented management system which should specify how the outstanding universal value of a property should be preserved, preferably through participatory means.

2) The purpose of a management system is to ensure the effective protection of the nominated property for present and future generations.

3) An effective management system depends on the type, characteristics and needs of the nominated property and its cultural and natural context. Management systems may vary according to different cultural perspectives, the resources available and other factors. They may incorporate traditional practices, existing urban and regional planning instruments, and other planning control mechanisms, both formal and informal.

4) In recognizing the diversity mentioned above, common elements of an effective management system could include:

a) a thorough shared understanding of the property by all stakeholders;

b) a cycle of planning, Implementation, monitoring, evaluation and feedback;

c) the involvement of partners and stakeholders;

d) the allocation of necessary resources;

e) capacity-building; and

f) an accountable, transparent description of how the management system functions.

4. Recent Management Plan is based on the understanding of relevant criteria and terms.

1) The ‘Outstanding universal value’ is stipulated in Clause 77 of the ‘Guidelines’, in which criterion VII, criterion VIII and criterion IX would fit Mount Sanqingshan National Park, i.e

Criterion VII: contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

Criterion VIII : be outstanding examples representing major stages of earth’s history, including the record of life, significant on-going geologic processes in the development of landforms, or significant geomorphic of physiographic features;

Criterion IX: be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.

2)The ‘Integrity’ is specified in Clauses 87-95 of the ‘Guidelines’

Integrity (Clause 88): Integrity is a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Examining the conditions of integrity, therefore requires assessing the extent to

which the property:

- a) includes all elements necessary to express its outstanding universal value;
- b) is of adequate size to ensure the complete representation of the features and processes which convey the property's significance;
- c) suffer from adverse effects of development and/or neglect.

'Relatively intact' is specified in Clause 90 of the 'Guidelines':

For all properties nominated under criteria VII - X, biophysical processes and landform features should be relatively intact. However it is recognized that no area is totally pristine and that all natural areas are in a dynamic state, and to some extent involve contact with people. Human activities, including those of traditional societies and local communities, often occur in natural areas. These activities may be consistent with the outstanding universal value of the area where they are ecologically sustainable.

Properties proposed under criterion VII should be of outstanding universal value and include areas that are essential for maintaining the beauty of the property.

Properties proposed under criterion VIII should contain all or most of the key interrelated and interdependent elements in their natural relationships. From this point of view Protection elements and area were analyzed. Property proposed under criterion IX should have sufficient size and contain the necessary elements to demonstrate the key aspects of processes that are essential for the long ter conservation of the ecosystems and the biological diversity theu contain.

3)The understanding on 'Protection and Management' of World Heritages came from Clauses 96-99 of the 'Guidelines'

Protection and management of World Heritage properties should ensure that outstanding universal value, the conditions of integrity and/or authenticity at the time of inscription are maintained or enhanced in the future.

All properties inscribed on the World Heritage List must have adequate long-term legislative, regulatory, institutional and/or traditional protection and management to ensure their safeguarding. This protection should include adequately delineated boundaries. Similarly States Parties should demonstrate adequate protection at the national, regional, municipal, and/or traditional level for the nominated property.

Legislative and regulatory measures at national and local levels should assure the survival of the property and its protection against development and change that might negatively impact the outstanding universal value, or the integrity and/or authenticity of the property. States Parties should also assure the full and effective implementation of such measures.

4)The understanding of 'Boundary' is specified in Clauses 99, 101 and 102 of the 'Guidelines'

The delineation of boundaries is an essential requirement in the establishment of effective protection of nominated properties.

For properties nominated under criteria VII - X , boundaries should reflect the spatial requirements of habitats, species, processes or phenomena that provide the basis for their inscription on the World Heritage List. The boundaries should include sufficient areas immediately adjacent to the area of outstanding universal value in order to protect the property's heritage values from direct effect of human encroachments and impacts of resources use outside of the nominated area.

The boundary of the nominated property is consistent to that of Mount Sanqingshan National Park.

5)The understanding of 'Buffer Zone' is stipulated in Clause 103~107 of the 'Guidelines'

Wherever necessary for the proper conservation of the property, an adequate buffer zone should be provided. For the purpose of effective protection of the nominated property, a buffer zone is an area surrounding the nominated property which has complementary legal and/or customary restrictions placed on its use and development to give an added layer of protection of the property. This should include immediate setting of the nominated property, important views and other areas or attributes that are functionally important as a support to the property and its protection. The area constituting the buffer zone should be determined in each case through appropriate mechanisms. Details on the size, characteristics and authorized uses of a buffer zone, as well as a map indicating the precise boundaries of the property and its buffer zone, should be provided in the nomination. A clear explanation of how the buffer zone protects the property should be also provided.

Where no buffer zone is proposed, the nomination should include a statement as to why a buffer zone is not required.

Although buffer zones are not normally part of the nominated property, any modifications to the buffer zone subsequent to inscription of a property on the World Heritage List should be approved by the World Heritage Committee.

6)The understanding of 'Sustainable use' is specified in Clause 119 of the 'Guidelines'

World Heritage properties may support a variety of ongoing and proposed uses that are ecologically and culturally sustainable. The state party and partners must ensure that such sustainable use does not adversely impact outstanding universal value, integrity and/or authenticity of the property. Furthermore, any uses should be ecologically and culturally sustainable. For some properties, human use would not be appropriate.

