



Social Capital for Sustaining MAB Actions

**Cat Ba Archipelago
Biosphere Reserve, Vietnam**

An example of Good Practice for Biosphere Reserves

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Since 2002, Assist Social Capital (a community interest company limited by guarantee) has been investigating the practical application of social capital, defined by the OECD as "*networks together with shared norms, values and understanding that facilitate co-operation within or among groups*".

“Each one of the biosphere reserves in the World Network must have examples where the relationship between conservation, socio-economic wellbeing research and monitoring is clearly demonstrated.

Searching, collecting, documenting and disseminating such case studies should be an important part of the work to be undertaken as part of the learning laboratories”

Ishwaran et al. (2008)

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Acronyms

APBRN	Asia Pacific Biosphere Reserve Network
ASC	Assist Social Capital CIC
BR	Biosphere Reserves
CAP	Community Action Plan
CBBR	Cat Ba Archipelago Biosphere Reserve
CLD	Casual Loop Diagram
ICC	International Co-ordinating Council for the MAB programme
ISSS	International Society for Systems Sciences
IUCN	International Union for Conservation and Nature
KAS	Konrad Adenauer Stiftung (engl. Konrad Adenauer Foundation)
LLab	Learning Laboratory
MAB	Man and the Biosphere programme
MAB VN	MAB Vietnam
MAP	Madrid Action Plan for Biosphere Reserves
NGO	Non-governmental organisation
SEBR	Social Enterprise and Biosphere Reserve Framework
SeaBRnet	Southeast Asian Biosphere Reserve network
SPP	Sustainable Public Procurement
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCED	World Commission on Environment and Development
WHC	World Heritage Centre
WNBR	World Network of Biosphere Reserves
WNICBR	World Network of Island and Coastal Biosphere Reserves
ZGAP	Zoologische Gesellschaft für Arten und Populationsschutz (engl.: Zoological Society for Conservation of Species and Populations)

Executive Summary

Translating the biosphere reserve (BR) concept from theory into practice and to implement it successfully has proven challenging. Biosphere reserves as Learning Laboratories (LLabs) offer an opportunity for each one to inform and adapt its management to develop improved and more balanced strategies and policies (Ishwaran *et al.*, 2008).

Cat Ba was one of the first BRs to introduce a systems thinking approach to their management structure. They developed and integrated this into an adaptive management framework to provide a continuous and flexible approach to inform managerial and policy decision-making the *Evolutionary Learning Laboratory for Sustainable Development*.

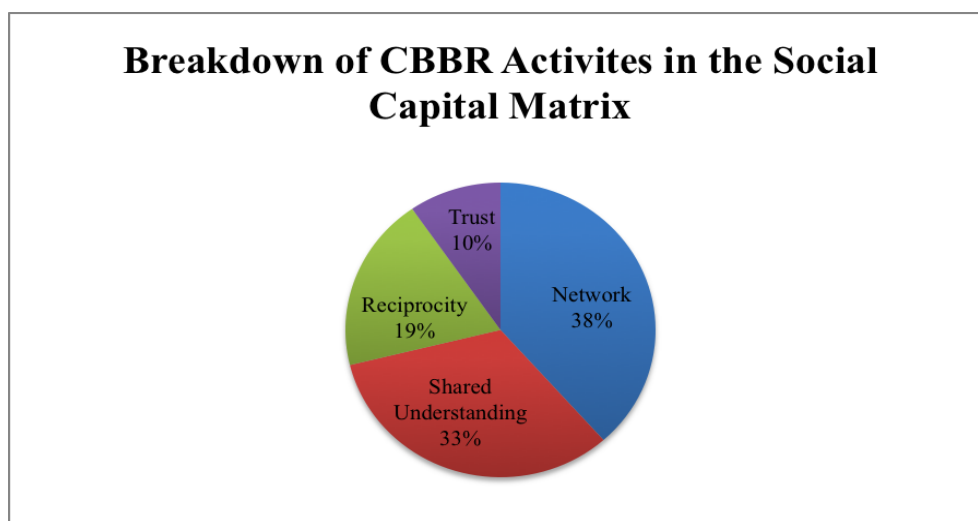
The close correlation between systems thinking and social capital led to this case study on social capital within BRs. The study shows that through the lens of social capital, the approach adopted by this highly innovative and active BR has fostered a platform of participation, trust and mutual understanding, which has helped deliver on the three main functions of a biosphere reserve.