Annex

Fig.1 Location of Mount Sanqingshan Nominated Property in China

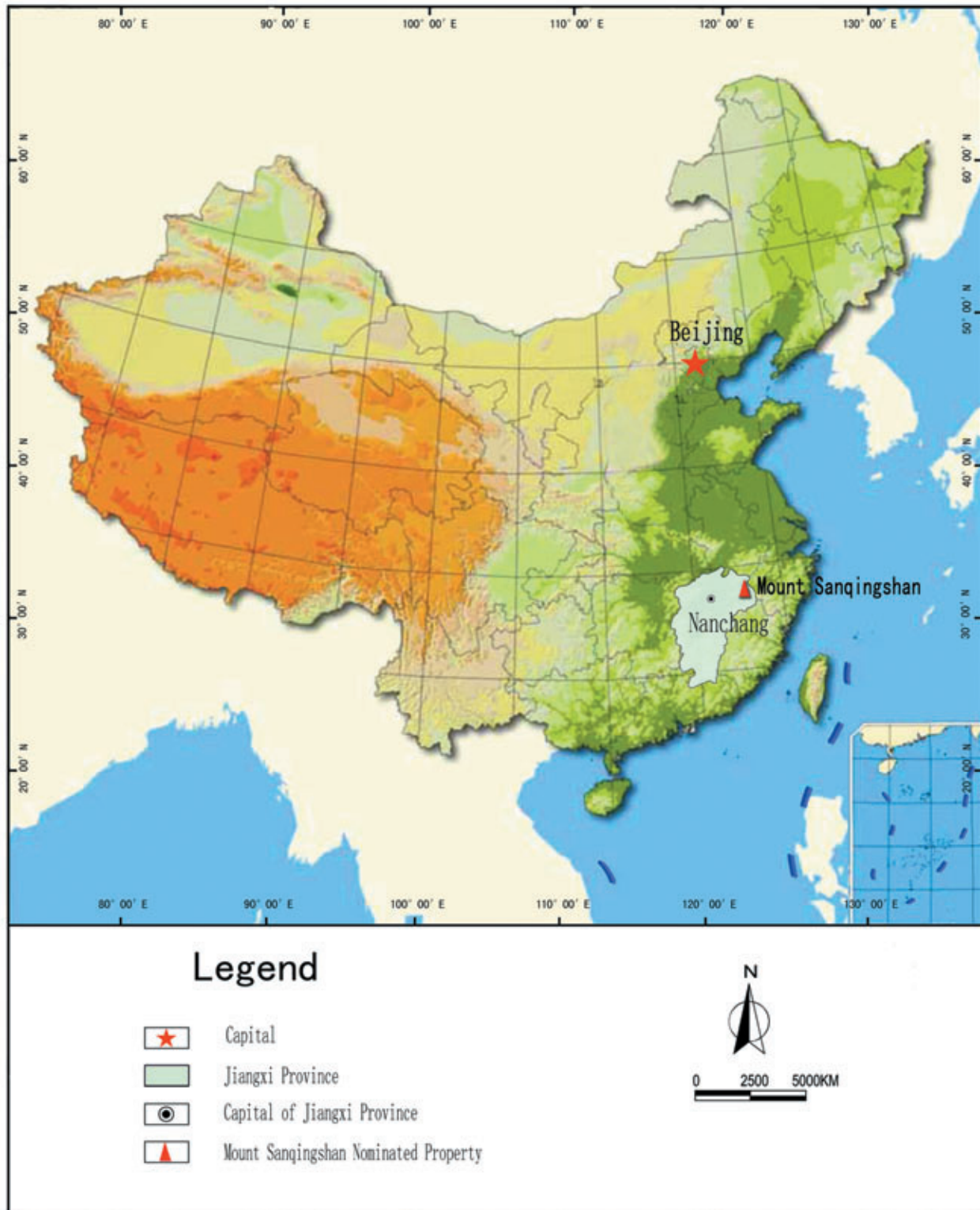


Fig.2 Location of Mount Sanqingshan Nominated Property in Jiangxi Province

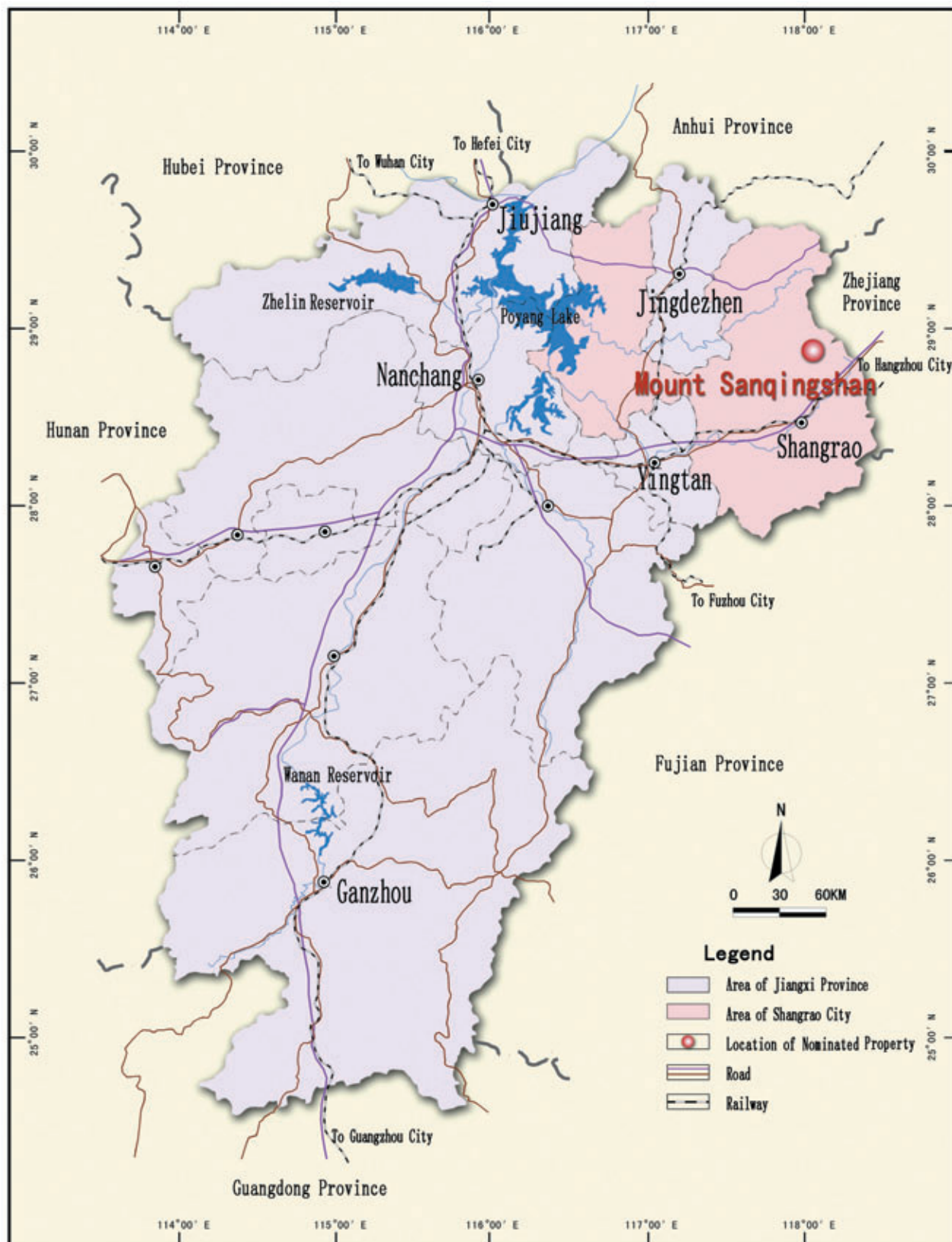


Fig.3 Satellite Imagery of Mount Sanqingshan Nominated Property

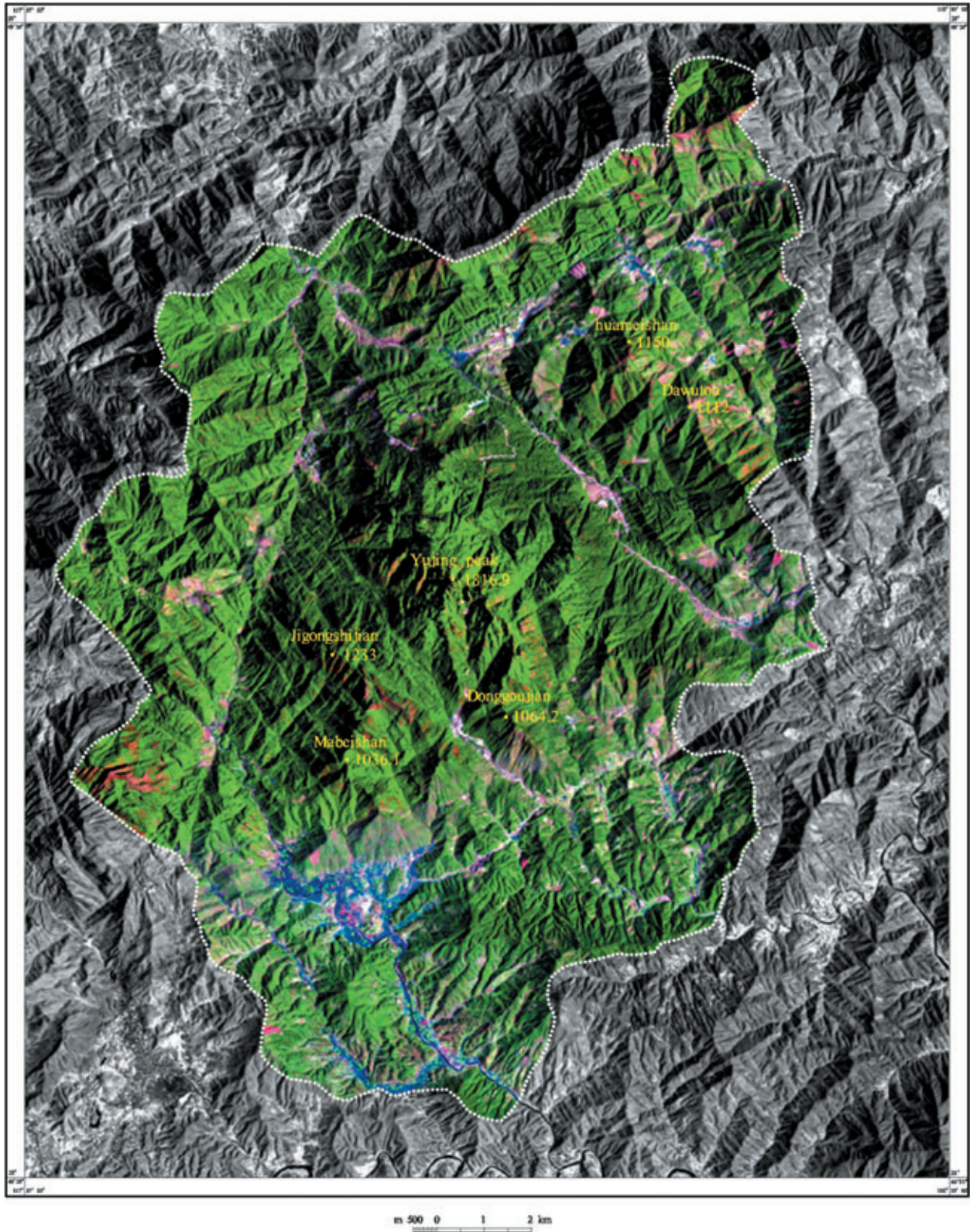


Fig.4 Detail of Mount Sanqingshan Nominated Property

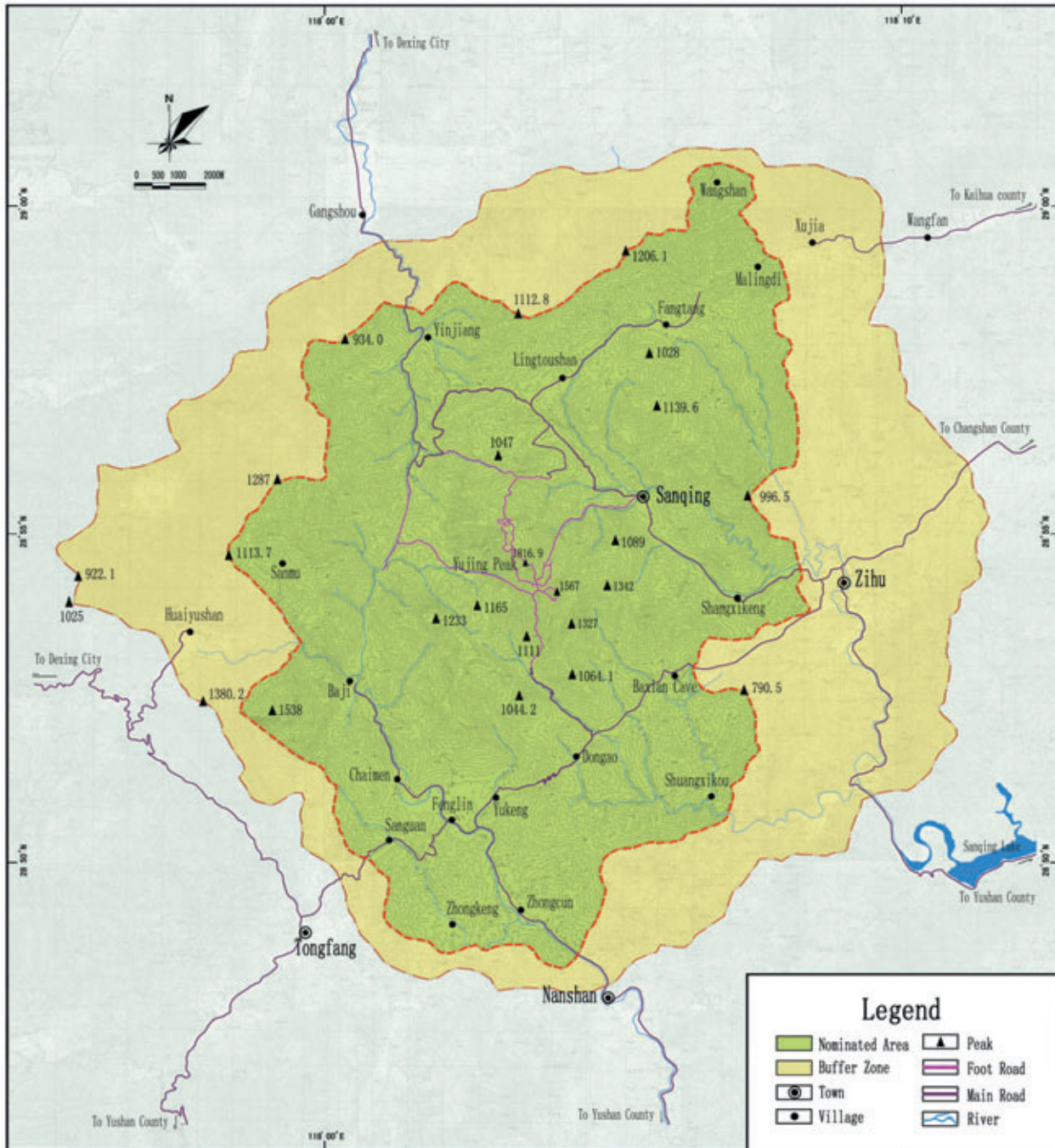


Fig.5 Relationship of Mount Sanqingshan Nominated Property to Protected Area

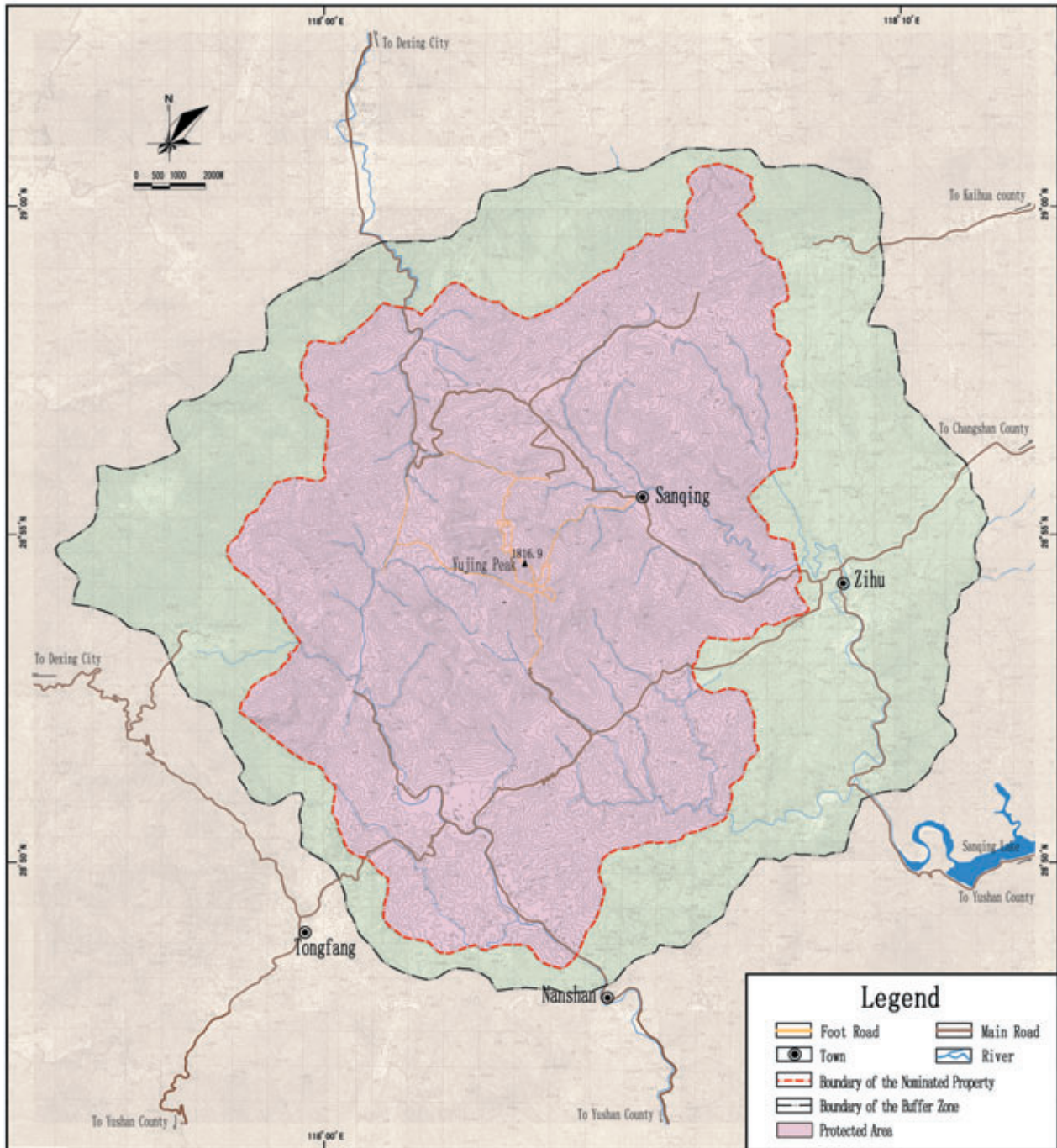


Fig.6 Master Plan of Mount Sanqingshan Nominated Area

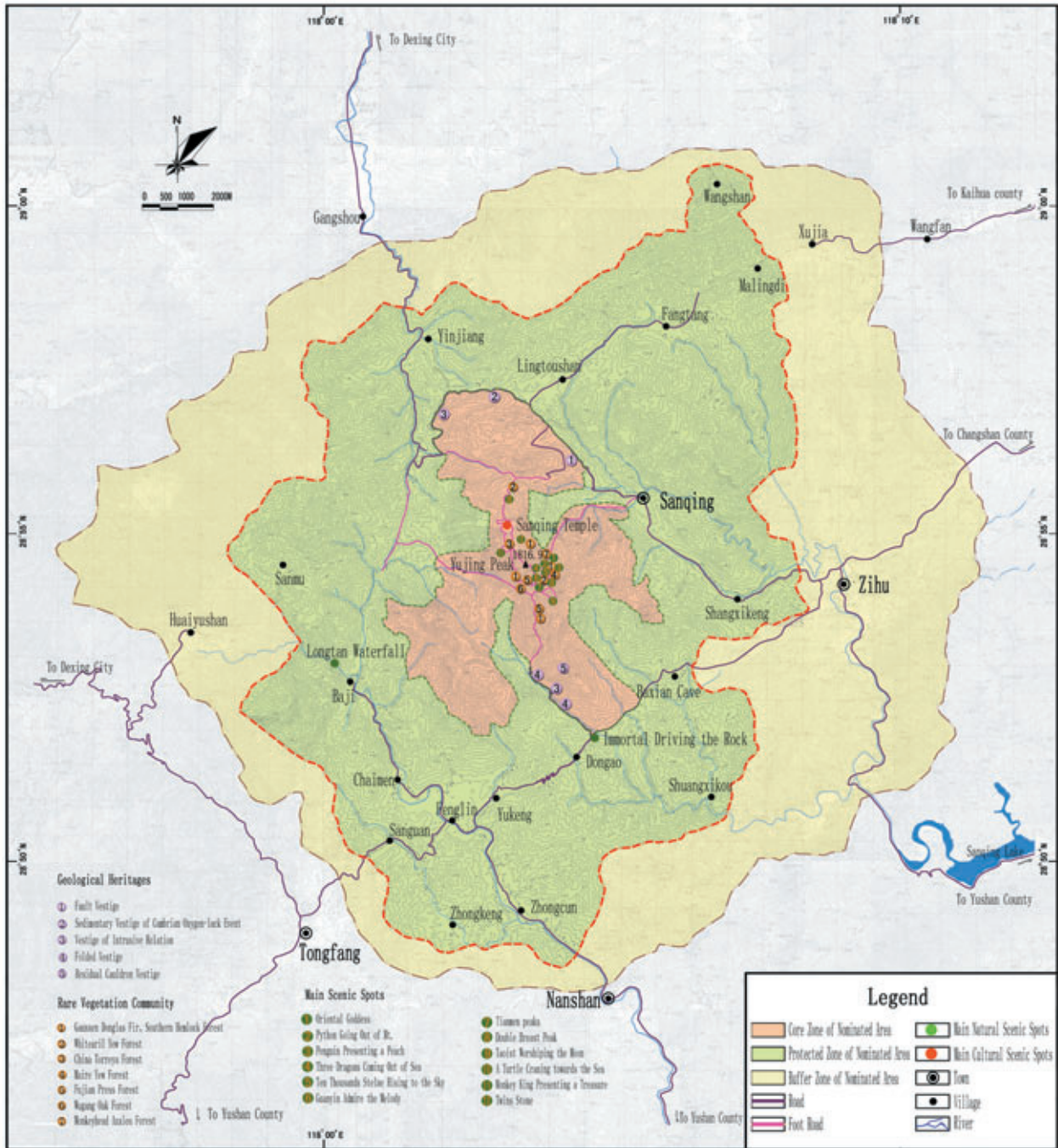
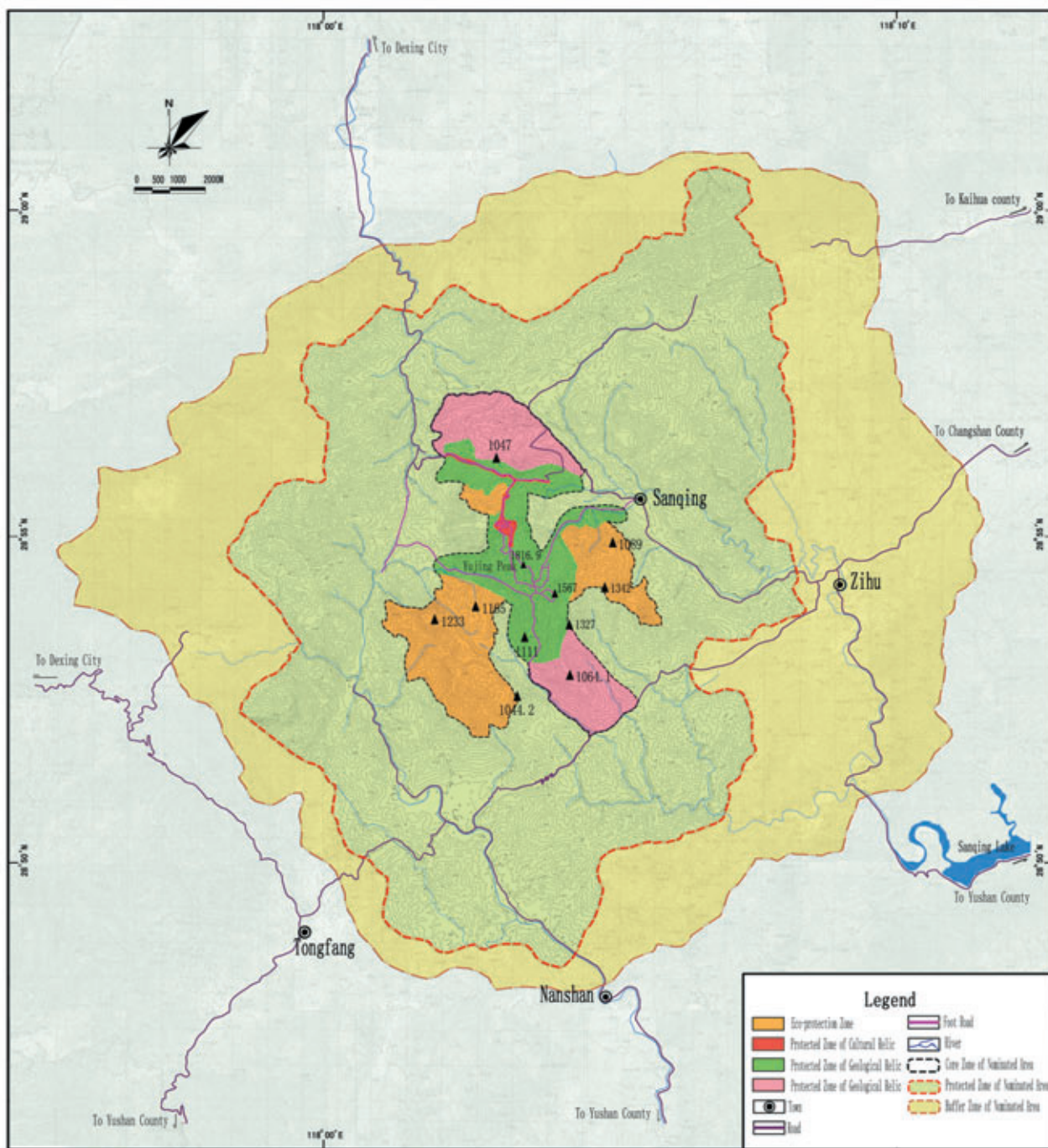


Fig.7 Divisional Protected Area of Mount Sanqingshan Nominated Area



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APPENDIX ONE

Abstract of the General Plan of Mount Sanqingshan National Park

To effectively protect the outstanding natural resources of Mount Sanqingshan while with an aim to built the national park into first class in China and international renowned, the management committee adopted the regional coordinative development strategy of “Sightseeing up the mountain, while accommodation down. Traveling in the park, while living in the city ”. In 2003, the management committee entrusted Jiangxi Provincial Urban and Rural Planning Institute to compile the General Plan of Mount Sanqingshan National Park (2003--2020), which was approved by the State Council upon examination of Ministry of Construction in 2005. In the last two decades, the Jiangxi Provincial Urban and Rural Planning Institute was also commissioned by the responsible management agency to compile the previous General Plans of Mount Sanqingshan in different stages, which guided the protection and development of the national park effectively.

Chapter one General provisions

1. The General Plan of Mount Sanqingshan National Park (hereinafter referred as General Plan), was compiled on the basis of a comprehensive investigation of the natural resources, and in accordance of the relevant laws and regulations. The General plan will act as the scientific basis for strict conservation, unified management, reasonable exploration and sustainable utilization.

2. With the prerequisite of conserve the natural resource intact so as to pass down from generations to generations, the General Plan aims to giving full play to natural and cultural resources of the park, realizing a coordinative development of social benefit, environmental benefit and economic benefit.

3. The Plan documents contains: planning book, planning manual, a collection of the related material, planning map. The planning book was approved by the State Council, with statutory force, will act as the guideline for the protection and development of the national park

4. The bases of formulating the General Plan are:

Forest Law of the People's Republic of China

Environmental Protection Law of the People's Republic of China

City Planning Law of the People's Republic of China
Law of the People's Republic of China on the Protection of Cultural Relics
Water Law of the People's Republic of China
Law of the People's Republic of China on the Protection of Wildlife
Land Administration Law of the People's Republic of China
Law of the People's Republic of China on Water and Soil Conservation
Flood Control Law of the People's Republic of China
Convention Concerning the Protection of the World Cultural and Natural Heritage
Convention on Biological Diversity
Tentative provision of national park, promulgated by the State Council in July 1985
Management measures on national park of Jiangxi Province, decree of the provincial government, No.100, July 2000.
Planning standards for national park, issued in Jun.2000
Notification concerning strengthen the management and protection of the national park, issued by General Office of the State Council of the People's Republic of China in 1995
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Management measures on the compiling of planning of national parks, issued by Ministry of Construction in 2001
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General Plan of Mount Sanqingshan National Park(1993), compiled by Jiangxi Provincial Urban and Rural Planning Institute.
Approval of the General Plan of Mount Sanqingshan National Park, issued by the Ministry of Construction in 1994
General plan on protection and maintenance of cultural relics of Mount Sanqingshan National Park, joint compiled by the management department of Mount Sanqingshan National park and cultural relics protection station of Shangrao City in 1989.
Tentative provision on planning, forest management, resources protection and land administration, issued by Mount Sanqingshan National Park Management Committee in 1997

5. Planning Guideline

Strictly abide the principle on development of national park advocated by Ministry of Construction: strict protection, unified management, reasonable exploration and sustainable utilization. Put special emphasis on ecology protection, insist on sustainable development strategy.

Chapter two Area and features of the national park

1. the principal according to which the nominated site is delimited:

- (1) the landscape and its eco-environment integrity
- (2) the conventional continuity
- (3) the relatively independent regional unit
- (4) The feasibility of protection and utilization, as well as management

2. Area of the National park

The Mount Sanqingshan National Park is with a planning area of 229.5 square kilometers. Specifically the national park extends in the east from Malingdi, through Xikeng, Baxiandong, far away to Shuangxikou; then runs in the south along Shuangxikou, Zhongcun, to the distant Sanguan; next winds in the west along Sanguan, through Caimen, Baji, Sanmou, far away to Yinjiang; extends in the north along Yinjiang, through Yinjiang, Lingtoushan, Fangtang, at last back to the Malingdi.

The plan does no change to the area delimited in the previous General plan

3. The peripheral protected area

It is planned to delimit 168.5 square kilometers around the national park as peripheral protected area with consideration of the resource distribution and their continuity.

4. Feature of the National Park

Mount Sanqingshan is characterized for its rare granite mountain natural landscape, important biology resource, unique Taoist culture, and diverse bio-vegetation landscape. Mount Sanqingshan should function as a national park for sightseeing, artist inspiration, scientific research and scientific education.

Chapter three Basic principles for planning

1. Principle of ecology protection
2. Principle of harmonious development
3. Principle of stress the character
4. Principle of flexible development
5. Principle of unified planning, time implementation and coordinative development.

Chapter four Planning period

The plan spanning over 18 years can be divided into recent plan, medium term plan and long term plan:

Recent plan covers from 2003 to 2005

Medium term plan covers from 2006 to 2010

Long term plan covers from 2011 to 2020

Chapter five Planning objectives

1. Principle of identify objective

(1) Earnestly implement the guideline of strict protection, unified management, reasonable exploration and sustainable utilization.

(2) Properly deal with the relationship of the past, present and the future interest

(3) To take actions that suit local circumstances so as to reach the harmony between man and nature.

(4) Strike balance between resource conservation and comprehensive utilization,

2. The overall objective

Build Mount Sanqingshan into a first class National Park in the world with outstanding natural beauty, health ecosystem, friendly environment, and excellent tourist service. Apply to nominate Mount Sanqingshan as a world natural heritage site.

3. Recent planning objectives

Emphasis should be on building Jinsha tourist reception and service center; connect the south tourist reception base and north tourist reception base by building the tourist road in the east; improve the walking trail system in the central area of national park; build cable cars in the north and east respectively, which would provide favorable facility for “sightseeing up the mountain while accommodation down”; strengthen the protection of eco-environment and landscape.

4. Medium term planning objectives

Emphasis should be on the environmental rehabilitation and ecology recovery in Tiyunling scenic area; improve the infrastructure and recreational facilities down the mountain; realize the objective of “sightseeing up the mountain while accommodation down”; construct the traffic system mode of “two rings with one connecting axle”.

5. Resource protection objectives

(1) Build the nation park into one integrates the ecological value, cultural value and scientific research value.

(2) Keep the forest vegetation intact and wildlife habitat undisturbed; Emphasis should be on the protection of endemic species; guard against invasive species; endeavor to recover the original mix forest so as to ensure the integrity of eco-system and continuity of ecological evolution. Periodically close parts of forest area to enable recovery of the ecology.

(3) Maintain and protect the existing natural watershed, protect the vegetation intact.

(4) To eliminate any industrial and mining activity in the national park. Any other activity against the protection should be brought to an end resolutely. Minimize the negative affect of tourist activity to environment.

Chapter six Environmental capacity and ecological principles

1. Reasonable visitors capacity

The plan establish that the national park with a reasonable capacity of 7400 tourist\day. It is planned that the tourism number to be controlled within 800,000 by 2010.

2. Residents population control

Currently residents in Mt. Sanqingshan national park is 5790, and the total cultivated land area is 8334 acres. Until 2020, the residents population in the national park will be 6577. With the development of tourism industry, the residents in the park shall be controlled within 9800, including the tourism service personnel 3200.

3. Construction capacity of the national park

Because of the steep terrain of Mt. Sanqingshan and the shortage of land building, the construction capacity should be strictly controlled.

4. Control measures on construction

(1) Control the size of residential building

(2)Demolish the illegal buildings in National Park and restore the scenic environment of Sanqing Temple area.

(3) Remove the accommodation facilities down the mountain in Tiyuling and take measures to rehabilitate the environment.

Chapter seven Functional zones and planning distribution

1. Principles of identifying functional zones

Functional zones should be reasonably defined with the principle of “protection first, rational development and sustainable utilization”.

2. Functional zone

It is planned with four categories of the functional zone: ecological protection zone, exhibition zone, tourist reception zone and construction control zone.

3. Landscape tour system

Mt. Sanqingshan Landscape tour system is planned with three-grade distribution, namely, the National Park---7 major scenic zones---120 planned attractions.

| | | | |
|--|--------------------------------|---|---------------------------------|
| Mt. Sanqing- shan National Park | Tiyunling scenic zone | the most concentrated and the absolutely peculiar peaks | More than 120 attractions |
| | Yujingfeng scenic zone | The main peak | |
| | Sanqing temple scenic zone | Assemble the special Taoist culture remainins | |
| | Xihuatai scenic zone | With large areas of original <i>pinus Taiwanese</i> community and outstanding combination of nature and humanity. | |
| | Yulingguang scenic zone | Highly with rustic charm, particularly characterized for stone forest | |
| | Bingyudong scenic zone | Based on waterscape, numerous district waterfalls and ponds. | |
| | Xianqiaodun scenic zone | The best place to view the sea of clouds and afterglow | |
| | Three independent scenic spots | Jade Curtain Falls, Baji pond, Fuliangkeng Reservoir | |

4. Management System

In terms of natural resources protection, the national park should establish a management system in three levels, which is headed by the resource management department.

| | | |
|-------------------------------------|--------------------------------|---|
| The resource management Departement | Waishuangxi management station | Oriental Goddess management point Tiyunling management Waishuangxi management point |
| | Jingsha management station | Lingtoushan management point Fangtan management point Shangxikeng management point Bingyudong management point |
| | Fenshui management station | Yingjiang management point Biyuyan management point Fengmen management point Yusongling management Hengtan management point |
| | Fenglin management station | Baxiandong management point Baji management point Zhongcun management point |

5. Village system

A three grade village system is planned in the national park namely tourism town - administrative village - natural village.

| Village | Develop mode | notes |
|-------------|-----------------|--|
| Dongao | To be shrink | The residents are to relocate to Fenglin, Nanshan, turn a part of them into service personnel. To readjust the local industrial structure |
| Baji | To be shrink | |
| Shangxikeng | To be shrink | Parts of residents are to relocate to Xincun and Zihu. |
| Malingdi | Size controlled | Villagers in remote areas are encouraged to move to administrative village. |
| Yukeng | Size controlled | Control population growth; adjust industrial structure; Develop the tourism industry; |
| Lingtoushan | Size controlled | |
| Fangtang | Size controlled | |
| Yingjiang | Size controlled | |
| Caimen | To be expanded | Accept the neighboring transferring residents. |

| | | |
|-------------|-----------------|--|
| Fenglin | To be expanded | Accept the neighboring transferring residents. |
| Sanguang | Size controlled | Control population growth and develop the tourism industry. |
| Zhongcun | To be expanded | Accept the neighboring transferring residents. |
| Zhongkeng | Size controlled | Villagers in remote areas are encouraged to move to administrative village. |
| Sanmu | To be relocated | Villagers in remote areas are encouraged to move to administrative village. |
| Shuangxikou | To be shrink | Control population growth; develop the tourism industry; Villagers in remote areas are encouraged to move to administrative village. |
| Baxiandong | To be shrink | |

Chapter eight Protection and nurturing planning

1. Protection in different area

According to the different characteristics of the landscape and resource, this plan defines six protection zones: ecological protected area, natural landscape protected areas, historical relics protected areas, landscape restoration area, scenic tourist area, development and control areas. Different protecting measure should be conducted according to their different states.

2. Protection in different grade

Based on the value and regional association characteristics of the national park, this plan divides the park into Special grade protection area, Grad I protection area, Grade II protection area and Grade III protection area. This plan also identifies the protection requirements in each grade.

(1) Special grade protection area

The Special grade protection area is equivalent to the range of ecological protection area.

(2) Grade I protection area

In the Grade I protection area, only necessary tourist walkways and safety devices are allowed; Tourist number should be controlled; construction of facilities irrelevant to the landscape should be prohibited, and accommodation must not be arranged within the zone. The motor vehicle should not be allowed to enter. Any unfavorable elements against the conservation should be forbidden, such as cultivating, tree felling and so on.

(3) Grade II protection area

Investigation of land use should be conducted in the area. A small amount of

accommodation and restaurants can be arranged in the zone, but any construction irrelevant to sightseeing must be restricted. All the building must have strictly control with regards to its size, shape, material and style. No reclaiming farmland, burning and tree felling.

(4) Grade III protection area

In this zone, the existing land use patterns could be allowed; The various tourist service facilities which go harmonious with its environment could be established; orderly production and management facilities can exist; Any construction and facility should be controlled with regards to its shape, size and material, and with consideration of its affects to water, noise and soil erosion; No quarrying, sand mining, tree felling and forest burning. Any project facilities with a significant impact on the landscape and the environment must be included in the socio-economic development plan.

3. The designation and protection of the central area

The central area is composed of the natural landscape protection area, the historical relics protection area and the ecological protection area. In total, it is with an area of 71 square kilometers.

The protection of central area is to ensure the best scenic environment and sustainable utilization with the premise of strict protection, to protect the ecological environment and biological diversity of the scenic area. Except for the protection and scenery exhibition facilities, other tourist reception construction should be strictly regulated outside the central area.

Chapter nine Tourist Facilities Plan

1. Planning Principles

(1) Tourist service facilities should be mainly established in the reception base, to facilitate tourists traveling in the national park

(2) Tourist service facilities ought to possess landscape sense. On the premise of fully maintaining natural landscape style, any construction should be built to be a landscape to some extend.

2. Planning Layout

As a tourist reception centre, Jinsha primarily provides service reception facilities for tourists during traveling in the national park. In addition, a four-level tourist service

system has been planned, namely, Fenglin, Waishuangxi, Fenshui reception station, Tingyunling, Yunsongling Fangtang reception point, and shopping and tea rooms in the key scenic areas.

(1) Service and reception centre

Jinsha is reception and tourist centre as well as management and conservation centre. It is planned with 3000 beds and a construction area of 139ha stretching to Zihu direction. This area is to be equipped with comprehensive entertainment facilities, which is the key point in the recent-term and mid-term development.

(2) Service and reception station

In order to achieve the goal of “sightseeing in the mountain, accommodation down the mountain”, it is planned to build three visitor centres in the three main entrances, equipped with three cableways, Apart from Jinsha reception centre, there are Waishuangxi and Fenshui reception station, with planned 1500 beds and 200 beds respectively and other relevant service facilities.

(3) Service and reception point

Properly situated, reception point is the intermediate links in the whole service system. Its service function and construction standard may be lower than the reception station. The appearance of the construction including model, size and shape is required to go extremely well with its surroundings.

It is planned to establish 15 management and conservation points.

(4) Shopping and tea room

With fully consideration of the scale, distribution and the protection requirement, it is planned to establish 22 shopping and tea room at the key scenic spots such as the top of A Ray of Sky, Gigantic Boa, Oriental Goddess, the bottom of A Ray of Sky, Jade Platform, Yuhuang Summit, the crossing of Yujing Peak, Pipa Pavilion, Wind Gate, Brave Man Slope and Yuling Temple. It is planned the shopping and tea room combine the toilet (small-size and disposable), rubbish can and other service facilities to perform its service function and meet the demand of tourists.

Chapter ten Transportation Plan

The road in the national park is planned to be divided into main road and secondary road.

1. Main road

The main road, is planned with a length of 58.5 kilometers, covers from Waishaungxi, Pingxi, Jinsha, Fenshui, to Xiaoguan Huanshan Road. It links all the transportation within the national park with the outside.

2. Secondary road

The secondary road, with a total length of 54.8 kilometers, covers 8 sections, i.e. Fenshui-Biyuyan, Baishawei-Yuling Temple, Baishawei-Lingtoushan-Fangtang-Madiling, Lingtoushan-huameishan, Pingjiayuan-Fangtang-Zhuzhang-Zhuzhang-Zihu, Shangxikeng-Jidi, Fenshui-Qianfen cableway station, Baxiandong-Shuangxikou, all of which belongs to second or third-class road made of asphalt. These roads stretch far to the villages and the scenic spots at the foot of the mountain.

3. Planning of walking trail

The existing walking trails remain unchanged. It is planned to newly build a walking trail in the east, 4 kilometers long, 1.5-2.5 meters wide, mainly paved with banded stone or pebble, for the tourists' convenience and safety, thus forming a circle of tourist trail. The total length of the walking trails will be 49.3 kilometers.

4. Cableway construction

The existing cableway from Waishuangxi to Tiyunling is kept at present and to be transformed in the future. It is planned to newly build one cableway from Jinsha Huangmaogang to northeastern part of Oriental Goddess in the recent term and another cableway from Fenshui to Qianbumen in the long term, covering 2426m and 2500m respectively. The three cableways link the scenic spot with the three management & service stations down the mountain, favorable to the protection of the natural resources in Mt Sanqingshan.

Chapter eleven Infrastructure Plan

1. Water supply and drainage plan

(1) Water supply and drainage prediction

Total water consumption in recent-term may be 2918 ton/day

Total water consumption in medium-term may be 5785 ton/day

Total water consumption in long-term may be 10672 ton/day

(2) Water plant plan

It is planned to build Jinsha, Waishuangxi and Fenshui water plants, with its water supply capacity reached 5,040 tons / day, 1,200 tons / day and 750 tons / day respectively. In

Tiyunling it is planned with a pool supplying water for Tiyunling reception point; its water supply capacity is planned with 354 tons / day.

In the long-term plan, it is planned to build Fenglin water plant with water supply capacity of 1160 tons/day, a pool in Yusongling reception point with water supply capacity of 80tons/day. In Fangtang village, it is planned to supply water for Fangtang reception point and residents through extracting the groundwater, its water supply capacity will reach 240 ton/day.

The residents in Dong'ao, Baji and other villages solve problems of water through drilling well for the groundwater. Especial attention should be paid to sanitation around every water plant and water source. Discharge domestic sewage and other pollutants nearby the water source should be strictly prohibited.

Water resource conservation and disposal of polluted water should be enhanced. Any proposal construction should undergo water consume assessment.

(3) Discharge of sewage

The plan supposes the amount of discharged sewage accounts for 80% of the total water consumption. So the discharge of sewage may reach 2335 tons/day in recent-term, 4628 tons/day in mid-term, 8538 tons/day in long-term.

(4) Planning on sewage treatment plant

It is planned to build Jinsha, Waishuangxi and Fenshui sewage treatment station, its sewage treatment capacity reached 4032 tons/day, 512 tons/day, and 600 tons/day. In Tingyunling, the existing sewage treatment pool is to be transformed, thus its capacity will reach 280 tons/day.

In the long-term plan, it is planned to build Fenglin and Fangtang sewage treatment station, its sewage treatment capacity reached 928 tons/day, and 192 tons/day. Yusongling sewage treatment pool is to be built; its sewage treatment capacity reached 32 tons/day.

2. Planning on environment conservation

(1) Environment conservation division

This plan divides the national park into key protected area, common protected area, key treatment area and pollution controlled area.

Key protected areas: strictly keep the environment quality on air, water, noise up to the

regulated standard; any building does not related to tourism but bring negative affect to the environment should not exist; pollutants in the reception and service points ought to undergo strict treatment and up to the regulated standard; Emphasis should be put on the main water source conservation.

Key treatment Area: the area suffers from over-construction or pollution due to poor management is regarded as key treatment area. Comprehensive measures should be adopted rehabilitate the environment; the planned key treatment area covers Tiyunling, Waishuangxi, and Jinsha.

Common Protected Area: the areas apart from key protected areas and key treatment areas are regarded to be common protected areas, where the environmental quality should meet state's standard.

Pollution Controlled Area is the area between three grade protection area and peripheral protected area, where the environmental quality should be controlled up to state standard.

It is planned to set up waste treatment field in the surrounding of the national park

This plan requires tourist service reception base and residents within the national park alter the fuel structure, make use of the electricity instead of coal and petroleum gas, so as to improve air condition.

(2) Water source conservation

Based on the terrain, water systems and water supply construction in the national park, the scope of the water source protected area should be delimited. Jinsha, Waishuangxi, Fenshui and Tiyunling, Yusongling water source areas is designated to be the first class protected area, where water quality should up to grade II standard in GB3838—2002.

(3) Water and soil conservation measures

The conservation measures are formulated in accordance with the Law of the People's Republic of China on Water and Soil Conservation as follows:

Land reclamation, sand-digging, earth-fetching, quarrying and destroying vegetation shall be prohibited within the national park;

In the case of tree-felling in forest areas, the water and soil conservation measures should be adopted in the felling programme;

The people's government at all levels shall regard the work of water and soil conservation as an important duty, and set up a system of target responsibility for water and soil conservation adopted for governmental leaders' terms of office;

In the course of construction within national park, the water and soil conservation programme should be strictly examined;

(4) Noise control within national park

a. Noise level allowed in the national park should be kept below 50dB in the day ,while below 40dB at night.

b. Motor vehicles and vessels are the major source of noise pollution, so different charges to various diesel engines and gasoline engines should put into effect. Meanwhile, the environmental friendly vehicles should be encouraged to enter the national park. Honking should be forbidden within the national park.

c. The forest zones at both sides of the major planned road shall be set up for the purpose of reducing noise and dust.

d. In the surrounding area of the central zone of national park (ecological protection area), broads shall be set up to notice tourist guides and visitors not to turn on radios and shout loudly.

(5) Atmospheric pollution control within national park

a. The atmospheric environment quality should up to the State's first-class standard of GB3095-1996.

b. Class A (highest standard)charge should be carried out in respect of enterprises discharge and motor vehicles and vessels discharge that fail to meet the State standard for pollutant discharge.

c. Efforts should be made to popularize the clear energy, including electricity, solar energy and marsh gas. Essential supports with regard to administration, finance, and technique should be given until burning of coal and fuel is eliminated.

3. Wildlife conservation plan

a. Improve observation and registration of wildlife resources.

b. Mark the ecological protection area where tree felling and hunting should be strictly

prohibited.

c. Protect and nurture the zonal plant species, especially the rare species. On-site conservation should be combined with off-site preservation and breeding. Introduce those breeding species to the secondary species community to improve its structure.

d. In the surrounding area of the national park, hunting season should be regulated and hunting quota should be stipulated.

e. Increase the population of wildlife by means of creating an eco-friendly environment and breeding. Take active measures to prevent forest pest. Build fire break forest belt to prevent forest fire.

f. Establish a system of regular education on ecological protection to public. Establish a symbol system of wildlife and plant identification.

g. Construct nurseries to grow seedlings of native and relict species, to speed up replenishment of native forest. Advocate the use of native soil favorable to indigenous plants and show the list of native species, their identification and cultivation technology;

h. Strictly carry out the relevant regulations of "Law on Forest" And "Law on the Protection of Wildlife" under the supervision of the relevant department of administration.

4. Disaster Prevention Planning

(1) Flood prevention

To protect Jinsha stream against floodwater disaster that happens once every 50 to 100 years; to protect the other streams within protected area against the flood water happens once every 10 years. Carry out the regulations on river and water protection in "Water Law", "Flood Prevention Law" and "Regulations on River Administration".

The construction of flood-prevention ditches, erection of obstacles, afforestation, and water and soil conservation measures should be carried out in the area where the landslide, collapse and mud-rock flows are liable to occur. Monitoring on geological disasters and disaster prevention alarm system should be strengthened; Emergency counter-measures should be worked out; Permanent buildings should avoid locating in geological fault position.

Formulate emergency scheme for mountain torrent. Any construction projects within national park should not be located where mountain torrent is liable to occur.

(2) Fire prevention

The projects of vegetation and corridor against fire should be strengthened, nonflammable plants like *Schima superba* forming isolated zone should be planted along high-voltage line and 10KV electric line around each scenic area and key scenic spot, to prevent fire caused by electricity. The big cistern and the fire extinguishers should be kept near important ancient buildings.

Pay close attention to cultivating the visitors' consciousness of safety and forest fire prevention; carry out strict fine measures to the offenders; strictly manage burning incense, the roasting in the open field and light fires; observers should be arranged at each service point, watch-tower should be established in Yujing Peak to timely observe the fire report within scenic areas.

(3) Forest pest prevention

Do regular monitoring on forest pest, treat forest pest by mean of spraying pharmaceutical.

Chapter twelve Planning of Land Use

| Order | Classification | Area(ha) | percent |
|-------|------------------------|----------|---------|
| 00 | The nominated area | 22950 | 100.00 |
| 01 | Forest land | 21992.4 | 95.83 |
| 02 | Farmland | 421.7 | 1.84 |
| 03 | Warter area | 160.2 | 0.70 |
| 04 | Service area | 124.5 | 0.54 |
| 05 | Residential land | 145.4 | 0.63 |
| 06 | Communication& project | 105.8 | 0.46 |

Chapter thirteen Suggestions and measures on implementing of the plan

1. Measures of implementing plan

(1) Governments at all levels should raise awareness on protecting and utilizing resources of national park.

(2) Give full play to management committee in macro-guidance and planning controlling. The management committee is responsible for examining and approving planning concerning tourist service projects.

(3) The management should strictly collect the resource utilizing fee on the enterprises stationed in the park according relevant regulation, which would finically guarantee the effective management. The invests on infrastructure and promotion every year shall be increase while the tourist income increased.

(4) To establish an effective coordinative mechanisms to promote active support from local governments and relevant government departments in protecting the national park.

(5) The religious activities in the park should be managed in accordance with laws and national religious policies.

(6) Promotion and education of the national park should be strengthened. On one hand, to publicize and introduce the park to potential tourist, while on the other hand, to publicize the value and potential threatens to visitors and locals to raise their awareness on protection.

2. Laws and Regulations on management

Actively promote and assist Jiangxi Provincial People's Congress to conduct legislative surgery and legislative hearing so as to promulgate Regulations of Jiangxi Province on the Management of Mt.Sanqingshan National Park as early as possible. Management Committee of Mount Sanqingshan National Park should establish certain management rules and implementation measures. For example, the examination and approval system for water and soil conservation programme in construction programme; Regulations on closing mountain to Facilitate Forestation for Forest Protection; Regulations on Conserving forest resource; Provisional Regulations on Forest Fire Prevention; Provisional Measures on the Administration of Travel Service.

Chapter fourteen Supplementary Articles

1. The Plan is to come into force as of the approval date by State Council.

2. The Plan shall be adjusted according to the measures of Provisional Regulations on the Administration of National Parks.
3. Jiangxi Provincial Construction Department is responsible for the interpretation of the Plan.

APPENDIX TWO

Confirmation on the Statements of Cable Cars

In the General Plan of Mount Sanqingshan National Park, three cable cars, located in the south, east and north part respectively, were planned from the foot to upper part of the mountain for the tourist's convenience of accessing. The upper terminals were planned at an elevation of 1200m (the summit of the peak at 1819.9m a.s.l.). One cable car existing have been built in 1996; One other began to construct in 2005 to alleviate the pressure of increasing tourist, and is anticipated to be completed by February 2008. This is to confirm the statement, having been made during IUCN field evaluation, that the plans of construction the third cable car have been abandoned.

APPENDIX THREE

Biological Statements to IUCN Questions

IUCN Questions:

Proposed statement of outstanding universal value and comparative analysis
-----Criterion ix: IUCN requests a review of the proposed statement of outstanding universal value to strengthen the case for globally significant biodiversity values under criterion ix.

The executive summary under 'justification statement of outstanding universal value' states that the 'the mountain is in forest of extremely high biodiversity' and that is 'one of the most important places in east asia for the protection of disjunct and relic plant species'. Both these statements need further qualification to make the case for the global significance of the nominated property. There needs to be an elaboration on the value of the property to the conservation of relic species, not just in China and East Asia but globally.

Under section 3b iv the nomination dossier concludes that the property 'has world significance in terms of biogeography and biosystematics'. In this regard IUCN believes a stronger case needs to be made as to why this is the case. For example, how important is the evidence contained within the nominated property to the global understanding of biogeography and biosystematics?

Further IUCN understands that the property contains in some cases the largest populations of number of plant species endemic to China and therefore could be argued to contain the largest populations of these species in the world. Clarification of this is requested.

1. Mt. Sanqingshan is the modern distribution and conservation center of “genera disjuncted between East Asia and North America” in the east of Asian continent, which has an important significance for the study of the temperate flora and relic plant communities at early Tertiary in the world.

(1) Definition of disjunction distribution: Disjunction distribution, also called discontinuous distribution, refers to the same or closely related taxa of plants occurring in

two or more widely separated regions. This is a common phenomenon in plant geography. Most taxa discussed are families, genera or species. The extent or distance of disjunction is obvious different from short-range to long-range, such as intercontinental, inter-country and inter-province disjunction. Accordingly, the occurrence epoch of disjunction was similar different, such as some primitive taxa formed before Tertiary, and other taxa after Tertiary, etc. Disjunction distribution between East Asia and North America is disjuncted by Pacific Ocean.

(2) The significance in the world: Disjunction distribution has long history in study. In 1716, this disjunction pattern was discovered in *Panax* by Jesuit, a French who found *Panax* distributed both in China and Canada. In 1750, J. P. Halenius, one of the students of Linnaeus, firstly discussed this phenomenon in scientific literature. In China, this pattern was successively studied by Hu H.-H. (1935, 1936), Li H.-L. (1952, 1972), Wu Z.-Y. (1991, 1993), Hong D.-Y. (1993) and others. With the introduction of molecular biology, the study of disjunction between East Asia and North America developed in depth, such as Wen and Jansen (1992), Wen J. (1996, 1998), Qiu and Parks (1995), Li and Donoghue (1999).

Disjunction has resulted from many reasons, which may be interpreted by the Continental Drift Theory, Island Forming Theory, and/or Land Bridge Theory. In conclusion, the complicate natural conditions and many kinds of development of historical events contributed to the forming of disjunction distribution. Plant geographers proposed many hypotheses to explain the disjunction by study on genera of disjunction.

a. Revealing the origin of flora and evolution. Based on Arctic Origin Theory and Continental Drift Theory: Firstly, Arctic Origin Theory, considered that angiosperms might firstly originate in the early Cretaceous, and the origin place was from arctic area. Secondly, Continental Drift Theory, considered that Eurasian Plate had been connected with North American Plate in late Jurassic to Cenozoic before the emergence of Bering Strait. The two regions had similar climate, and approximately identical floristic composition and elements, while those plant groups had communicated each other, and could form a continuous distribution region. In Cenozoic, the two regions were separated by Bering Strait, causing the former uniform flora being splited. Thenceforward, affected by the glacier from late Tertiary, the identical climate environment was destroyed, some floristic elements were extinguished, with others evolved towards different direction, and brought some new floristic patterns. The evolution has been up to the present the living relict plants are still remained and formed the phenomena of East Asia and North American disjunction.

The genera of disjunction between East Asia and North America are relic from Tertiary. They are evidence for Arctic Origin Theory and Continental Drift Theory. They could reveal the developed process of Tertiary flora or earlier in macroscopical view and changed process of geology, geography and climate and so on.

b. The species disjuncted between E. Asia and N. America could reveal the speed of evolution in microcosmic: Based on the current molecular biological evidences, the species-pairs, or the corresponding species between East Asia and North American discontinuous distribution, their differentiation time could be from several ten thousands to several ten millions of years. And species in E. Asia are more changeable than in N. America in DNA sequence. It can help reconstructing the process of species differentiation and paleogeography.

c. Revealing the reasons of species forming, process and pattern, moreover, mechanism of morphilogy geograhpy and molecular geography. Tiffney (1985a, 1985b) considered that disjunction between E. Asia and N. America origin from several modes. For example, pre-Tertiary, hydrophyte, monocotyledon, moss, fern differentiation age; early-Eocene, even-green disjunction , magnolia, camphor and camellia differentiation age; late-Eocene-Oligicene, cold-resistant and seasonal differentiation age; Miocene, deciduous, herbaceous differentiation age; late-Tertiary-Quaternary, the polar region and high mountain differentiation age.

The data from phylogenetics, molecular biology, geology and paleobotany all suggested that the plants distributed between East Asia and eastern North America were relict species that had been flourished in the Northern Hemisphere in Tertiary (Boufford, 1998; Davidse, 1983; Graham, 1972; Raven, 1972, 1974; Thorne, 1972; Wen, 1999; etc.).

(3) Mt. Sanqingshan is a diversiform center of genera disjuncted between E. Asia and N. America, and it has enriched genera of disjunction: Geographically, East Asia and North America was referred to the east of Asia and the east of North America separately in broad sense. Mt. Sanqingshan located at the centre of East Asia. The results show that the highest proportion of disjunction genera in the whole mainly occurred in Central China, and next occurred is in East China (Zhu, 2007)(fig. 1), and we statistics (tab. 1). There are 68 genera disjuncted E. Asia and N. America based on Wu's concept (1993) , 56.2% of the total of this type in China (121 genera; Wu, 1993). Mt. Sanqingshan has enriched genera disjuncted E. Asia and N. America, which is natural conservation bank.