Cat Ba BR accomplishments:

- Pioneered the adoption of LLabs and system thinking approach, extending this learning to the wider Vietnam BR network
- Successfully invested in developing an extensive ecosystem of relationships amongst diverse local, national and international stakeholders
- Stakeholders have extensive and deep shared understanding of the aims and objectives of the BR
- The impacts of climate change on the natural and social systems of Cat Ba island are clearly understood by the inhabitants of the island which has led to significant success in conserving the natural biodiversity
- Many different partnerships have emerged from the extended platform. These reciprocal relationships enabled Cat Ba BR to learn from others and adapt new methodologies with significant impact; the most notable being the Evolutionary Learning Laboratory (ELLab) framework which integrates systems thinking and adaptive management strategies. The success has inspired the government of Haiphong to consider implementing the approach at local governmental level
- Introduced a Cat Ba BR Logo and charter for local businesses

Collective objectives of the people of the CBBR	
1	Ecotourism
2	Tourism
3	Protection of the forest
4	Waste disposal
5	Short-term income
6	Protection & Conservation of local animal species
7	Subsistence Fisheries
8	Conservation of local culture and ceremonies
9	Shoreline and Mangrove Protection
10	Participation in decision-making
10	Inter-village collaboration
12	Commercial Fishing

In the table on the left, there is a list of the objectives ranked by local stakeholders in the order of importance, followed by a chart (below) that shows how active CBBR has been in generating social capital - extensive networks of shared understanding.



The already high levels of social capital through participation, the involvement of the public sector, Vietnam's first BR investment fund and a BR charter, could be further enhanced by the adoption of activities designed to cultivate community owned business. Introducing a stronger focus on values based businesses; specifically community owned social enterprises that reinvest surpluses, would directly deliver on the objectives identified by the people involved in the BR.

The results outlined in this Social Capital Case Study demonstrate that CBBR already has many of the characteristics required to support the emergence of a strong social enterprise sector with which to enrich the values identified in the CBBR Charter. These new businesses would provide jobs, income to support family life and further empower local people.

We believe that investing in a programme of training in social entrepreneurship and social enterprise would give CBBR an excellent opportunity to take on a new leadership role within the Vietnam BR network and the wider Asia Pacific network.

1. Case Study on Social Capital for Sustaining MAB Actions

This case study on Cat Ba Biosphere Reserve (CBBR) has been produced in response to a call by UNESCO Jakarta for a series of case studies relating to best practices and management experiences acquired by biosphere reserves in Asia and the Pacific region. In October 2013, Colin Campbell, Executive Director of Assist Social Capital CIC (ASC) attended the 7th SeaBRnet meeting in Puerto Princesa to launch the 'Social Enterprise and Biosphere Reserves Development (SEBR) Framework', a working document produced with support from the Scottish Government, to enhance opportunities for sustainable economic development using social capital as a key resource. The event led to an ongoing dialogue with CBBR to explore opportunities for collaboration based on shared understanding of the importance of relationships amongst the diverse stakeholders of a BR for sustainable development.

Cat Ba is an excellent focus for this case study since much of its success can be attributed to its unique approach to participation that stems from the use of systems thinking to deliver the Learning Laboratory approach. As a result, Cat Ba BR is a pioneering site and example of good practice in many respects. In 2007, it became the first BR in Vietnam's network to incorporate a systems thinking approach as LLab. Since then, CBBR has been working to build a highly participatory system to engage stakeholders in its efforts to promote the values of biosphere reserves, using the SLIQ model (Systems thinking, Land/Seascape planning, Intersectoral coordination, Quality Economy); it has also been part of the local community profession groups (i.e. farming, fisheries, forestry, tourism), young people, school students and teachers as well as all seven village Community Learning Centres on Cat Ba island. Additionally, it was identified as a national example of good practice in combining conservation and development for sustainable development (SD) at the UN Conference on SD, Rio+20, June 2012. Therefore, ASC is delighted to count with their support and collaboration on this work.

1.1. Objectives and expected Outcomes

This proposal is based on three key objectives to help towards the overall goal of strengthening and promoting BRs as learning centres for environmental and human adaptability to climate change.

Objective 1: Using the SEBR framework document and focusing on the social capital and participation element of it we will gather information of the extent of public awareness on climate change through Community Learning Centres (CLCs) experiences in Cat Ba BR, in the Asia-Pacific region. This will provide background information on how Cat Ba has invested in social capital and how this has helped to pave the way towards new opportunities, better communication, self-organisation and in summary to more resilient communities.