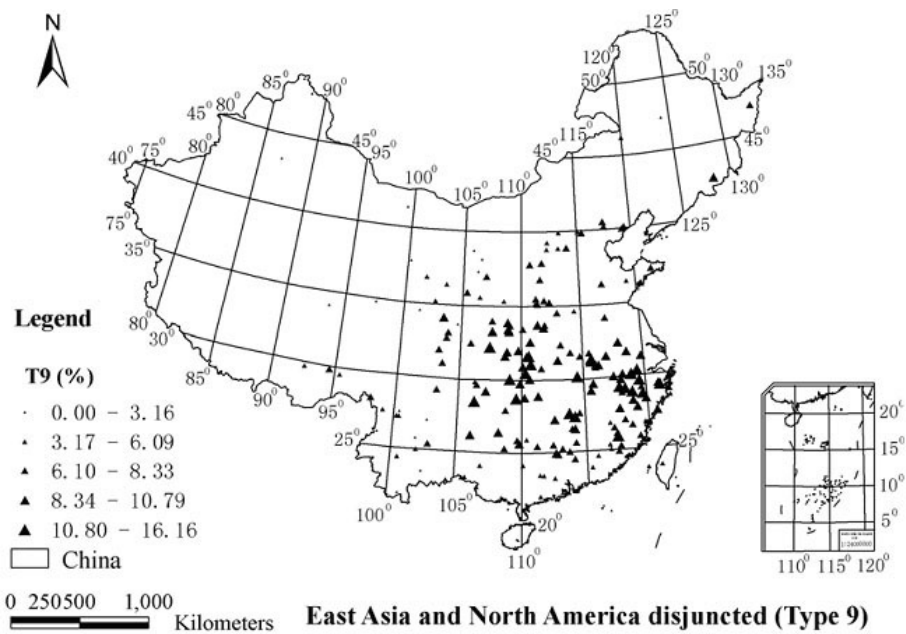


Fig. 1 Distribution of East Asian and North American disjunction genera in China (Ref: Zhu, 2007)

Table 1 Statistics of E. Asian-N. American disjunction genera at different regions in China

| Region | Location | No. of genus | Proportion (%) to total genera in locations respectively |
|-----------------|---|--------------|--|
| Northeast China | Liangshui, Heilongjiang Province, N47°06'E128°47' | 6 | 0.9 |
| | Meixi, Heilongjiang Province, N47°E128° | 19 | 6.2 |
| | Raolihe, Heilongjiang Province, N46°30'E132°21' | 17 | 7.14 |
| | Mt. Changbaishan in Jinlin Province, N40°51'E125°16' | 28 | 8.86 |
| | Mt. Fenghuangshan in Liaoning Province, N40°25'E124°03' | 33 | 8.59 |
| North China | Saihanba in Inner Mongolia, N42°22'E116°53' | 12 | 4.07 |
| | Hunshandake in Inner Mongolia, N41°56'E112°22' | 2 | 0.7 |

| | | | |
|--------------------|--|----|------|
| | Mt. Wutaishan in Shanxi Province, N38°30'E112°50' | 21 | 6.05 |
| | Mt. Laoshan, Shandong Province, N36°03'E120°07' | 32 | 7.13 |
| | Mt. Taiyueshan in Shanxi Province, N36°20'E110°40' | 36 | 7.5 |
| | Mt. South Taihangshan-Mt. Zhongtiaoshan in Shanxi Province, N34°04'E110°02' | 44 | 8 |
| | Mt. West Tianmushan in Zhejiang Province, N30°07'E118°50' | 53 | 7.8 |
| East China | Mt. Huangshan in Anhui Province, N30°10'E118°11' | 58 | 9 |
| | Mt. Lushan in Jiangxi Province, N29°34'E115°50' | 58 | 8.14 |
| | Mt. Wuyishan in Fujian Province, N27°45'E118°01' | 55 | 8.38 |
| | Mt. Shenlongjia in Hubei Province, N31°15'E109°56' | 67 | 8.5 |
| Central China | Lichuan county in Hubei Province, N29°44'E108°21' | 57 | 8.2 |
| | Mt. Mufushan, Hunan Province, N28°53'E113°46' | 57 | 8.15 |
| | Heishiding Nature Reserve in Guangdong Province, N23°27'E111°53' | 23 | 4.0 |
| South China | Mt. Wuzhishan in Hainan island, N18°53'E109°37' | 25 | 2.9 |
| | Mt. Diaoluoshan in Hainan island, N18°40'E109°45' | 23 | 2.3 |
| Northwest China | Kekesu in Xinjiang Province, N47°38'E87°28' | 5 | 2 |
| | Mt. Bogeda in Xinjiang Province, N43°40'E87°34' | 1 | 0.63 |
| | Mt. Helanshan Ningxia Province, N38°40'E105°20' | 3 | 4.3 |
| | Mt. Qilianshan in Qinghai Province, N36°50'E97°35' | 9 | 2.1 |

| | | | |
|--------------------|--|----|------|
| | Mt. Liupanshan in Ningxia Province, N35°15'E106°09' | 21 | 6.95 |
| | Ravines in the upper of Yellow River, N35°20'E100°55' | 18 | 5.11 |
| | Mt. Fanjingshan in Guizhou Province, N49°E108°45' | 22 | 6.6 |
| Southwest China | Mt. Omeishan in Sichun Province, N29°30'E103°20' | 18 | 13.2 |
| | Mt. Wuliangshan in Yunnan Province, N24°E100°25' | 22 | 2.3 |
| | Xishuangbanna in Yunnan Province, N21°10'E100°16' | 34 | 3.1 |

(4) The genera disjuncted between E. Asia and N. America, contain a lot of original, relic species, which are important in systematic evolution research: There are 68 genera disjuncted between E. Asia and N. America based on Wu's concept (1993) , accounting for 56.2% of the total of this type in China (121 genera; Wu, 1993). It is more than those of Mt. Huangshan (58), Mt. Lushan (58) and Mt. Wuyishan (55). It is important significance in plant geography, palaeogeology, palaeogeography and palaeoclimate. For example, *Pseudotsuga*, *Tsuga*, *Liriodendron*, *Magnolia*, *Illicium*, *Sassafras*, *Lindera*, *Liquidambar*, *Castanopsis*, *Lithocarpus*, *Mahonia*, *Photinia*, *Hydrangea*, *Nyssa*, *Aralia*, *Stewartia*, *Halesia*, *Pieris* are original woody angiosperm. *Pseudotsuga*, *Liriodendron*, *Magnolia*, etc. are lived fossil. *Liriodendron chinense* and *Liriodendron tulipifera* were considered as a pair of original species in East Asia and North America.

(5) The genera disjuncted between E. Asia and N. America have large area population in Mt. Sanqingshan, and they have relic characteristics: Among genera disjuncted in East Asia and North America, there are abundant ancient taxa in Mt. Sanqingshan, such as *Pseudotsuga gaussenii* forming a dominant community, and covering an area of 100 hm²; *Tsuga tchekiangensis* scatteredly distributed along the west regions in Mt. Sanqingshan, usually accompanied with *Pinus taiwanensis*; *Torreya grandis* mainly distributed in Nanqingyuan and can be a dominant specie in community; *Liquidambar acalycina* distributing along both sides of Yulinguan above 1, 000 m and both sides of near Windgate, and the dominant community covered area 3000 m².

Other species in the disjunction genera, such as *Castanopsis eyrei*, *Castanopsis sclerophylla*, *Halesia macgregorii*, *Stewartia gemmata*, *Hydrangea angustipetala*,

Hydrangea paniculata, are dominant species or frequent species in Sanqingshan. Some important species in disjunction genera in the status of community are described as follows:

a. Pinaceae: The genera *Pseudotsuga* and *Tsuga* of Pinaceae belong to E. Asian and North American disjunction pattern. *Pseudotsuga* distributes on both sides of the Pacific discontinuously. In China, it is mainly distributed at the subtropical mountainous area in the south of Mt. Qinling, and often occurred at the coniferous forests or coniferous and broad-leaved mixed forests in altitude 460-3300 m; In North America, it appears with the zonal distribution along the east coast of the Pacific Ocean.

Systematic status of *Pseudotsuga*: Flous (1936) named some plants of *P. sinensis* distributed in East-China as *P. gaussenii*. Since then, there are different views on the systematic status of *P. gaussenii*. Zheng & Fu accepted it on the basis of morphological characters. Hermann (1982), Li (1993), Fu et al (1999) included it within *P. sinensis*. Fajon (1990, 2001) treated it as a variety of *P. sinensis*. El-kassaby et al. (1983) used discriminant function analysis to show that karyotypes of three putative species *P. sinensis*, *P. gaussenii* and *P. wilsoniana* could be readily distinguished from one another. *Pseudotsuga* is an important genus of Pineaceae with the largest number of species of current conifers, and in an important state in North temperature and sub-tropic coniferous forest. The phylogeny study of *P. gauensii* will promote the intergeneric study of *Pseudotsuga* and the phylogeny study of Pineaceae.

Significance of *Pseudotsuga gaussenii* at biogeography: *Pseudotsuga* is a typical genus distributed across East Asia and North America in subtropical flora. All plants of *Pseudotsuga* in China are endemic species, distributed in subtropical region south of Qinling Mountains. The most widespread specie is *Pseudotsuga sinensis*, distributed in Yunnan, Guangxi, Sichuan, Guizhou, Hubei and Hunan. *P. brevifolia* is the southernmost species, with bad natural regeneration scattered in Longzhou and Yingxi, Guangxi. *P. forrestii* is distributed in coniferous forests of northwest Yunnan, southeast Xizang, and southwest Sichuan. *P. gaussenii* scatters or forms small forest in mountain areas of south Anhui, west-south Zhejiang, Jiangxi and Fujian. *P. welsoniana* is distributed in evergreen broad-leaved forest of central mountain belt of Taiwan. Chinese *Pseudotsuga* shows a crease of vertical distribution from the east to the west. *P. japonica* is the northernmost and easternmost specie in East Asia, distributed in Honsu, Kyushu and Shikoku.

There are 2 species, *P. menziesii* and *P. macrocarpa*, in North America. *P. menziesii* widely disperses in North America, and is a major tree in subtropical coniferous forests in

the west coast of North America. *P. macrocarpa* is narrowly distributed at 200-2400 m in conifer or mixed forests of southwest California. *Pseudotsuga gaussenii* is one of state second-grade protective plants, endemic to centre of subtropical zone. It is not a predominant specie but in endangered state. In Mount Sanqingshan, *Pseudotsuga gaussenii* disperses in a large area and forms prominent communities in some area. Those communities are rare and relic, more than hundreds of hectares in the area, and could be the largest one in China or even in East Asia.

The fossil of *Pseudotsuga*: The fossils of *Pseudotsuga* were firstly found at the Oligocene stratum in Oregon of North America (Florin, 1963). There are many fossils of *Pseudotsuga* in Japan, but the credible fossils have not been found in other regions in Asia, Europe and eastern North America. Some people considered that *Pseudotsuga* was originated from ring-Pacific regions, or Asian regions, but which lack of enough evidences (Li et al., 1993). The research based on DNA data showed that the relationship of *Pseudotsuga* plants in Asia and those of North America was not close, i.e. East Asia and North America were two independent differentiation centers respectively, but their origin places are still not clear (Li, 2006). That assembling distribution of *Pseudotsuga gaussenii* found in Mt. Sanqingshan would be excellent materials for further researching on their origins.

***Pseudotsuga* is a typical genus distributed across East Asia and North America in mid-subtropical flora:** In East Asia, because each species is limited in number, distributed dispersedly and with bad propagation, the communities of *Pseudotsuga* are relic even though there are several species. The communities in Mount Sangqingshan represent the evolutionary history of *Pseudotsuga*, and with its corresponding *Pseudotsuga* in North America, they confirm the close relationship between East Asia and North America. The study on *Pseudotsuga* in Mount Sanqingshan will promote the research of *Pseudotsuga* on phylogenetic development and biogeography, and is significant for researches on phylogeny, evolution, floristic geography of Pinaceae and even for researches on systematic phylogeny and biogeography of gymnosperm. And it proves the changes of geology, palaeogeography and is of worldwide significance for the study of biogeography and biosystematics. And the study of *Pseudotsuga* which belongs to relic plants will also give more knowledge of the time and the way of plants exchanging in the northern hemisphere, and floras forming and exchanging in East Asia and North America.

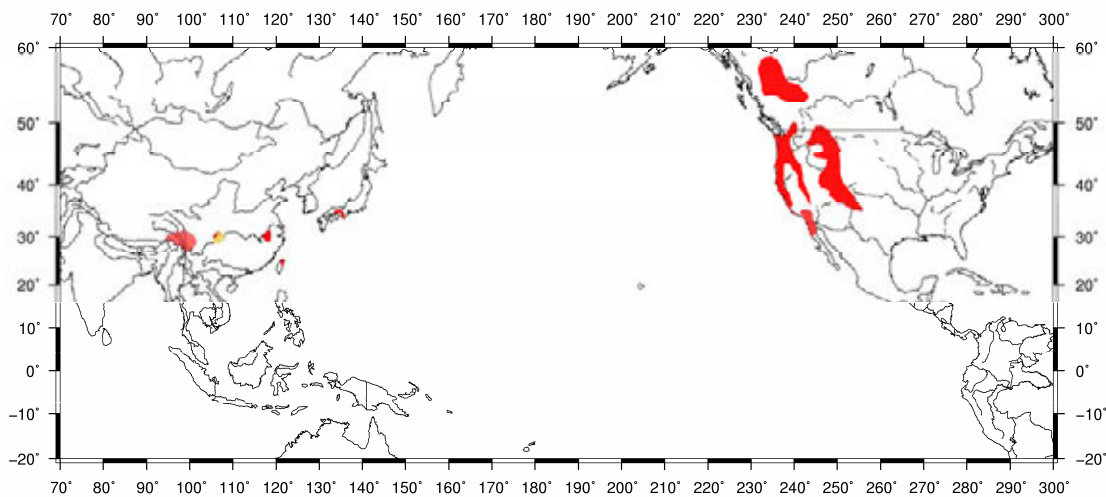


Fig. 2 Distribution of *Pseudotsuga* (Ref.: Li, 1972; Hong, 1993; Li, 1993)

The genera *Tsuga*: The fossils of *Tsuga* were found from late Cretaceous to late Tertiary strata in North America and Eurasia, showing that *Tsuga* had ever distributed in North America and Eurasia widely. Now this genus is centralized in East Asia and North America. Among them, 5 species distribute from Himalayas to southern Qinling of China, and Japan, and other 4 species in east coast of Pacific and eastern North America (Fig. 3). The first fossils of *Tsuga* were found in early Cretaceous stratum of East Europe. Some evidences show that *Tsuga* came into North America from West Europe through the land-bridge connected North America and Europe (Ben, 2003). In the high altitude area of north Wanshouyuan, south Mt. Sanqingshan, “*Tsuga chinensis* + *Cyclobalanopsis myrsinaefolia* + *Fokienia hodginsii* --*Juniperus formosana*” community is there. There are 15-20 *T. chinensis*, and the largest one is 10 m tall and 30 cm in diameter. The community, including *P. gaussenii*, *T. chinensis*, *Cyclobalanopsis multinervis*, *Eurya saxicola*, is located in Fengmen-Sanqingong near to Well Luquan. It is evergreen with orderly canopy. The tree layer is divided into three layers: the prominent species in the first layer are *Pinus taiwanensis* and *P. gaussenii*. Most plants of the latter are tall over 20m, and the largest one is 30 m tall and 320cm in diameter.

b. Taxaceae: Taxaceae is another interesting group. It has 5 genera and distributes from Eurasia to sub-arctic of North America to Center America and subtropic, even tropic regions of southeast Asia. *Torreya* is a disjunction genus between East Asia and North America, with 2 species in North America, 1 species in Japan, 4 species in China. There is one species in Mt. Sanqingshan. Taxaceous genus *Torreya* are evergreen trees, with 7 species; 4 in China, distributed from southwest of China to east China. Only 1 species, *Torreya grandis* in Mt. Sanqingshan, grows well and forms large synusia in local area,

even forms a typical community in the Giant Python Valley to Yuhuangding of Mt. Sanqingshan.

c. Magnoliaceae: Magnoliaceae is a immemorial and natural group on the systematic evolution. The fossils of Magnoliaceae were found in the early Cretaceous, or even earlier, from Kangdian old land, i.e. included southwest Hengduan Range, south Sichuan, north Yunnan (Liu, 1995). Magnoliaceae contains 240 species of 15 genera, mainly distributed in southeastern and southern Asia, and southeastern North America. Among them, 12 genera are endemic to East Asia, and 3 genera are endemic to China. In China, with 12 genera and more than 200 species, it is centered in Southwestern to Southern. And *Liriodendron* and *Magnolia* is disjuncted in East Asia and North America. There are two species in *Liriodendron*, one is from south of Yangtze River to northern Vietnam, which has some primitive characters; another is from southeast of North America, which has some evolution characters (Fig. 3). By using molecular and biological methods, it is estimated that the differentiation between two species has begun 10 my ago (Wen, 1999). *Liriodendron chinesisne* distributes in Mt. Wuyishan, Mt. Lushan and Mt. Huangshan, and the wild population may be existed in Mt. Sanqingshan.

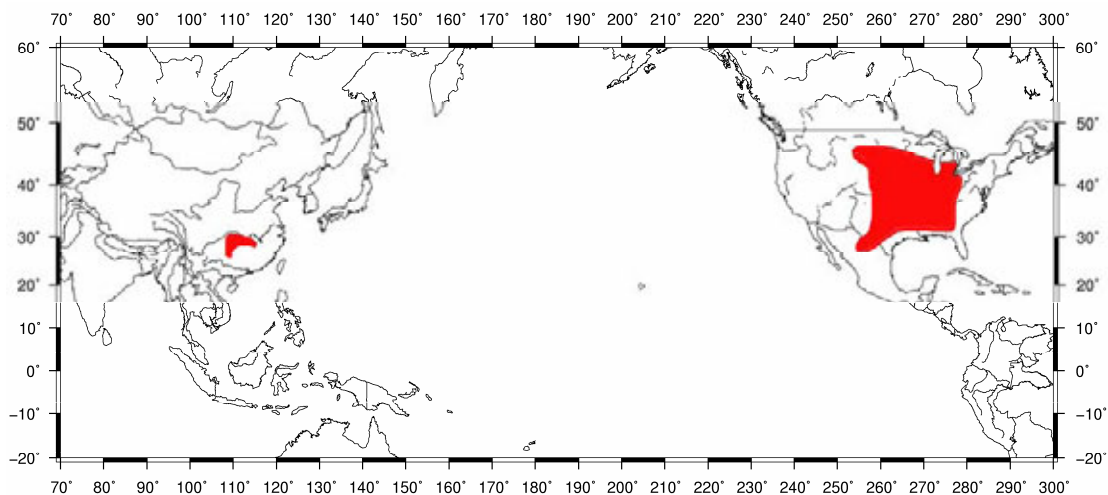


Fig. 3 Distribution of *Liriodendron* (Ref.: Liu, 1995)

***Magnolia*:** about 90 species, is the largest genus in Magnoliaceae, and distributes mainly at the temperate and tropical areas in southeast of Asia (Fig 4). And they center in Yunnan, Guangxi and Guangdong of China, these areas may also be the origin center (Liu, 1995). According to DNA molecular clock calculations, species of East Asia and North America were divided 4.1-5.5 million years ago (Wen, 1999). Mt. Sanqingshan has five species of *Magnolia*.

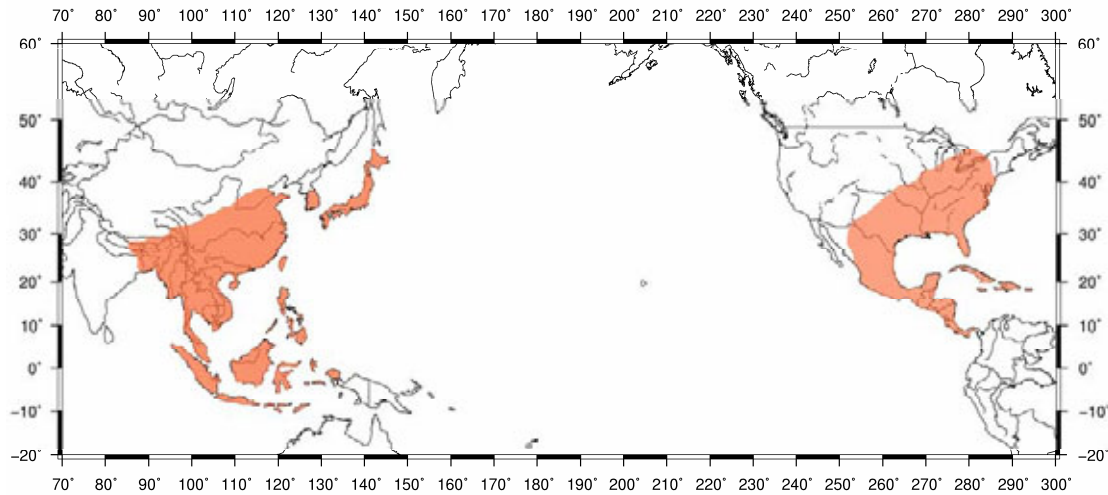


Fig. 4 Distribution of *Magnolia* (Ref.: Liu, 1995)

d. Hamamelidaceae: An ancient and complex group, with 28 genera and 130 species, and many of them belong to relict species. They were usually divided into six subfamilies with relative isolated by relationship. Most of Hamamelidaceae are distributed in Asia. China has nearly 80 species in 18 genera. 3 genera, 8 species are distributed in North America. And *Liquidambar* and *Hamamelis* belong to East Asia and North American disjunction distribution.

***Liquidambar*:** 5 species. Among them 2 species in China, 1 in Japan, 1 in Asia Minor, and 1 species in North America(fig. 5). Fossils of *Liquidambar* distributed at the Cretaceous or Tertiary stratum in north Europe and North America. There are 2 species of *Liquidambar* in Mt. Sanqingshan. The genus *Liquidambar* of Hamamelidaceae is a deciduous tree, with 5 species, and 2 species in China, *Liquidambar formosana* and *L. acalycina*, which distributed from west to Taiwan, China; and other 3 species in North America. *L. formosana* distributed in low altitude area of Sanqingshan, and *L. acalycina* distributed in high altitude area of east Mt. Sanqingshan. The vertical structure of *L. acalycina* community can be divided into 3 layers, the first layer mainly composed of *L. acalycina*, 20-25 m high; and second layer mainly composed of *L. acalycina*, *Cyclobalanopsis myrsinifolia*, *Rhododendron simiarum*, *Cyclobalanopsis multinervis*, about 13-20 m high, sometimes *Pseudotsuga gaussenii* and *P. taiwanensis* occur among them; the third layer mainly composed of *Rhododendron simiarum*, *Camellia chekiangoleosa*, and *Neolitsea phanerophlebia*, about 8-13 m high.

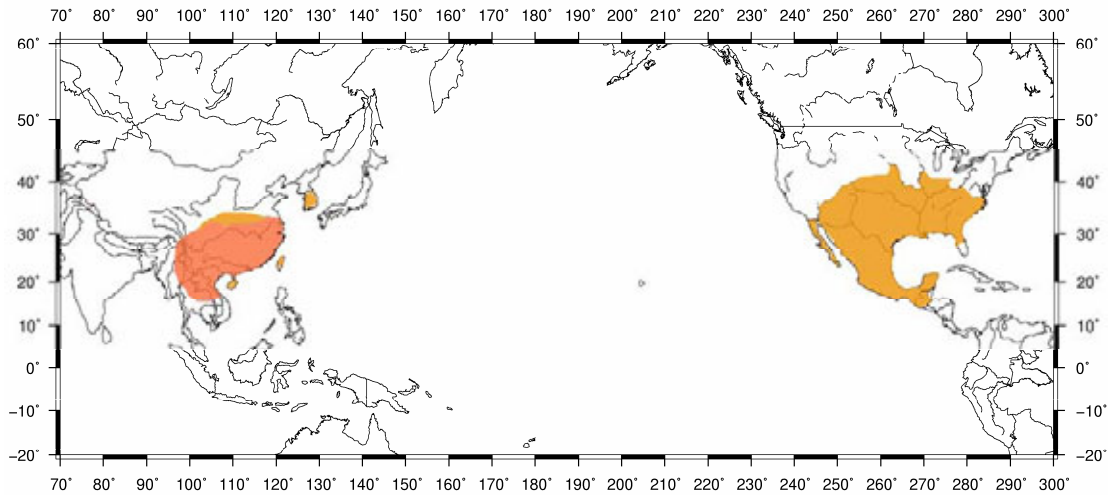


Fig. 5 Distribution of *Liquidambar* (Ref.: Zhang, 1995)

e. Theaceae: About 28 genera 700 species in this family, widely distributed in the tropical and subtropical area, especially in Asia. China has 15 genera, 4 of them are endemic to China, and 3 are endemic to East Asia. *Gordonia* and *Stewartia* are disjunction genera of East Asia and North America (Fig. 6)

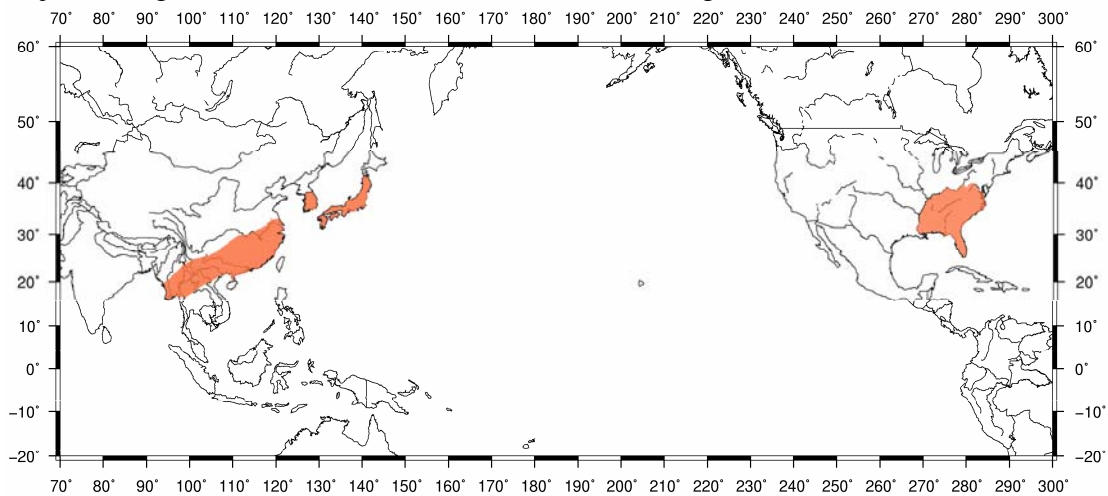


Fig. 6 Distribution of *Stewartia* (Ref.: Li, 1995)

***Stewartia*:** 13 species, mainly distributed in the subtropical regions of East Asia. Only 2 species in the subtropical regions of eastern North America. Based on the fossil data, *Stewartia* had distributed widely in the entire Laurasia before Tertiary, included Eurasia to North America (J. Li, 1996). The $\frac{3}{4}$ species of *Stewartia* distributed in China, which concentrated in the southern and western China, including some primitive taxa, and other advanced taxa, so J. Li (1996) considered the southern and southwestern China are the origin and differentiation centers of *Stewartia*. Mt. Sanqingshan has 1 species of *Stewartia*. In Mt. Sanqingshan, "*Stewartia gemmata* + *Cyclobalanopsis*

multinervis--*Disanthus cercidifolius* var. *longipes* + *Sycopsis sinensis* ” is a typical community, an evergreen and deciduous broad-leaved mixed forests.

2. Mt. Sanqingshan is extremely high biodiversity, which has important significance in the world.

(1) With rich endemism and a lot of endemic species: The vascular flora of Sanqingshan consists of 1857 species from 775 genera belonging to 38 families, including 213 species of fern from 82 genera of 38 families, 18 species of gymnosperm from 12 genera of 7 families, and 1629 species of angiosperm from 681 genera of 144 families. The special component of flora in Sanqing Mountain is dominant, endemic genera is 751 species, belonged to 321 genera, 88 families, accordingly, the relevant ratio of endemic genera in Mt. Sanqingshan presents as follows: families accounting for 21.6 %, genera accounting for 6.2%, and species accounting for 3.2%.

According to specimens, our investigation and related reference, the study showed that in Mt. Sanqingshan there are 4 families endemic to East Asia, 3 families endemic to China, 20 genera endemic to China, and about 311 species endemic to China which belongs to 166 genera of 65 families. Accordingly, in China, there are 19 families endemic to East Asia and 6 families endemic to China (Li X.W., 1996).

Families endemic to East Asia:

a. Cephalotaxaceae: a typical family endemic to East Asia, which distributed in Eastern Himalayas through the Qinling Ranges, to the south of Shandong, and Taiwan, and to Japan. There are 9 species of the world and 1 species, *Cephalotaxus sinensis*, in Mt. Sanqingshan. Fossils of this family were found in Western Europe, North America and Asia, showing that this family was a widespread ancient group. Meanwhile, Cephalotaxaceae is a bridge to link Podocarpaceae which was mainly distributed in the austral paleo-continent and Taxaceae which was mainly distributed in the north paleo-continent (Ying J.S., 1981; quoted from Hua Peng, 1997).

b. Actinidiaceae: This family is one of most developed families endemic to East Asia, including 2 genera, and more than 80 species of the world. There are one genera, and 7 species distributed in Mt. Sanqingshan, i.e. *Actinidia melanandra*, *Actinidia lanceolata*, *Actinidia eriantha*, *Actinidia chinensis*, *Actinidia callosa* var. *henryi*, *Actinidia latifolia*, and *Actinidia arguta*. The family centered by the wide Chinese subtropical regions from the south of Qinling Ranges, the east of Hengduan Ranges. Although the family was included in the Ericales, its origin was considered to be closer to the Theaceae (Liao

W.B., 1992).

c. Stachyuraceae: There is only one genus and about 10 species in this family, which are mainly distributed from Himalayas to Japan. There is 1 species, *Stachyurus chinensis*, in Mt. Sanqingshan. This family was considered to be relative with Flacourtiaceae, however, according to the structure of seed, this family is closer to Theales

d. Helwingiaceae: There are only one genus and 8 species in this family. These species are mainly distributed from Himalayas to Japan. There is one species, *Helwingia japonica*, in Mt. Sanqingshan. Usually, this family is also united under family Cornaceae.

Families endemic to China:

a. Ginkgoaceae: Only 1 species of 1 genus exists in Ginkgoaceae, and only distributed in China now. Ginkgoaceae is one of the oldest groups in the existing spermatophytes and one of the Mesozoic relict plants. From Mesozoic age, at least 6 genera of Ginkgoaceae were extinct, while their fossils occurred in Carboniferous, Permian, Triassic and Jurassic strata. Beforetime, the majority of botanists considered that the wild ginkgo distributed only in Mt. Tianmushan in west Zhejiang. However, in this field investigation, we found a “Big Ginkgo” (60 cm in diameter at the heart height, up to 20 meters in height) in Mt. Sanqingshan, and a few big ginkgo trees around the valley.

b. Sargentodoxaceae: This family is monotypic, i.e. *Sargentodoxa cuneata*, which is dioecious or bisexual, with up to 30 carpels. It is a very primitive woody liana, related with family Lardizalaceae, was considered as one of most primitive angiosperm. It mainly distributes from Qingling Ranges to the east, south, southwest of China, Hainan, and its south boundary extending to the north of Indo-China peninsula. Qu S.C. (1986) has published a new species of the genus *Sargentodoxa*, namely *S. simplicifolia*, which was considered as a new differentiation of Sargentodoxaceae, in subtropical regions in China. However Shi J.X. et al., (Shi et al., 1991) considered that pollen morphology and chromosomes have no any differences between the two species, so *Sargentodoxa simplicifolia* could be accepted as a new species. Based on recent analysis on molecular data of *Sargentodoxa cuneata*'s populations from different province (Guangdong, Guangxi, Hunan, Shaanxi, Anhui) (Liao W.B. et al., 1999), the results showed that the range of morphological variability of all groups are consistent, but at the molecular level, there are obvious differences, and related with geographical distribution regions, and showed a certain regional differentiation disciplinarian. Thus, with this primitive groups spreading, their genetic structure could be vary with the differences of specific natural condition, which may be one of the main reasons that causes the species

evolution.

c. Eucommiaceae: This family is monotypic i.e. *Eucommia ulmoides*, which is unisexual, dioecious and no perianth. Fossils of Eucommiaceae have been found in Miocene strata in Europe, and in Eocene strata in China and Japan. A large quantity of small fossils was found in western North America (Mt. Rocky region). Now *Eucommia ulmoides* distributes in the central, north, northwest and southwest China and lives in the low valleys, forests at the altitude of 200-1740 m.

(2) Species diversity and endemic species in animals: In the aspect of insects, there are 1246 definable species, belonged to 852 genera, 173 families and 18 items. Mt. Sanqingshan possesses 172 species of butterflies, totaling for 97 genera, 172 species, far in excess of Mt. Huangshan, 105 species and 75 genera. There are 69 species shared by the two mountains, accounting for 65.7% of butterflies in Mt. Huang, and only 40.4% in Mt. Sanqingshan.

For amphibian, 24 species are recorded, which belonged to 7 families and 2 items, accounting for 61.5% of species in Jiangxi, which are 39 species. Among these, 11 species are endemic to China, accounting for 45.8% of the total species; recorded reptiles are 31 species, belonged to 7 families and 2 items, accounting for 38.8% of species in Jiangxi, which are 80 species, and accounting for 63.2% of species on record in the northeastern hills of Guizhou Province, which are 49 species. 6 of which are endemic to China, accounting for 19.3% of total numbers of reptiles.

There are abundance birds in Mt. Sanqingshan. The investigation recorded 207 species, belonged to 48 families and 17 items, accounting for 49.1% of the total number of species in Jiangxi Province, which are 422 species. There are 11 species are endemic to China, accounting for 11.0% of the total number of species in China. *Seicercus affinis intermedius* is endemic subspecies of Eastern China.

Mammals are also abundant in Mt. Sanqingshan. The investigation recorded 48 species from 19 families of 8 items, accounting for 45.7% of total species (105 species) in Jiangxi Province. There are 8 endemic animals of China, which are distributed mainly in China, accounting for 16.7% of total numbers of mammals.

(3) Important Rare and Endangered Species and their Values: There are 49 rare or endangered species and relic species regarded as the state key protected plants, which belongs to 40 genera of 28 families. Among them, 10 threatened species, including 2 endangered and 8 vulnerable species, are listed in The 2006 IUCN Red List of

Threatened Species; 47 threatened species are listed in China Species Red List, including 4 endangered plants and 43 vulnerable plants; 22 are state key protected plants (2 Grade I protected species, 20 Grade II protected species).

a. *Ginkgo biloba* Linn.: Its ancestor could occur about 270 million years ago. Up to about 170 million years ago, *Ginkgo* almost spread all over the world. But in Quaternary, most *Ginkgo* died, only few were preserved as living fossils in a small area of China. Thus they considered the rare treasures, liked Giant Panda (*Ailuropoda melanoleuca*). Beforetime, the majority of botanists considered that the wild ginkgo distributed only in Mt. Tianmushan in west Zhejiang. However, in this field investigation, we found a “Big Ginkgo” (60 cm in diameter at the heart height, up to 20 meters in height) in Mt. Sanqingshan, and a few big ginkgo trees around valley.

b. *Pseudotsuga gaussenii* Flous: Please refer to the mentioned. It is also an important living fossil and relict species.

c. *Pseudotaxus chienii* (Cheng) Cheng: *Pseudotaxus chienii*, state Grade II key protected plants, is a relict species of Tertiary. It is also species endemic to China and belongs to a monotypic genus. At an elevation 1169 m in Mt. Sanqingshan, about 10 m to touring route from Fengmen to Sanqing Temple, we could find a typical *Pseudotaxus chinensis* community, covering an area of about 1500 m², and , it is occasionally distributed in other places.

d. *Disanthus cercidifolius* subsp. *longipes* (Chang) K.Y. Pan: The genus *Disanthus* is a rather important taxon in systematics. It belongs to family Hamamelidaceae, and it is usually considered as one of the most primitive groups in angiosperm evolution history. It is a relict species in monotypic genus, State Grade II key protected plants. The genus *Disanthus* is with two geographical sub-species, *D. cercidifolius* subsp. *cercidifolius* is endemic to Japan, and *Disanthus cercidifolius* subsp. *longipes* is endemic to China, they also are two vicarious sub-species in Sino-Japanese floras, and this phenomenon is useful to study Hamamelidaceous phylogenetic and phyto-geography of East Asia. *Disanthus cercidifolius* subsp. *longipes* is mainly distributed in the Jinnu Touring Route, from the foot of Gigantic Python to the valley of Jinsha village.

e. *Taxus wallichiana* var. *mairei* (Lémeé et Lév.) L. K. Fu & Nan Li: *Taxus chinensis* var. *mairei*, state Grade I key protected plants, is a species endemic to China, and relict species of Tertiary. Plants contain alkaloids, which is the main raw material for anti-cancer drugs; seeds contain oil; and bark contain tannins. It spreads mainly in the

south of the Yangtze River drainage area, also in Guizhou.

In Mt. Sanqingshan, it is mainly scattered distributed in the forests below 1000-1500 m. At the foothill, near Fenshui, there is a tree with 80 cm in diameter and up to 15 m.

f. *Juglans cathayensis* Dode: The juglans, a species of Juglandaceae, it has been listed as an endangered species in “China Red List Species”. Distributed widely in the majority of regions in China, West Asia, Central Asia, South Asia and Europe.

In Mt. Sanqingshan, it is found in near Yuling Waterfalls.

g. *Torreya grandis* Fort. ex Lindl. : Belonging to Taxaceae *Torreya*, it is a State Grade II key protected plants. Usually spread at mountains, open valleys below 1400 m, in S Jiangsu, Zhejiang, Fujian, S Anhui and Mt. Dabieshan, N Jiangxi, S Hunan, Guizhou (Songtao District). In Mt. Sanqingshan, it is distributed at the valleys, in the elevation 1200-1600 m.

h. *Liriodendron chinense* (Hemsl.) Sarg.: Fossils of *Liriodendron chinense* were found from late Jurassic to Cretaceous and Tertiary. Now only 2 species were living, *L. chinense* distributed in China and another species *L. tulifera* in east USA. And was considered as a typical East Asian and North American disjunction. Distribution: south of Yangtze River in China to northern Vietnam. It could be existed native population in Mt. Sanqingshan.

i. *Magnolia sieboldii* Koch.: *Magnolia sieboldii*, usually named on “Tiannu mulan”, is a deciduous small trees of Magnoliaceae, and Mt. Sanqingshan is its most north boundary, . *Magnolia sieboldii* naturally distributes from south of the Yangtze River to the north of the Great Wall; and mainly distributes in Liaoning, Anhui, Jiangxi, and N Guangxi. And it is the only *Magnolia* plant, which can spread to the northeast of China. It also distributes in North Korea, and Japan. In Mt. Sanqingshan, it scatters above 1, 400 m, rare.

j. *Monimopetalum chinense* Rehd.: Belonging to Celastraceae, it is a State Grade II key protected plants. The distribution area is narrow, currently only found in Anhui and Jiangxi. It is a species endemic to China, belonging to a monotypic genus, and with an important significance for studying phylogeny and geographical distribution of family Celastraceae. In Mt. Sanqingshan, it is scattered in the varies, forests, rare.

k. *Halesia macgregorii* Chun : Belonging to Styracaceae, it is an endemic species to

China, mainly spreads in Zhejiang, Fujian, Jiangxi, Hunan, Guangdong and Guangxi, etc. As an East Asian-North American disjunction genus, *Halesia* has a great value for studying intercontinental disjunction and Styracaceous phylogeny. With the excessive lopping and its reproductive character, it is difficult in regeneration. However, *Halesia macgregorii* is widely spreaded in the Mt. Sanqingshan, along the damp valley, some trees are 30 cm in diameter and up to 20 m in height.

l. *Eucommia ulmoides* Oliver : State Grade II key protected plants, is a species endemic to China, belongs to a monotypic genus. It is used medicinally as an invigorator, a tonic for arthritis, and for reducing blood pressure, mainly distributed in Sichuan, Shaanxi, Hubei, Henan, Guizhou, Yunnan, Jiangxi, Gansu, Hunan, Guangxi, etc. The *Eucommia ulmoides* was cultured in the foot of Mt. Sanqingshan. It is believed that it was transplanted from the mountain, but we still have not found wild population in the survey.

m. *Parakmeria lotungensis* (Chun et C. H. Tsoong) Law : *Parakmeria lotungensis* is an endemic species to China, evergreen big trees. The *Parakmeria* is a genus endemic to China, is characterized by androdioecious, carpels degenerated. So it is useful to the phylogenetic of Magnoliaceae, mainly distributed in Hainan, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Fujian and Zhejiang. In Mt. Sanqingshan, it is relatively rare, scattered distributed only along the Jinnu touring route, near Jinsha Village.

(4) Characteristics of Rare and Endangered Plants in Mt. Sanqingshan:

a. Having a great of ancient and primitive species. *Pseudotaxus chienii* and *Taxus wallichiana* var. *mairei* are typical Tertiary relict species, which belong to Taxaceae of Gymnospermae and have already existed in Jurassic, and developed and multiplied in Tertiary. In addition, some endangered species of Magnoliaceae, which are polycarpous representatives of primitive angiosperms groups, distributed in Mt. Sanqingshan, such as *Magnolia amoena*, *M. cylindrical*, *M. sieboldii*, *M. officinalis* subsp. *biloba* and *Parakmeria lotungensis*. Furthermore, Hamamelidaceae, Eucommiaceae are considered as representatives of the original amentiferous groups, of which *Disanthus cercidifolius* ssp. *longipes* and *Eucommia ulmoides* are the ancient relict species.

b. Having large number of monotypic genera and oligotypic genera. They account for a large proportion in the flora of Mt. Sanqingshan, the majority of them are primitive and ancient genera. The monotypic genera are *Fokienia*, *Emmenopterys*, *Monimopetalum*, *Camptotheca*, *Eucommia*, *Pseudotaxus*, and *Ginkgo*. Except for *Monimopetalum* of Celastraceae being liana, the rest are primitive woody plants; the oligotypic genera also

account for a large proportion, and in those genera such as *Taxus*, *Coptis*, *Disanthus*, *Parakmeria*, *Torreya*, and *Zelkova* have only one species in Mt. Sanqingshan; *Dysosma* and *Chimonanthus* have two species in Mt. Sanqingshan; *Parakmeria* in Mt. Sanqingshan are located in their northernmost boundary in China.

c. Having abundant endemic genera and species to China in the rare and endangered plants in Mt. Sanqingshan. The main monotypic genera, such as *Monimopetalum*, *Camptotheca*, *Eucommia*, *Pseudotaxus* and *Ginkgo*, are endemic to China; the oligotypic genera, such as *Parakmeria* and *Chimonanthus* are endemic to China too. Among 49 rare and endangered plants, 29 species are Chinese endemic ones, accounting for more than half of total rare and endangered species, which are *Ginkgo biloba*, *Pseudotaxus chienii*, *Torreya grandis*, *Coptis chinensis* var. *brevisepala*, *Dysosma versipellis*, *Magnolia officinalis* subsp. *biloba*, *Parakmeria lotungensis*, *Phoebe bournei*, *Disanthus cercidifolius* ssp. *longipes*, *Eucommia ulmoides*, *Camptotheca acuminata*, *Aralia chinensis*, *Halesia macgregorii*, *Emmenopterys henryi*, *Bulbophyllum omerandrum*, *Calanthe graciliflora* and *Pleione bulbocodioides*. Of these, 10 species are narrowly distributed in east China, which are *Pseudotsuga gaussenii*, *Magnolia amoena*, *M. cylindrica*, *Chimonanthus salicifolius*, *Phoebe chekiangensis*, *Sorbus amabilis*, *Monimopetalum chinense*, *Acer pubipalmatum*, *Saussurea hwangshanensis* and *Malaxis microtatantha*.

d. Having rich East Asian-North American disjunction genera. Among the rare and endangered species, there are 7 genera belonging to East Asian-North American disjunction, including *Torreya*, *Pseudotsuga*, *Magnolia*, *Aralia*, *Panax*, *Pieris*, and *Halesia*. Moreover, most of the rare and endangered species in Mt. Sanqingshan are with high distribution density, even becoming to dominant species, such as *Magnolia cylindrica*, *Torreya grandis*, *Pieris japonica*, and *Halesia macgregorii*. Especially *Halesia macgregorii* distributed mainly along the valleys, but *Magnolia cylindrica* and *Torreya grandis* distributed in the higher elevations when *Pieris japonica* in lower elevation.