Objective 2: Documented analysis of best practices on promoting sustainable livelihoods in Cat BA BR. This will be achieved through this Social Capital Case study using social capital as an underlying operating system and the 4 pillars of SEBR Framework as the methodology (public participation, sustainable public procurement, social investment and social/community enterprise). The study will reflect the cultural sensitivity and level of shared understanding of the aims of the MAB programme.

Objective 3: Recommendations to strengthen cooperation of the Asia-Pacific Biosphere Reserve Network and for developing a knowledge-sharing platform on best practices (with support from the Scottish Government).

1.2. Social Capital & CBBR

To achieve these objectives ASC focused on three main actions. Firstly, we carried out a field trip to visit CBBR, developed a questionnaire to further investigate and assess social capital and finally, we analysed the outcomes of these activities, together with previous reports against a social capital matrix and the Social Enterprise & Biosphere Reserve Development Framework, which has social capital as the ‘connecting thread’, running through it.

We had hoped that in addition we would be able to pilot the Social Enterprise & BR Platform that ASC has developed (also with support from the Scottish Government) to collate evidence of sustainable economic activities taking place within BRs. However, due to time constraints, this work will now be carried out at a later date.

1.2.1 Field Trip

The study visit of Executive Director Colin Campbell, was organised and hosted by Mr Lê Thanh Tuyên, providing first hand understanding of the geographic and social context of CBBR.

Study Tour 22-24 December 2014

The first meeting of the study visit gave Colin the opportunity to meet with Mr Nguyen Tu Trong, Vice Director, Haiphong Provincial Department of Agriculture and Rural Development.

Next we travelled to Cat Ba island. There we met with Mr Nguyen Hoang Minh, Vice Mayor, Cat Hai District Government, Mr Hoang Van Than, Chairman of Farmer Union of Cat Hai District, Mr Nguyen Hoai Nam, Head of Cat Hai District Division of Agriculture and Rural Development and Ms Vu Thi Huong Sen, Extension Officer, Cat Hai District Division of Agriculture and Rural Development.

After this we were welcome by Mr Nguyen Hoai Giao, Chairman of People's Committee of Phu Long Commune, where we visited a local cave, that could be developed as an ecotourism attraction and nearby orange grove, which had significant capacity for development of local produce.

This was followed by a meeting with Mr Tran Quang Luan, Chairman of People's Committee of Gia Luan Commune. Here we were invited to take a trip on a motorboat that takes ecotourists out to areas that are excellent for walking and observing the local flora and fauna. Afterwards Mr Vu Hong Hung, Chairman of Phu Long Mangrove Community-based Ecotourism Club invited us for dinner at the Ecolife Café.

On the last day Colin's tour was hosted by Mr Nguyen Van Phien, Vice Director of Cat Ba National Park, which included a tour of the renowned Hai Long Bay, World Heritage Site.

The discussions held during the visit centered around the need to encourage development and the creation of new jobs and local community initiatives in harmony with the ethos and the objectives of the BR. Opportunities for new businesses included taking advantage of the rich flora, fauna and cultural heritage on the island. Issues include the need for the local infrastructure to be upgraded, managing the waste that is produced by the growing number of visitors, the importance of regenerating the mangroves for protection of the coastal environment, without damaging the successful shrimp farms.

While the visit clearly demonstrated the understanding of the aims and objectives of CBBR at every level, and the success of the ELLab approach, the topic of entrepreneurship and how to go about setting up new businesses in the communes stood out as a subject which required further investigation.

1.2.2 Social Capital & Social Enterprise

The methodology used to produce this case study was to identify the activities carried out by CBBR in the last few years and to assess these against social capital and social enterprise matrices.

- The OECD (2001) defines social capital as “*networks, together with shared norms, values and understanding which facilitate cooperation within and among groups*” Social capital is key to maximising a community’s potential as it enables them to become agents for sustainable development. CBBR’s activities and projects were assessed against social capital and the three BR functions addressed through this activity (See 3.1). The social capital matrix enabled us to assess the success of CBBR in creating social capital and how this facilitated the delivery of the three key functions of a BR
- The Social Enterprise and BR Development Framework has been created to provide a *route map* towards the emergence of social enterprise. There are four factors in the SEBR framework underpinned by social capital to encourage sustainable economic development in harmony with the aims and objectives of biosphere reserves. All four framework factors are inter-related and inter-connected. An explanation of each of the four SEBR Framework factors is given in section 4 below.