(5) Rare, endangered and relic animals:

a. In insects, there are national first-grade protected species, *Teinopalpus aureus*, which is rare species and endemic to China, and national second-grade protected specie, *Carabus lafossei*. Furthermore, some quite precious species with high ornamental values also exist here, such as *Troides aeacus*, *Pazala euroa*, *Agehana elwesi*, *Helcyra superba*.

b. There are 55 species of amphibian and 13 species of reptiles assessed as vulnerable species (VU) in China Wildlife Red List, 2 species as nearly threatened species (NT), of

which *Rana tigrina* is national second-grade protected wild animal, and *Pelodiscus sinensis* is assessed as vulnerable species (VU) by IUCN.

c. In birds, there are 23 of national key protected species in Mt. Sanqingshan, in which, 3 of national first-grade protected species; 20 of national second-grade protected species. In the above 23 species, 16 are intrazonal breeding species; 6 species on the hazard by IUCN (1 species of EN, 4 species of VU, 1 species of NT); 12 species are assessed as threatened birds in China Species Red List (4 species for VU, 8 species for NT). Thereinto, 4 species on the hazard by IUCN and 10 species as threatened birds in China Species Red List are the breeding birds in Mt. Sanqingshan

d. In the recorded 48 species mammals in Mt. Sanqingshan, 13 species are treated as national key protected wild animal. Of which, 3 species, *Neofelis nebulosa*, *Panthera pardus* and *Muntiacus crinifrons*, are national first-grade protected wild animal, while the other 10 species, *Macaca mulatta*, *Macaca thibetana*, *Manis pentadactyla*, *Cuon alpinus*, *Selenarctos thibetanus*, *Aonys cinerea*, *Viverra zibetha*, *Viverricula indica*, *Hydropotes inermis*, and *Capricornis sumatraensis* are national second-grade protected wild animal. All other protected animals still have appropriate population size at present except *Panthera pardus* and *Neofelis nebulosa* were not recorded since the 1980s. 12 species of wild mammals are treated as on the hazard by IUCN, *Panthera pardus*, and *Capricornis sumatraensis* as EN, *Cuon alpinus*, *Selenarctos thibetanus*, *Aonys cinerea*, *Neofelis nebulosa*, *Muntiacus crinifron* and *Hystrix brachyura* as VU, *Macaca mulatta*, *Manis pentadactyla*, *Hydropotes inermis* and *Micromys minutus* as slightly threatened. The populations of *Micromys minutus*, which usually were seen in Lingtou Village, are in considerable sizes. 31 species belong to Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and nearly threatened (NT) of China Species Red List, respectively.

3. Mt. Sanqingshan has typical mid-subtropical environment, forming special population and eco-system, and a refuge in the process of bio-diversity evolution, which has important signification in the world.

(1) The significance of histoty plant geography: As early as the late Mesozoic, about 100 million years ago, there were two distinctive vegetational zones in the mainland of the northern hemisphere: one was cretaceous temperate-flora in the north part, and the other was tropical-subtropical flora in the south part. The northern temperate flora of the Cretaceous period distributed in the north of Laurasia based on the analysis of pollen and fossil, and its dominant floristic elements was deciduous broad-leaved trees and shrubs,

such as *Acer*, *Betula*, *Fagus*, *Magnolia*, *Cocculus*, *Lindera*, *Quercus*, *Tilia*. All of above mentioned are widespread in North Jiangxi Province which includes Mt. Sanqingshan. Up to Eocene of Paleogene period, about 60 million years ago, the floral elements in Mt. Sanqingshan included: *Ulmus*, *Cyclobananopsis*, *Celtis*, *Hemiptelea*, *Trema*, *Rhus*, *Abelia*, Magnoliaceae and Rosaceae. Besides, there were country coniferous forests dominated by pinaceae and Taxodiaceae. Up to the late Neocene, about 12 million years ago, Chinese northern boundary of subtropics moved to near 35 degrees north from north to south. In this period, deciduous broad-leaved forest was predominant in Mt. Sanqingshan. And then in Pliocene, the flora was replaced by mixed deciduous broad-leaved evergreen forests. In the Quaternary period, as a result of repeated moving of glacier, large areas of Jiangxi Province were conserved abundant vegetation forms and relict species of tertiary.

(2) Typical and representative of vegetation and plant communities:

a. The vegetation diversification and integrity. Mount Wuyishan, Mount Sanqingshan, and Mount Huangshan are located from south to north in the mid-subtropical evergreen forest zone of China. Mount Sanqingshan is just situated between Mount Huangshan and Mount Wuyishan. The communities own special transition features from south to north sub-tropical zone, forming typical and diverse mid-subtropical forest ecosystem, and characterized by owning dominant floristic elements of both south subtropical and north subtropical evergreen, and coniferous and broad-leaved mix forests. These natural communities are preserved owing to steepness of topography. The main vegetation includes 3 vegetation type-groups, 13 vegetation types, 26 forms and 41 communities (HU Jia-qi et al, 1996; Wu Guo-fang et al, 1988; Cai Fei, 1993; Wang Li-long et al, 2006; also this iconographs) . The dominant species of needle-leaved forests were *Pinus taiwanensis*, *Pinus massoniana*, *Tsuga chinensis* var. *tchekiangensis*, *Pseudolarix kaempferi*, *Pseudotsuga gaussenii*, *Cunninghamia lanceolata*, *Cryptomeria fortunei*, *Taxus wallichiana* var. *mairei*, *Torreya grandis*, *Pseudotsuga chienii*, *Podocarpus nagi*, *Cephalotaxus fortunei*, *Juniperus formosana*, and *Fokienia hodgkinai*. Among them, *Pinus taiwanensis* forest and *Pseudotsuga gaussenii* forest have the largest distribution area.

b. Typical and rare, endangered plant communities. Subtropical evergreen broad-leaved forest, are also called laurisilvae, is the climax vegetation type of the

mid-subtropical zone. The communities chiefly consist of evergreen species, such as species of Fagaceae, Lauraceae, Theaceae, Magnoliaceae, Hamamelidaceae, Elaeocarpaceae and Aquifoliaceae. There is large area of original evergreen broad-leaved forests preserved in Mount Sanqingshan, which consists of four forms groups

c. Typical subtropical evergreen broad-leaved forest: *Stewartia gemmata*, *Disanthus cercidifolius* subsp. *longipes* forests distribute in the valley of Jinnu Route in Mt. Sanqingshan (Fig. 12-5). Dominant trees in a 20 m × 2 m belt consist of *Cyclobalanopsis multinervis*, *Cyclobalanopsis glauca*, *Sycopsis sinensis*, and *Schima superba*; and in shrub layer consist of *Neolitsea phanerophlebia*, *Lindera obtusiloba*, *Rhododendron simiarum*, *Rhododendron latoucheae*, *Pieris polita*, *Cleyera pachyphylla*, etc. Eight species endemic to China or relict species distributed in a small plot, namely *Disanthus cercidifolius* subsp. *longipes*, *Stewartia gemmata*, *Magnolia cylindrical*, *Magnolia cylindrica*, *Torreya grandis*, *Taxus wallichiana* var. *mairi*, *Pseudotsuga chienii*, *Juniperus formosana*, and *Fokienia hodginnii*. The scientific and landscape values of these communities are high because of its antiquity, sparsity and obvious seasonal changes.

d. Typical evergreen and deciduous broad-leaved mountain mixed forest: population of *Pseudotsuga gaussenii*, where the dominant families are Ericaceae, Pinaceae, Theaceae, Fagaceae, Rosaceae, Lauraceae and Aquifoliaceae, at an altitude of 1559m in the east coast and its area is 4000 m². Its tropical distribution genera accounts for 54.1%, temperate genera for 45.9%, and dominant species are mainly temperate genera. According Shannon-Wiener formation, its diversity index accounts for 3.66, between South subtropical evergreen broad-leaved forests and subtropical evergreen broad-leaved forests.

The particularity of *Liquidambar acalycina* community in Mt. Sanqingshan: The dominant and constructive species are very clear in this community; they are mainly *Liquidambar acalycina*, *Cyclobalanopsis myrsinifolia*, *Rhododendron simiarum* and *Cyclobalanopsis multinervis*. The arbor layer is stratified obviously and the uneven surface fluctuates considerably. The dominant species are mainly deciduous ones, such as *Liquidambar acalycina* and *Cyclobalanopsis myrsinifolia*. The forest form is light or

dark green in spring and summer, whereas patchy yellow or yellow in autumn and winter. The canopy density of this community is not uniform, which is high in *Rhododendron simiarum* because of its diatropism growth and abundant leaves, while small in other sites because of the little leaves of *Liquidambar acalycina* though it is big, and also the little leaves of *Cyclobalanopsis myrsinifolia*, *Cyclobalanopsis multinervis* though they are dominant. The arbor layer can be divided into three sub-layers in vertical structure. The first one mainly is *Liquidambar acalycina* with 35 m in maxim height, the second one mainly are *Liquidambar acalycina*, *Cyclobalanopsis myrsinifolia*, *Rhododendron simiarum*, *Cyclobalanopsis multinervis*, scattered with *Pseudotsuga gaussenii* and *Pinus taiwanesis* of 13-20 m in height, and the third one mainly are *Rhododendron simiarum*, *Cyclobalanopsis multinervis*, *C. chekiang-oleosa*, *Litsea elongate*, *Neolitsea phanerophlebia* of 8-13 m in height. The only shrub layer mainly include *Hydrangea paniculata*, *Viburnum sympodiale*, *Prunus campanulata*, *Camellia chekiangoleosa* etc.

e. Mt. Sanqingshan was an important breeding ground of forest birds and stopover site of migratory birds in mainland China. There are 207 species of birds in Mount Sanqingshan, belonging to 48 families and 17 orders, accounting for 49.0% of total birds in Jiangxi province. Of which, 142 species use here as breeding ground, accounting for 68.60% of the total species. Among them, 11 species are endemic to China, including *Seicercus affinis intermedius*, which is an endemic subspecies in the east region of mainland China; and 16 species are the state key protected wild birds; 4 species are IUNC threatened birds; 10 species are threatened birds in China Species Red List. Additionally, among 207 birds, 103 species are migrating birds, accounting for 49.8%.

It indicates that Mount Sanqingshan is an important breeding ground for birds, and an important inhabit and stopover station of migrated birds in the east of mainland China. It is an important area for protecting species and habitat diversity, especially for rare, endangered and endemic birds.

4. With international value, Mt. Sanqingshan is an important junction zone of biota in the east of Asian continent.

(1) As a bridge communicating the floras of Jiangnan Old Land and Cathaysian Old

land. Mount Sanqingshan locates in the junction between Jiangnan Old Land and Cathysian Old Land. Serving as a bridge between the two Old Land, it owns characteristics of the floras of Mount Huangshan-Mount Lushan originated from Jiangnan Old Land, and of the floras of north Fujian-south Zhejiang originated from Cathysian Old Land. The two floras influence each other (Map. 1) . Some floristic elements can only be found in the south of Mount Sanqingshan but not in Mount Huangshan and Mount Lushan. For example, as a floristic geographical northern boundary, we can find some typical elements, such as *Fokienia hodginsii*, *Ficus formosana*, *Rhododendron simiarum*, *Elaeocarpus decipiens* and *Malaxis microtatantha* in Mount Sanqingshan. On the other hand, some floristic elements can only be found in the north of Mount Sanqingshan but not in the south of Zhejiang province and the north of Fujian province. For example, as a floristic geographical southern boundary, *Polygonum dissitiflorum*, *Thyrocarpus glochidiatus*, *Carex siderosticta* can be found in Mount Sanqingshan.

(2) The key region of *Ginkgo-Pseudotsuga* flora: According to Floristic Regionalization of China Floras (1996) edited by Wu Zhengyi, Mount Sanqingshan is situated in the border between south Zhejiang province and south Jiangxi-east Hunan province, and its flora owns characteristics of both sub-regions'. As to the origin and evolution of floras, the flora of East China included Mount Sanqingshan and its neighboring areas, which could be named as *Ginkgo-Pseudotsuga* flora, characterized by a lot of typical elements, e.g. *Ginkgo biloba*, *Pseudotsuga gaussenii*, *Cyclocarya paliurus*, *Fokienia hodginaii*, *Pinus taiwanensis*, *Disanthus cercidifolius* subsp. *longipes*, *Eucommia ulmoides*, *Magnolia cylindrica*, *Hamamelis mollis* (Mount Huangshan) , *Liriodendron chinense* (Mount Wuyishan) . It is similar to *Metasequoia* flora of China mentioned by Dr. Hu S.Y. in 1980, originated and evolved from an antiquity flora

(3) It is important significance for studying the transitional zone and regionlization of insect fauna between Palaeartic and Oriental. Distributing patterns of insect species and genera are related to the floral characters. Analyzing with dynamic distribution, Palaeartic species basically distributed from north to south, Oriental species conversely from south to north. In zoogeography, China spans over both geographic distributions of animals of Palaeartic and Oriental. The west was divided distinctively

into two parts by Himalayas, where insects were comparted obviously. Because of the absence of natural barrier in the east, species of the two districts can be interpenetrating and be found in the boundary areas. Therefore, there are Palaeartic species in the near north borderline of Oriental district, while some Oriental species diffused to the near south borderline of Palaeartic district. Mt. Sanqingshan almostly locates near the boundary of Palaeartic and Oriental district, and contains not only Oriental species and common species, but also some quantitative Palaeartic species. In zoogeography, there is no controversy that the boundary of Palaeartic Region and Oriental Region is Himalayan mountains in west. However, the eastern boundary between the two regions is under endless controversy. The animal fauna of Mount Sanqingshan contains high proportion of Palearctic and Oriental species because the mount is located near the eastern boundary, which will be terribly significant for ensuring the science of boundary between the two animal fauna regionalization.

(4) The importance of the impaction of Quaternary glaciers to modern animal faunas for Mt. Sanqingshan. In Chinese animal geographical regionalization, Mount Sanqingshan belongs to the hill land of Northeast Jiangxi, east hill-plain sub-region, Center China region, Eastern Ocean Kingdom. The terraneous vertebrates of Eastern Ocean Kingdom are predominant. Among them, amphibians from Eastern Ocean Kingdom account for 86.36%, reptiles from Eastern Ocean Kingdom account for 80.00%, mammals account for 68.75%. Because of flying migration habit, birds have strong spreading capability, accordingly, birds of Eastern Ocean Kingdom in Mount Sanqingshan only account for 55.1%. However, breeding birds of Eastern Ocean Kingdom account for 79.58% in Mount Sanqingshan. The results indicate that Sanqingshan is a favorable region of living, acclimatizing and expanding for many species from four major types of animals. The formation of modern animal fauna is greatly implicated by Quaternary glaciers. Currently, quaternary glaciers are known in Poyang Lake, Mount Lushan and Mount Dagu that are located near Mount Sanqing. Therefore, Mount Sanqing is an ideal site to study the impaction of quaternary glaciers to modern animal fauna.

(5) Mount Sanqingshan is an important distribution and differentiation center of *Paa spinosa* group. There are 103 species of frog in China, and 13 of them were found

in Mount Sanqingshan. There were only 3 species in *Paa spinosa* group, i.e. *Paa spinosa*, *Paa exilispinosa* and *Paa jiulongensis*, all of them were distributed in Mount Sanqingshan. Both *Paa spinosa* and *Paa jiulongensis* are common in Mount Sanqingshan, and *Paa spinosa* is one of dominant species in Mount Sanqingshan; *Paa exilispinosa* is rare in Mount Sanqingshan. Besides in Mt. Sanqingshan, the above three species are also distributed in Mt. Wuyishan. Those indicate that Mt. Sanqingshan and Mt. Wuyishan may be a distribution and differentiation center of *Paa spinosa* group.

5. Comparing with the others natural heritages in China, Mt. Sanqingshan has irreplaceable values.

In the east Asia, China main natural heritage as follows: Taishan Mountain 1987 cultural and natural heritage, Mt. Huangshan 1990 cultural and natural heritage, 1992 Jiuzhaigou Valley Scenic and Historic Interest Area, Huanglong Scenic and Historic Interest Area, Wulingyuan Scenic and Historic Interest Area natural heritage, 1996 Mt. Emei and Leshan Giant Buddha cultural and natural heritage, 1999 Mt. Wuyishan cultural and natural heritage, 2003 Three Parallel Rivers of Yunnan Protected Areas natural heritage, 2006 Sichuan Giant Panda habitat natural heritage, 2007 China Southern Karst natural heritage. Differing from the above mentioned in China, Mt. Sanqingshan owns its characteristic and merits with the natural heritage.

(1) Comparing with Mt. Taishan Natural Heritage of World: Mt. Sanqingshan has more species in plant diversity and endemic plants. Mt. Sanqingshan has two thousand species, but Taishan Mountain has the half species of Mt. Sanqingshan. Taishan Mountain belongs to the temperate floral, but Mt. Sanqingshan belongs to the typical subtropical flora. Forest coverage in Mt. Sanqingshan is larger than Taishan Mountain.

(2) Comparing with Wolong Natural Heritage of World: This place conserves main rare animals panda. They are all global biological diversity conservation areas, but they have differences floral elements. Wolong Nature Reserve is mainly temperate flora, but Mt. Sanqingshan is typical subtropical floristic elements. Furthermore, Mt. Sanqingshan has more species than Wolong Nature Reserve. Mt. Sanqingshan has 2373 higher plants, but Wolong Nature Reserve only has 1989 species. Mt. Sanqingshan has 20 endemic

genera, but Wolong Nature Reserve has 6 endemic genera. Mt. Sanqingshan has 64 East Asian-North American disjunction genera, but Wolong Nature Reserve only has two. So the potential value for science research is better than Wolong Nature Reserve.

(3) Comparing with China Southern Karst Natural Heritage of World: China Southern Karst has typical limestone plants, and the eco-environment is more friable, and is easily interfered. However Mt. Sanqingshan is granite mountain, and the vegetation types are more abundant, and eco-environment are more stable. The plants in China Southern Karst have disjunctive distribution areas, but in Mt. Sanqingshan the plants have continuous distribution. There are lots of small environments in China Southern Karst, so the species are abundant. However the habits are special, so species have not stability. The endemic species in Mt. Sanqingshan have more stability. The rare and endangered species in China Southern Karst have narrow distribution, and the pupations numbers are smaller than in Mt. Sanqingshan. Plants in China Southern Karst grow slowly and the biomass is small. Furthermore, the plants are calciphilia plants. But the rare and endangered species in Mt. Sanqingshan grow fast and the biomass is larger, the adaptabilities are strong.

(4) The differences among Mt. Sanqingshan, Mt. Wuyishan, Mt. Huangshan: The three mountains locate closely. But in the biodiversities, especially vegetation compositions and special species compositions Mt. Sanqingshan has obvious prominent characters. In vegetation compositions, Mt. Sanqingshan has more abundant coniferous trees than Mt. Huangshan and has typical broadleaf trees with Mt. Wuyishan.

a. Mt. Sanqingshan has abundant gymnosperm, a natural gene bank and ecology heritages of southern coniferous tree. All three mounts have all evergreen coniferous forests mainly as *Pinus taiwanensis* and *Pinus massoniana* forest, and have abundant southern taxodi- pines plants. Taxodi- pines plants are composed of some genera which distribute in wide place in south of China as *Tsuga*, *Pseudotsuga*, *Keteleeria*, *Cathaya* etc. Except that, forests have some south genera in Taxaceae, Cephalotaxaceae, Cupressaceae. So we consider these forests as southern taxodi- pines forest and southern coniferous forest. The species and poputions in southern coniferous forest are abundant, and they always grow with *Pinus taiwanensis*, coniferous and broadleaved mixed forest and

evergreen deciduous mixed forest. The common species are *Pseudotsuga gaussenii*, *Tsuga chinensis* var. *tchekiangensis* in Pinaceae , *Taxus wallichiana* var. *mairei*, *Pseudotaxus chienii* in Taxaceae, and *Cephalotaxus sinensis*, *Cephalotaxus forunnei* in Cephalotaceae. Comparing with the others mountains in southern taxodi- pines plants, Mt. Sanqingshan is abundant in these.

b. Mt. Sanqingshan has typical characters of the mid-subtropical evergreen broad-leaved forest. The dominant species and constructive species of the mid-subtropical evergreen broad-leaved forest communities are composed of the characteristic families which are Fagaceae, Lauraceae, Theaceae, Magnoliaceae, Hamamelidaceae, Ericaceae, Aquifoliaceae, Symplocaceae, Rosaceae. In these families, Mt. Sanqingshan has distinct dominances and particularities.

c. Mt. Sanqingshan has a larger area of rare communities with abundant endemic species to China. The communities of *Pseudotsuga gaussenii* and *Disanthus cercidifolius* are enriched in Mt. Sanqingshan, but Mt. Wuyishan and Mt. Huangshan are empty.

Annex:

Table 2 E. Asian and N. American disjunction genera in Mt. Sanqingshan (SQS)

| No. | Genus | Family | Habit | No. in Mt. Sanqin gshan | No. in E. China (% of SQS in E. China) | No. in China (% of SQS in China) | No. in the world (% of SQS in the World) |
|-----|---------------------|----------------|-----------------|-------------------------|---|----------------------------------|--|
| 1 | <i>Abelia</i> | Caprifoliaceae | Shrubs | 2 | 3 (66.7) | 9(22.2) | 30 (6.67) |
| 2 | <i>Acorus</i> | Araceae | perennial herbs | 3 | 4 (75.0) | 4(75.0) | 4(75.0) |
| 3 | <i>Aletris</i> | Liliaceae | perennial herbs | 2 | 3 (66.7) | 13(15.4) | 15(13.30) |
| 4 | <i>Amelanchi er</i> | Rosaceae | trees/shrubs | 1 | 1 (100.0) | 2(50.0) | 25(4.0) |
| 5 | <i>Ampelopsis</i> | Vitaceae | Lianas | 6 | 15(40.0) | 18(33.3) | 30(20.0) |
| 6 | <i>Amphicarp</i> | Papilionaceae | twining | 1 | 1(100.0) | 3(33.3) | 10-15(6.7-1 |

| | | | | | | | |
|----|---------------------------|---------------|-----------------------------|----|-----------|----------------|----------------|
| | <i>aea</i> | | herbs | | | | 0) |
| 7 | <i>Antenoron</i> | Polygonaceae | perennial herbs | 2 | 2(100.0) | 2(100) | 4(50.0) |
| 8 | <i>Apios</i> | Papilionaceae | twining herbs | 1 | 2(50.0) | 6(16.7) | 10(10.00) |
| 9 | <i>Aralia</i> | Araliaceae | small trees | 5 | 13(38.5) | 30(16.7) | 25-40(12.5-20) |
| 10 | <i>Astilbe</i> | Saxifragaceae | perennial herbs | 2 | 3(66.7) | 15(13.3) | 25(8.00) |
| 11 | <i>Berchemia</i> | Rhamnaceae | erect/climbi ng shrubs | 3 | 8(37.5) | 16(18.75) | 22(13.6) |
| 12 | <i>Brachyelyt rum</i> | Gramineae | perennial herbs | 1 | 1(100.0) | 1(100) | 3(33.30) |
| 13 | <i>Campsis</i> | Bignoniaceae | Trees | 1 | 1(100.0) | 1(100) | 2(50.00) |
| 14 | <i>Castanopsi s</i> | Fagaceae | trees/shrubs | 11 | 16(68.75) | 63±(±17.5) | 122±(±9.02) |
| 15 | <i>Cephalant hus</i> | Naucleaceae | shrubs/small trees | 1 | 1(100.0) | 1(100) | 17(5.9) |
| 16 | <i>Cladrastis</i> | Papilionaceae | Trees | 1 | 3(33.3) | 4-5(20-25) | 5-12(8.3-20) |
| 17 | <i>Desmodiu m</i> | Papilionaceae | shrubs/semis hrubs/herbs | 6 | 18(33.3) | 27(22.2) | 300(2.0) |
| 18 | <i>Disporum</i> | Liliaceae | perennial herbs | 1 | 3(33.3) | 8(12.5) | 20(5.0) |
| 19 | <i>Gleditsia</i> | Caesalpiaceae | trees/shrubs | 2 | 4(50.0) | 6(33.3) | 16(12.5) |
| 20 | <i>Gymnoclad us</i> | Caesalpiaceae | Trees | 1 | 1(100.0) | 2(50) | 3-5(20-33.3) |
| 21 | <i>Halesia</i> | Styracaceae | shrubs/trees | 1 | 1(100.0) | 1(100) | 4-6(16.7-25) |
| 22 | <i>Hydrangea</i> | Hydrangeaceae | semishrubs/s hrubs | 6 | 16(37.5) | 45(13.3) | 80±(±7.5) |
| 23 | <i>Illicium</i> | Illiciaceae | shrubs/trees | 3 | 7(42.9) | 21-30(10-14.3) | 42-50(6-7.1) |
| 24 | <i>Itea</i> | Iteaceae | shrubs/small trees | 1 | 3(33.3) | 12(8.3) | 15(6.70) |
| 25 | <i>Kummerow</i> | Papilionaceae | annual herbs | 2 | 2(100.0) | 2(100) | 2(100) |

| <i>ia</i> | | | | | | | |
|-----------|-----------------------|----------------|-----------------------|---|----------|----------------|--------------------|
| 26 | <i>Lespedeza</i> | Papilionaceae | perennial herbs | 9 | 21(42.9) | 65(13.8) | 90-100+(9-10) |
| 27 | <i>Liquidambar</i> | Hamamelidaceae | Trees | 2 | 2(100.0) | 2(100) | 5(40) |
| 28 | <i>Liriodendron</i> | Magnoliaceae | Trees | 1 | 1(100.0) | 1(100) | 2(50) |
| 29 | <i>Lyonia</i> | Ericaceae | Shrubs | 1 | 4(25.0) | 6-9(11.1-16.7) | 30±(±3.3) |
| 30 | <i>Magnolia</i> | Magnoliaceae | shrubs/trees | 5 | 8(62.5) | 30±(±16.7) | 90±(±6.3) |
| 31 | <i>Mahonia</i> | Berberidaceae | Shrubs | 2 | 3(66.6) | 40-50(4-5) | 70-100±(2-2.8) |
| 32 | <i>Menispermum</i> | Menispermaceae | Climber | 1 | 1(100.0) | 1(100) | 3(33.3) |
| 33 | <i>Mitchella</i> | Rubiaceae | creepy herbs | 1 | 2(50) | 2(50) | 2(50) |
| 34 | <i>Muhlenbergia</i> | Gramineae | Herbs | 3 | 4(75.0) | 6(50) | 100(3.00) |
| 35 | <i>Nyssa</i> | Nyssaceae | Trees | 1 | 1(100.0) | 6(16.7) | 10(10.00) |
| 36 | <i>Osmanthus</i> | Oleaceae | small trees | 5 | 8(62.5) | 15(-27) | 18(-40)(12.5-27.8) |
| 37 | <i>Pachysandra</i> | Buxaceae | herbs/climbing shrubs | 1 | 2(50.0) | 3(33.3) | 4(25) |
| 38 | <i>Panax</i> | Araliaceae | Herbs | 1 | 1(100.0) | 6(16.7) | 8(12.5) |
| 39 | <i>Parthenocissus</i> | Vitaceae | woody lianas | 3 | 4(75.0) | 9(33.3) | 10-15(20-30) |
| 40 | <i>Penthorum</i> | Saxifragaceae | perennial herbs | 1 | 1(100.0) | 1(100) | 3(33.3) |
| 41 | <i>Photinia</i> | Rosaceae | shrubs/small trees | 7 | 21(33.3) | 40±(±17.5) | 60±(±11.7) |
| 42 | <i>Phryma</i> | Phrymataceae | perennial herbs | 1 | 1(100.0) | 1(100) | 1-2(50-100) |
| 43 | <i>Pieris</i> | Ericaceae | shrubs/small trees | 2 | 3(66.7) | 6(33.3) | 10(20.00) |
| 44 | <i>Pseudotsuga</i> | Pinaceae | Trees | 1 | 1(100.0) | 5(20) | 7(--18)(5.6-14.3) |

| | | | | | | | |
|----|--|------------------|------------------------|---|-----------|------------|----------------|
| 45 | <i>Pyrularia</i> | Santalaceae | shrubs/trees | 1 | 2(50.0) | 2-4(25-50) | 4-5(20-25) |
| 46 | <i>Sassafras</i> | Lauraceae | Trees | 1 | 1(100.0) | 2(50) | 3(33.3) |
| 47 | <i>Saururus</i> | Saururaceae | Herbs | 1 | 1(100.0) | 1(100) | 2(50) |
| 48 | <i>Schisandra</i> | Schisandraceae | woody lianas/shrubs | 2 | 5(40.0) | 19(10.5) | 30(6.70) |
| 49 | <i>Smilacina</i> | Liliaceae | perennial herbs | 1 | 1(100.0) | 18(5.6) | 35(2.90) |
| 50 | <i>Stewartia</i> = <i>Stuartia</i> <i>Thelycrani</i> | Theaceae | shrubs/small trees | 1 | 6(16.7) | 10(10) | 13(7.70) |
| 51 | <i>a</i> = <i>Bothroca</i> <i>ryum</i> | Cornaceae | shrubs/small trees | 1 | 1(100.0) | 1(100) | 3(33.30) |
| 52 | <i>Thermopsis</i> | Papilionaceae | perennial herbs | 1 | 1(100.0) | 7(14.3) | 30(3.3) |
| 53 | <i>Tiarella</i> | Saxifragaceae | perennial herbs | 1 | 1(100.0) | 1(100) | 5(20.00) |
| 54 | <i>Torreya</i> | Taxaceae | Trees | 1 | 3(33.3) | 4(25) | 6-7(14.3-16.7) |
| 55 | <i>Toxicodendron</i> | Anacardiaceae | trees/shrubs | 5 | 6(83.3) | 18(27.8) | 40(12.5) |
| 56 | <i>Trachelospermum</i> | Apocynaceae | woody lianas | 3 | 6(50) | 10(30) | 30(10) |
| 57 | <i>Triadenum</i> | Hypericaceae | Herbs | 1 | 1(100.0) | 2(50.0) | 10(10.0) |
| 58 | <i>Tsuga</i> <i>Tulotis</i> | Pinaceae | Trees | 1 | 2(50.0) | 4±(±25) | 10±(±10) |
| 59 | Rafin | Orchidaceae | Herbs | 1 | 1(100.0) | 3(33.3) | 5(20.0) |
| 60 | <i>Veronicastrum</i> | Scrophulariaceae | perennial herbs | 3 | 9(33.3) | 15(20) | 20(15) |
| 61 | <i>Wisteria</i> | Papilionaceae | woody lianas | 1 | 2(50) | 7(14.3) | 10(10) |
| 62 | <i>Zizania</i> | Gramineae | aquatic herbs | 1 | 1(100.0) | 1(100) | 3(33.30) |
| 63 | <i>Lithocarpus</i> | Fagaceae | Trees | 8 | 28(28.57) | 100(8.00) | 300(2.67) |

| | | | | | | | |
|----|--------------------|---------------|---------------|---|-----------|-----------|------------|
| 64 | <i>Lindera</i> | Lauraceae | Trees | 1 | 20(60.00) | 42(28.57) | 100(12.00) |
| 65 | <i>Meehania</i> | Labiatae | Herbs | 1 | 1(100) | 5(20.00) | 7(14.29) |
| 66 | <i>Agastache</i> | Labiatae | Herbs | 1 | 1(100) | 1(100) | 9(11.11) |
| 67 | <i>Podocarpium</i> | Podocarpaceae | small trees | 1 | 5(60.00) | 7(42.86) | 8(37.50) |
| 68 | <i>Nelumbo</i> | Nymphaeaceae | aquatic herbs | 1 | 1(100) | 1(100) | 2(50.00) |

Note: Wu Zheng-yi, Zhou Yi-kun, Sun Hang, et al. The areal-types of seed plants and their origin and differentiation [M]. Kunming: Yunnan Science and Technology Press, 2006, 1-566.

Table 3 Dominant formations of forest system in Mt. Huangshan, Mt. Sanqingshan and Mt. Wuyishan

| Vegetation type group | Vegetation type | Dominant formation | | |
|-----------------------|---|--|---|---|
| | | Mt. Huangshan | Mt. Sanqingshan | Mt. Wuyishan |
| Coniferous forest | I. Temperate coniferous forest | Form. <i>Pinus taiwanesis</i> | Form. <i>Pinus taiwanesis</i> | Form. <i>Pinus taiwanesis</i> Form. <i>Cryptomeria fortunei</i> |
| | II. Temperate coniferous and broad-leaved mixed forest | Form. <i>Pseudotsuga gausseni</i> , <i>Pinus taiwanesis</i> | Form. <i>Pseudotsuga gausseni</i> , <i>Tsuga chinensis</i> var. <i>tchekiangensis</i> , <i>Pinus taiwanesis</i> | Form. <i>Tsuga chinensis</i> var. <i>tchekiangensis</i> , <i>Cyclobalanopsis multinervis</i> |
| | III. Warm temperate coniferous forest | Form. <i>Pinus massoniana</i> | Form. <i>Pinus massoniana</i> Form. <i>Cunninghamia lanceolata</i> | Form. <i>Pinus massoniana</i> Form. <i>Cunninghamia lanceolata</i> |
| | IV. Warm temperate coniferous and broad-leaved mixed forest | Form. <i>Pinus massoniana</i> , <i>Castanopsis selerophylla</i> | Form. <i>Pinus massoniana</i> , <i>Castanopsis selerophylla</i> , <i>Schima superba</i> | Form. <i>Pinus massoniana</i> , <i>Schima superba</i> |
| | | | Form. <i>Cunninghamia lanceolata</i> , <i>Schima superba</i> | Form. <i>Cunninghamia lanceolata</i> , <i>Schima superba</i> |

| | | | | |
|----------------------------|---|--|---|--|
| | | | Form. <i>Sycopsis sinensis</i> , <i>Litsea coreana</i> <i>var.sinensis</i> | Form. <i>Altingia gracillipes</i> , <i>Machilus pauhoi</i> , <i>Engelhardtia roxburgiana</i> |
| | V. Ravine evergreen broad-leaved forest | | Form. <i>Elaeocarpus</i> | |
| | | Form. <i>Lithocarpus henryi</i> , <i>Litsea coreana</i> <i>var. sinensis</i> | Form. <i>decipiens</i> , <i>Cyclobalanopsis tibetana</i> , <i>Choerospondias axillaris</i> | Form. <i>Castanopsis carlesii</i> , <i>Castanopsis fargesii</i> |
| | VI. Evergreen broad-leaved forest | Form. <i>Castanopsis selerophylla</i> , <i>Cyclobalanopsis glauca</i> , <i>Phoebe sheareri</i> | Form. <i>Cyclobalanopsis glauca</i> , <i>Castanopsis selerophylla</i> , <i>Machilus thunbergii</i> , <i>Litsea coreana var. sinensis</i> | Form. <i>Cyclobalanopsis glauca</i> , <i>Castanopsis selerophylla</i> , <i>Machilus grijsii</i> |
| | | Form. <i>Castanopsis eyrei</i> , <i>Cyclobalanopsis gracilis</i> | Form. <i>Cyclobalanopsis multinervis</i> , <i>Castanopsis eyrei</i> , <i>Schima superba</i> | Form. <i>Schima superba</i> , <i>Castanopsis eyrei</i> , <i>Cyclobalanopsis multinervis</i> |
| Broad-l eaved forest | | Form. <i>Castanopsis eyrei</i> , <i>Liquidambar formosana</i> , <i>Fagus longipetiolata</i> | Form. <i>Liquidambar formosana</i> , <i>Cyclobalanopsis glauca</i> , <i>Cyclobalanopsis multinervis</i> | Form. <i>Fagus longipetiolata</i> , <i>Liquidambar formosana</i> , <i>Daphniphyllum macropodum</i> |
| | VII. Evergreen and deciduous broad-leaved mixed forest | Form. <i>Cyclobalanopsis glauca</i> , <i>Fagus longipetiolata</i> , <i>Carpinus cordata</i> | Form. <i>Liquidambar acalycina</i> , <i>Cyclobalanopsis multinervis</i> | Form. <i>Cyclobalanopsis multinervis</i> , <i>Liquidambar acalycina</i> , <i>Betula luminifera</i> |
| | | Form. <i>Stewartia gemmata</i> , <i>Cyclobalanopsis glauca</i> , <i>Hamamelis mollis</i> | Form. <i>Cyclobalanopsis gracilis</i> , <i>Carpinus viminea</i> | Form. <i>Cyclobalanopsis gracilis</i> , <i>Carpinus fargesii</i> |
| | | | Form. <i>Stewartia gemmata</i> , <i>Cyclobalanopsis multinervis</i> , <i>Disanthus cercidifolius</i> | Form. <i>Stewartia gemmata</i> , <i>Schima superba</i> , <i>Rhododendron ovatum</i> |

| | | | | | |
|--------------------------------|-----------------------------------|---|--|--|--|
| | | Form. <i>Quercus stewardii</i> , <i>Tilia japonica</i> | | | |
| Montane lower forest or shrubs | VIII. Montane lower forest | | Form. <i>Rhododendron simiarum</i> | Form. <i>Rhododendron simiarum</i> | |
| | | Form. <i>Rhododendron anhweiense</i> | Form. <i>Rhododendron anhweiense</i> , <i>Enkianthus chinensis</i> | Form. <i>Rhododendron fortunei</i> | |
| | IX. Evergreen broad-leaved shrubs | Form. <i>Buxus sinica</i> var. <i>parvifolia</i> | Form. <i>Buxus sinica</i> var. <i>parvifolia</i> | Form. <i>Buxus sinica</i> | |
| | | Form. <i>Viburnum sargentii</i> , <i>Enkianthus chinensis</i> | Form. <i>Clethra barbinervi</i> / <i>Viburnum sympodiale</i> / <i>Enkianthus chinensis</i> | Form. <i>Clethra cavaleriei</i> | |
| | X. Deciduous broad-leaved shrubs | | | Form. <i>Rhododendron farrerae</i> / <i>Enkianthus quinqueflorus</i> | |
| | | Form. <i>Hamamelis mollis</i> , <i>Corylopsis sinensis</i> | Form. <i>Corylopsis sinensis</i> | Form. <i>Corylopsis sinensis</i> | |

Table 4 Contrast of Gymnosperm in Mt. Huangshan (H), Shanjingshan (S) and Mt. Wuyishan (W), E. China

| Family | Scientific name | H | S | W | Endemism |
|-----------------|---|-----|-----|-----|----------|
| Pinaceae | <i>Pinus taiwanesis</i> | +++ | +++ | ++ | SeC |
| | <i>Pinus massoniana</i> | ++ | +++ | +++ | SeC |
| | <i>Tsuga chinensis</i> var. <i>tchekiangensis</i> | + | + | + | SeC |
| | <i>Pseudotsuga gaussenii</i> | ++ | ++ | | SeC, OG |
| Taxodiaceae | <i>Cunninghamia lanceolata</i> | | ++ | ++ | GeC, OG |
| | <i>Cryptomeria fortunei</i> | | | + | |
| Taxaceae | <i>Taxus wallichiana</i> | + | + | + | SeC, OG |
| | <i>Torreya grandis</i> | + | + | + | SeC |
| | <i>Pseudotaxus chienii</i> | + | + | | GeC, MG |
| Podocarpaceae | <i>Podocarpus nagi</i> | | | + | SeC |
| Cephalotaxaceae | <i>Cephalotaxus fortunei</i> | + | + | + | SeC, OG |
| Cupressaceae | <i>Juniperus formosana</i> | + | + | + | SeC, OG |
| | <i>Fokienia hodginsii</i> | + | + | + | SeC, OG |

Notes: “+”, “++”, “+++”: Distribution and abundance level of given species; SeC:

Species endemic to China, GeC: Genus endemic to China; MG: Monotypic genus; OG: Oligotypic genus.

Table 5 Absent or vicarious species of five typical families of evergreen forest in Mt. Huangshan (H), Mt. Sanqingshan (S) and Mt. Wuyishan (W), East China

| Family | Species | H | S | W | Distribution/Vicarious species* | |
|---|-------------------------------------|---|---|----|---------------------------------|---------|
| Fagaceae | <i>Castanopsis carlesii</i> | | + | + | S-St | |
| | <i>Castanopsis fabri</i> | | + | + | M-St | |
| | <i>Castanopsis fargesii</i> | | + | ++ | S-St | |
| | <i>Castanopsis fordii</i> | | + | + | S-St | |
| | <i>Castanopsis jucunda</i> | | + | + | M -St | |
| | <i>Castanopsis kawakamii</i> | | + | + | S-St | |
| | <i>Castanopsis tibetana</i> | | + | + | M-St | |
| | <i>Castanopsis lamontii</i> | | + | + | M-St | |
| | <i>Castanopsis hystrix</i> | | + | | S-St | |
| | <i>Castanopsis nigrescens</i> | | | | + | S-St |
| | <i>Cyclobalanopsis jenseniana</i> | | | | + | S-St |
| | <i>Cyclobalanopsis stewardiana</i> | | + | + | | M-St |
| | <i>Cyclobalanopsis sessilifolia</i> | | | + | + | M-St |
| | <i>Fagus engleriana</i> | | + | + | | M-St/VS |
| | <i>Fagus lucida</i> | | | + | + | M-St/VS |
| | <i>Lithocarpus brevicaudatus</i> | | | + | + | M-St |
| | <i>Lithocarpus hancei</i> | | | + | + | M-St |
| | <i>Quercus chenii</i> | | + | | | M-St |
| | <i>Quercus engleriana</i> | | | | + | M-St |
| | <i>Quercus oxyphylla</i> | | | | + | S-St |
| | <i>Quercus spinosa</i> | | | + | | M-St |
| | <i>Quercus stewardii</i> | | + | + | | N-St |
| | <i>Quercus serrata</i> | | + | + | | N-St/VS |
| <i>Quercus serrata</i> var. <i>brevipetiolata</i> | | | + | + | S-St/VS | |
| Lauraceae | <i>Actinodaphne lancifolia</i> | | + | | N-St | |
| | <i>Cinnamomum porrectum</i> | | + | + | S-St | |
| | <i>Cinnamomum micranthum</i> | | | + | S-St | |
| | <i>Cinnamomum subavenium</i> | | + | | M-St/VS | |

| | | | | | |
|----------------|--|----|----|----|---------|
| | <i>Cinnamomum chingii</i> | + | | | M-St/VS |
| | <i>Cinnamomum tsangii</i> | | | + | M-St/VS |
| | <i>Cryptocarya cingii</i> | | | + | S-St |
| | <i>Lindera rubronervia</i> | + | + | | M-St |
| | <i>Litsea coreana</i> var. <i>sinensis</i> | ++ | ++ | ++ | M-St |
| | <i>Machilus grijsii</i> | | + | + | S-St |
| | <i>Machilus oreophila</i> | | + | + | S-St |
| | <i>Machilus pauhoi</i> | | + | + | S-St |
| | <i>Phoebe neurantha</i> | | + | | M-St |
| | <i>Phoebe bournei</i> | | + | + | S-St |
| | <i>Phoebe chekiangensis</i> | | + | + | S-St |
| Theaceae | <i>Stewartia gemmata</i> | + | + | + | M-St |
| | <i>Adinandra millettii</i> | | + | + | S-St |
| | <i>Cleyera pachyphylla</i> | | + | + | S-St |
| | <i>Camellia chekiangoleosa</i> | | ++ | ++ | S-St |
| | <i>Eurya metcalfilana</i> | | + | + | S-St |
| | <i>Eurya brevistyla</i> | | + | + | S-St |
| | <i>Eurya macartneyi</i> | | + | | S-St |
| | <i>Eurya chinensis</i> | | | + | S-St |
| | <i>Ternstroemia gymnanthera</i> | | + | + | S-St |
| | <i>Ternstroemia nitida</i> | | + | + | S-St |
| | <i>Tutcheria spectabilis</i> | | + | + | S-St |
| Magnoliaceae | <i>Magnolia amoena</i> | + | + | | N-St |
| | <i>Magnolia cylindrica</i> | + | + | + | M-St |
| | <i>Magnolia cuspidata</i> | + | | | N-St |
| | <i>Magnolia seiboldii</i> | + | + | + | M-St |
| | <i>Manglietia fordiana</i> | + | | | M-St |
| | <i>Manglietia yuyuanensis</i> | | + | + | S-St |
| | <i>Manglietia wuyianensis</i> | | | + | S-St |
| | <i>Michelia figo</i> | | | + | S-St |
| | <i>Michelia skinneriana</i> | | + | + | S-St |
| | <i>Parakmeria lotungensis</i> | | + | + | S-St |
| Hamamelidaceae | <i>Disanthus cercidifolius</i> | | ++ | | M-St |
| | <i>Fortunearia sinensis</i> | + | + | | M-St |
| | <i>Hamamelis mollis</i> | ++ | | | M-St |
| | <i>Liquidambar acalycina</i> | | ++ | ++ | M-St |
| | <i>Sycopsis sinensis</i> | | ++ | ++ | M-St |

| | | | | |
|------------------------------------|---|---|----|---------|
| <i>Sycopsis dunnii</i> | | | + | M-St/VS |
| <i>Sycopsis tutcheri</i> | | | + | M-St/VS |
| <i>Altingia chinensis</i> | | | ++ | S-St |
| <i>Altingia gracillipes</i> | | | + | S-St |
| <i>Semiliquidambar cathayensis</i> | | | + | S-St |
| <i>Corylopsis glandulifera</i> | | | + | M-St/VS |
| <i>Corylopsis veitchiana</i> | + | | | M-St/VS |
| <i>Corylopsis hypoglauca</i> | + | | | M-St/VS |
| <i>Corylopsis multiflora</i> | | | + | M-St/VS |
| <i>Distylium myricoides</i> | + | + | + | M-St |
| <i>Distylium buxifolium</i> | | | + | S-St |

Notes: S-St: South subtropical zone; M-St: Mid-subtropical zone; N-St: North subtropical zone; VS: Vicarious species; “+”, “++” denote distribution and abundance level of given species.

Table 6 The rare, endangered and state key protected animal species in Mount Sanqingshan

| <i>Species</i> | CSKP* | IUCN* | CSRL* |
|----------------------------------|-------|-------|-------|
| <i>Paa jiulongensis</i> | | | VU |
| <i>Paa spinosa</i> | | | VU |
| <i>Paa exilispinosa</i> | | | VU |
| <i>Hoplobatrachus rugulosu</i> | II | | VU |
| <i>Pelophylax nigromaculatus</i> | | | NT |
| <i>Pelodiscus sinensis</i> | | VU | |
| <i>Elaphe taeniura</i> | | | VU |
| <i>Elaphe mandarina</i> | | | VU |
| <i>Elaphe carinata</i> | | | VU |
| <i>Ptyas korros</i> | | | VU |
| <i>Enhydriis chinensis</i> | | | NT |
| <i>Zaocys dhumnades</i> | | | VU |
| <i>Bungarus multicinctus</i> | | | VU |
| <i>Naja atra</i> | | | VU |
| <i>Deinagkistrodon acutus</i> | | | VU |
| <i>Gloydus brevicaudus</i> | | | VU |
| <i>Aix galericulata</i> | II | | NT |
| <i>Mergus squamatus</i> | I | EN | VU |
| <i>Arborophila gingica</i> | | VU | VU |
| <i>Pucrasia macrolopha</i> | II | | NT |

| | | | |
|--------------------------------------|----|----|----|
| <i>Lophura nycthemera</i> | II | | |
| <i>Tragopan caboti</i> | I | VU | VU |
| <i>Syrnaticus ellioti</i> | I | VU | NT |
| <i>Elanus caeruleus</i> | II | | |
| <i>Milvus lineatus</i> | II | | |
| <i>Spilornis cheela</i> | II | | |
| <i>Circus cyaneus</i> | II | | |
| <i>Accipiter trivirgatus</i> | II | | |
| <i>Pernis ptilorhynchus</i> | II | | |
| <i>Accipiter soloensis</i> | II | | |
| <i>Accipiter virgatus</i> | II | | |
| <i>Accipiter gentilis</i> | II | | |
| <i>Buteo buteo</i> | II | | |
| <i>Ictinaetus malayensis</i> | II | | |
| <i>Falco tinnunculus</i> | II | | |
| <i>Falco peregrinus</i> | II | | |
| <i>Glaucidium cuculoides</i> | II | | |
| <i>Glaucidium brodiei</i> | II | | |
| <i>Otus bakkamoena</i> | II | | |
| <i>Strix leptogrammica</i> | II | | |
| <i>Rhinomyias brunneata</i> | | VU | VU |
| <i>Garrulax canorus</i> | | | NT |
| <i>Leiothrix lutea</i> | | | NT |
| <i>Seicercus affinis intermedius</i> | | | NT |
| <i>Passer montanus</i> | | | NT |
| <i>Emberiza aureola</i> | | NT | NT |
| <i>Crocidura suaveolens</i> | | | VU |
| <i>Rhinolophus affinis</i> | | | NT |
| × <i>Myotis chinensis</i> | | | VU |
| <i>Macaca mulatta</i> | II | LR | VU |
| <i>Macaca thibetana</i> | II | LR | VU |
| <i>Manis penladactyla</i> | II | LR | EN |
| <i>Cuon alpinus</i> | II | VU | EN |
| <i>Vulpes vulpes</i> | | | NT |
| <i>Nyctereutes procyonoides</i> | | | VU |
| <i>Ursus thibetanus</i> | II | VU | VU |
| <i>Mustela sibirica</i> | | | NT |
| <i>Mustela kathiah</i> | | | NT |
| <i>Martes flavigula</i> | | | NT |
| <i>Arctonyx collaris</i> | | | VU |
| <i>Meles meles</i> | | | NT |
| <i>Lutra lutra</i> | II | VU | EN |
| <i>Viverra zibetha</i> | II | | EN |

| | | | |
|---|----|----|----|
| <i>Viverricula indica</i> | II | | VU |
| <i>Paguma larvata</i> | | | NT |
| <i>Herpestes urva</i> | | | NT |
| <i>Neofelis nebulosa</i> | I | VU | EN |
| <i>Panthera pardus</i> | I | EN | CR |
| <i>Felis bengalensis</i> | | | VU |
| × <i>Hydrophotes inermis</i> | II | LR | VU |
| × <i>Elaphodus cephalophus</i> | | | VU |
| <i>Muntiacus crinifrons</i> | I | VU | EN |
| <i>Muntiacus reevesi</i> | | | VU |
| <i>Capricornis sumatraensis argyrochaetes</i> | II | EN | VU |
| <i>Petaurista petaurista</i> | | | VU |
| <i>Micromys minutus</i> | | LR | |
| <i>Hystrix brachyuran</i> | | VU | VU |
| <i>Total</i> | 37 | 20 | 57 |

Notes: CSKP= China State Key Protected Plants (1999); I = State Key Protected Species Grade I; II = State Grade II Key Protected Species; IUCN =IUCN Red List of Threatened Species (2006), EN = Endangered, VU = Vulnerable, LR/nt = close to Vulnerable; CSRL : China Species Red List (2004), EN =Endangered, VU = Vulnerable.

Table 7 The endemic animal species of China in Mount Sanqingshan

| Species | Endemic to China | Mainly distributed in China |
|-----------------------------|------------------|-----------------------------|
| <i>Pachytriton labiatus</i> | √ | |
| <i>Megophrys boettgeri</i> | √ | |
| <i>Hylarana guentheri</i> | √ | |
| <i>Hylarana latouchii</i> | √ | |
| <i>Hylarana adenopleura</i> | √ | |
| <i>Odorrana schmacheri</i> | √ | |
| <i>Rana zhenhaiensis</i> | √ | |
| <i>Paa exilispinosa</i> | √ | |
| <i>Paa spinosa</i> | | √ |
| <i>Paa jiulongensis</i> | √ | |
| <i>Amolops ricketti</i> | √ | |
| <i>Polypedates chenfui</i> | √ | |

| | | |
|---------------------------------|------------|-----------|
| <i>Rhacophorus dennysii</i> | √ | |
| <i>Gekko subpalmatus</i> | √ | |
| <i>Macropisthodon rudis</i> | √ | |
| <i>Opisthotropis latouchii</i> | √ | |
| <i>Sinonatrix annularis</i> | √ | |
| <i>Sinonatrix percarinata</i> | √ | |
| <i>Zaocys dhumnades</i> | √ | |
| <i>Mergus squamatus</i> | √ | |
| <i>Arborophila gingica</i> | √ | |
| <i>Bambusicola thoracica</i> | √ | |
| <i>Tragopan caboti</i> | √ | |
| <i>Syrmaticus ellioti</i> | √ | |
| <i>Spizixos semitorques</i> | √ | |
| <i>Pycnonotus sinensis</i> | √ | |
| <i>Garrulax poecilorhynchus</i> | √ | |
| <i>Garrulax canorus</i> | √ | |
| <i>Parus venustulus</i> | √ | |
| <i>Latoucheornis siemsseni</i> | √ | |
| <i>Myotis chinensis</i> | | √ |
| <i>Macaca thibetana</i> | √ | |
| <i>Hydrophotes inermis</i> | | √ |
| * <i>Elaphodus cephalophus</i> | | √ |
| <i>Muntiacus crinifrons</i> | √ | |
| <i>Muntiacus reevesi</i> | √ | |
| <i>Dremomys pernyi</i> | | √ |
| * <i>Lepus sinensis</i> | | √ |
| 38 species | 32 species | 6 species |

APPENDIX FOUR

A Global Comparative Analysis of Gigantic Boa

Gigantic Boa, otherwise known as Python Rising To The Sky, is an isolated granite column in the NE part of the main massif of Sanqingshan. It emerges from a steep, mainly rocky slope, and overlooks a deeply incised valley below. The sides of the column are vertical, locally overhang, and the entire feature appears segmented due to the occurrence of widely spaced horizontal joints. A short distance upslope there occurs a more compact granite mass, composed of a few vertical pillars separated by a few parallel joint-aligned clefts. The geomorphological setting of the Gigantic Boa suggests that it is an erosional outlier of the rocky spur mentioned above, and a more evolved landscape feature. What makes the Gigantic Boa particularly distinctive is its dimensions. According to the topographic survey, the height of column is 128 m, whereas the diameter of the base is only 7 m. This gives the height/base width ratio in excess of 18.

Below a comparative analysis of this spectacular landscape feature is attempted, although one needs to emphasize the shortage of relevant scientific material which can be used in the global survey. In addition, a universally accepted scientific term for geomorphic features such as the Gigantic Boa does not exist.

Gigantic Boa is a landform not easy to name and classify scientifically. The term 'rock (or 'earth') pinnacle' is used in the geomorphological literature (Migon, 2004), but is usually applied to upstanding features built of soft material (former lake deposit, tuff, till) and capped by a more resistant rock fragment. Such rock pinnacles are common in badland semi-arid terrains, including several World Heritage properties, e.g. Göreme in Cappadocia (Turkey). However, they are typically only 10-20 m high, thus almost an order of magnitude less, and their origin is different from the origin of the Gigantic Boa. Pinnacles in soft materials develop through sheet wash followed by linear water erosion, whereas the Boa is the product of selective weathering guided by joints.

Another class of landforms which is relevant to discuss the Boa is a 'tor'. Tors have been defined by Linton (1955) as 'solid rock outcrops as big as a house rising abruptly from the smooth and gentle slope of a rounded summit or broadly convex ridge'. The type area for tors is the granite upland of Dartmoor in south-west England. The terminological problem here is that the Boa does not rise from a gentle regolith-covered slope, but from quite a steep rock slope. However, it fulfils other prerequisites for a tor such as being built of solid rock or emerging abruptly from the slope. In addition, tors are generally

considered as geomorphic features due to selective weathering and denudation, which leave the more massive rock intact as a residual (tor). The origin of the Gigantic Boa is thus consistent with the accepted origin of tors. If the Boa is considered as a specific example of a tor, then its dimensions are truly unique. Tors in the form of tall, narrow pinnacles are known from various granite terrains, including Dartmoor, but such pinnacles hardly exceed 10 m high (Linton 1955, Migon 2006). Indeed, the highest granite tors reported in the literature approach 25-30 m (e.g. Vixen Tor in Dartmoor – 27 m, Pielgrzymy in Karkonosze (Poland) – 25 m) and their height/base width ratio is invariably much less than 1.

Tall, isolated rock pillars are also known from coastal settings where they are called 'stacks'. They are product of selective wave erosion, focused at the rock slope base, and weathering, and may form in different lithologies. Columnar stacks are known from sandstone, conglomerate, limestone, chalk, and granite. The height of stacks often exceeds the height of tors, and stacks which are a few tens of meters high are not uncommon, especially along high energy coasts (Great Britain, France, Oregon/USA). Perhaps the tallest landform of this kind is the Old Man of Hoy in the Orkneys (Great Britain), which is 137 m high. However, it is built of flat-lying sandstone, not of granite, but more importantly, sea stacks have a very different origin from the Gigantic Boa. In the case of Sanqingshan's Gigantic Boa, no marine agencies have ever been involved. Whereas tall stacks along coasts may be common, similarly-looking geomorphic features of comparable height in inland settings are extremely rare.

An all-slopes type of granite landscape (Migon 2006) may include columnar and conical residual landforms, particularly if some glacial modification has taken place. Pinnacles and spires, partly isolated from the general slope, are known from glaciated high-mountain terrains, such as the Alps, Pyrenees, or the Andes (Twidale 1982). They are described as 'aiguilles' and usually occur collectively, accounting for the highly serrated nature of slopes. Individual aiguilles may exceed the Boa in height, but not in the height/base width ratio. Actually, a typical 'aiguille' is a sharp-pointed cone with a wide base, tapering upwards. There is also a significant genetic difference between 'aiguilles' and the Boa. Sanqingshan lacks any evidence of past glaciation, hence glacial undercutting of slope, instrumental in the origin of serrated Alpine slopes, has not occurred here. Rather few examples of unglaciated, extensive granite rock slope landscapes appear to exist, such as The Needles in South Dakota. However, available information and photographs suggest that neither of them hosts a singular feature comparable with the Gigantic Boa of Sanqingshan.

Outside granite, free-standing pillars do occur in sandstone terrains, especially if these

have been considerably dissected. Then, combination of fluvial dissection, slope retreat and differential weathering, may lead to the isolation of more massive compartments which rise from the slope, very much like the Gigantic Boa does. Young and Young (1992) have provided a comprehensive description of landform diversity in sandstone terrains and included solitary sandstone columns in their discussion. The tallest sandstone pillars exceed 50 m high (e.g. Totem Pole in Monument Valley – height in excess of 100 m is reported, but is likely to include the wide plinth, USA; Milenci in Adrspach Rock City, Czech Republic – 86 m), hence less than the height of the Gigantic Boa. Spider Rock in Canyon de Chelly, Arizona (USA), is 240 m high but its base is a few tens of meters long, hence its landscape appearance is different. A detailed comparative analysis is difficult, because relevant data are not always available. However, whereas very tall and narrow columns (although not as tall as the Boa) in sandstones occur in a number of places, comparable features in more massive granite are very rare.

Finally, slender free-standing columns are prone to collapse, either under its own weight or after a seismic shock. A few well-known pillars disintegrated in historical times, such as the Mukurob (Finger of God), which was 34 m tall and collapsed into rubble on 4 December 1988. A number of coastal stacks collapsed as well, including one of the Twelve Apostles, 45 m high, off the coast of Australia on 3 July 2005. Tall rock columns are therefore geologically short-lived features and need particular attention.

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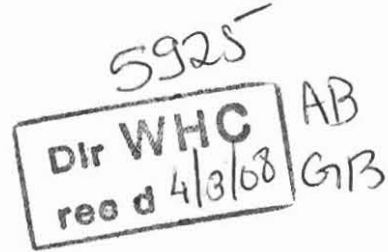
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28 February 2008

**Subject: Nomination of "Mount Sanqingshan National Park" (China)
for inscription on the World Heritage List**

Dear Mr. David Sheppard,

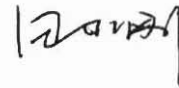
Following my letter on 25 January 2008 concerning about the nomination of "Mount Sanqingshan National Park" on the World Heritage List, we have consulted with domestic and international experts on world heritage widely again.

After serious and careful consideration to the suggestions made by IUCN Panel, for the evident differences on natural and cultural features between the two sites, and in consideration of the Operational Guidelines for serial nominations and WH site extensions, furthermore, in view of the two sites locating in two different provinces, we found it very difficult and almost not practicable to combine "Mount Sanqingshan National Park" and "Mount Huangshan" as a serial nomination or as an extension nomination of "Mount Huangshan". Therefore, for the better conservation of "Mount Sanqingshan National Park", my government would like to insist that "Mount Sanqingshan National Park" be nominated for inscription as an **individual** natural property on the World Heritage List in the 32nd WHC session in 2008.

Please find enclosed the comments made by experts for your reference and evaluation. Please don't hesitate to contact me, if you need any further information.

I would like to express my sincere thanks once again to you and IUCN for your reorganization on the outstanding universal value of "Mount Sanqingshan National Park" and for your continued support and great help to the evaluation and nomination of "Mount Sanqingshan National Park", as well as the conservation of World Heritage sites in China.

Please accept, Sir, the assurances of my highest consideration.



TIAN Xiaogang
Secretary-General

cc: Chinese Permanent Delegation to UNESCO
Ministry of Construction, P. R. China
World Heritage Center of UNESCO

Comments on the evaluation of "Mount Sanqingshan National Park"

28 February, 2008

For the evidently differences on natural and cultural features between the two sites, and in consideration of the Operational Guidelines for serial nominations and WH site extensions, it is considered that an approach to combine Mount Sanqingshan and Mount Huangshan as a serial nomination under the same criteria is almost not practicable. The reasons are following:

1. In the preceding history of world heritage, every separate component under the serial nomination should meet the same criterion, rather than different components satisfy different criterion, for example, South China Karst and the Central Eastern Rainforest Reserves of Australia.
2. As for the extension of world heritage sites, for example, the Canadian Rocky Mountain Parks (natural site), the Classical Gardens of Suzhou (cultural site), and the Uluru-Kata Tjuta National Park (mixed site), the nomination for extension has always been based on the criteria defining the original site. In other words, all of the extended parts should be consistent with the criteria of the original site.
3. There were indeed exceptions that some properties, both cultural and natural sites, whose criteria changed after extension, such as the Imperial Palace of the Ming and Qing Dynasties in Beijing and Shenyang (China) and Ha Long Bay (Vietnam) to which criterion (i) was added in 2000 in addition to the site's existing 1994 listing under criterion (iii)). Clearly, in most cases for an extended property more criterions were used after extension rather than a reduction of its existing criterion.
4. In the cases of Mount Sanqingshan and Mount Huangshan, the significant point is that they belong to different world heritage categories. Mount Huangshan is a mixed

site, being inscribed under criteria (ii), (vii) and (x), while Mount Sanqingshan has been nominated as a natural site, claiming criteria (vii), (viii) and (ix). Since we can neither change the mixed site status of Mount Huangshan, nor subjectively add cultural criteria to the Mount Sanqingshan nomination, it is not possible to combine the two sites.

5. In term of their natural properties, Mount Huangshan and San Mount qingshan bear different values. Mount Huangshan was inscribed as a natural site for its outstanding natural beauty and biological diversity. The Outstanding Universal Value of the geomorphology of Mount Huangshan was neither claimed nor recognized, while the globally unique landforms and landscape evolution of Mount Sanqingshan form a principal component of its claim of Outstanding Universal Value. Mount Sanqingshan also bears Outstanding Universal Value with respect to its earth history record and significant geological features (Criteria viii), i.e., beyond the granite geomorphology. Furthermore, although Mount Sanqingshan has outstanding biodiversity, comparable, if not better than that of Mount Huangshan, it has been nominated under Criteria ix (biological processes) because of its enormously important and precious resource of relict and disjunctive species. Mount Sanqingshan has healthy populations and is a dispersal centre of these species, which Mount Huangshan, or indeed Mount Wuyi, are not. As the majority of the granite landforms, plant communities and natural processes on Mount Sanqingshan are pristine and remote from human interference, which they are not on Mount Huangshan, the mountain is a vitally important reservoir and natural laboratory, where ongoing geological and biological processes may be observed and encouraged to flourish.

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25 January 2008

**Subject: IUCN Evaluation of "Mount Sanqingshan National Park" (China) –
Nomination for inclusion on the World Heritage List**

Dear Mr. David Sheppard,

It is my pleasure to receive your letter on 19 December 2007 to H.E. Mrs. Shi Shuyun, Ambassador and Permanent Delegate of China to UNESCO, and the email messages between Mr. Bastian Bomhard and Mr. Wu Zihui on Jan. 13 and 17, concerning the above mentioned subject. The Chinese National Commission for UNESCO appreciates the positive response of IUCN Panel to our world heritage nomination dossier.

After seriously consulting with the Ministry of Construction and the local authority concerned about the proposal from IUCN, we sincerely wish that Mount Sanqingshan can be inscribed as a separate World Heritage property at the 32nd session of World Heritage Committee, which will be held from 2 to 10 July 2008 in Quebec City, Canada, since IUCN considers the value of Mount Sanqingshan are similar to the existing World Heritage property Mount Huangshan.

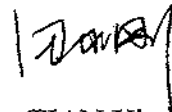
However, if IUCN insists on the additional point as you noted in the letter, we could like to see IUCN recommending Mount Sanqingshan to be inscribed on the World Heritage List as the extension of Mount Huangshan at the 32nd session of World Heritage Committee. The name could be modified to "Mount Huangshan – Mount

Sanqingshan”.

It has been many years of hard work for the Chinese governments and people, especially the local authorities and residents to protect Mount Sanqingshan, and now it is the time to nominate it as the World Heritage property. It would be extremely disappointing not to inscribe it on the World Heritage list in 2008 for its outstanding universal value and for the criteria it meets.

Thank you for your continued support to the protection of the world heritage sites in China. Please don't hesitate to contact me, if you need any further information.

Please accept, Sir, the assurances of my highest consideration.



TIAN Xiaogang
Secretary-General

cc: Chinese Permanent Delegation to UNESCO
Ministry of Construction, P. R. China