1.2.3 Social Capital Questionnaire

ASC prepared a questionnaire to provide us with additional qualitative and quantitative data to back up the field trip and the desk based research. The CBBR team translated the questionnaire and information was collected from three groups representing major stakeholders in CBBR (CBBR team, local community and business group).

The questionnaire included a combination of open questions, checklists rating and ranking questions about the BR, the CLCs, the local community and the local economy. Within each group there were female and male representatives.

2. The Man and the Biosphere (MAB) Programme

2.1.1. Background

Increasingly humanity is impacting on the natural environment and biodiversity. There is a growing need for reconciliation between the natural environment with economic as well as social development. Within this context and with a particular focus on preservation and conservation, UNESCO launched the Man and the Biosphere (MAB) programme in 1971 (Coetzer *et al.*, 2014; Ishwaran *et al.*, 2008). Out of this framework emerged the biosphere reserve (BR) concept for context-specific conservation in 1974 (Ishwaran *et al.*, 2008), and two years later the World Network of Biosphere Reserves (WNBR) was born (Ishwaran, 2009).

MAB can be considered as a concept as well as a tool for international cooperation in order to address issues related to nature conservation and relevant interdisciplinary research and education (Ishwaran *et al.*, 2008). It also provides the basis for a more sustainable long-term approach to improve the relationship between the environment and the people living within it on a regional level (Coetzer *et al.*, 2014).

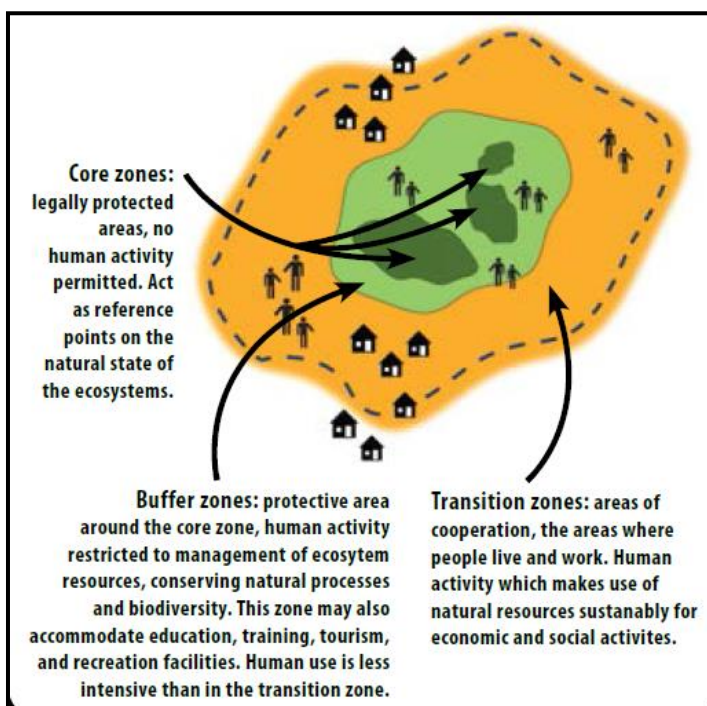
The **three main functions a biosphere reserve are** (UNESCO, 1996; Ishwaran *et al.*, 2008; Coetzer *et al.*, 2014):

- (i) **Conservation role** - preservation of ecosystems, landscape, species and genetic resources
- (ii) **Logistic support role** - support projects, research and monitoring, environmental education
- (iii) **Development role** - foster sustainable economic and human development

Correspondingly, to be able to translate the three roles into practice, UNESCO-MAB has structured the zoning of the biosphere reserve into **three**: the core, buffer and transition zone (UNESCO, 1996; Ishwaran, 2009) (see figure 1).

However, to translate the biosphere reserve concept from theory into practice and to implement it successfully has proven to be challenging (Coetzer *et al.*, 2014).

Figure 1: Biosphere Reserves – Three Zones



(Source: ASC, 2013)

The MAP recognises this and the idea for biosphere reserves to become ‘training grounds’ to develop sustainable development principles translated into local contexts (Ishwaran, 2009: 3). This more site-specific application of an international principle is reflected in the recent emphasis on biosphere reserves as **Learning Laboratories (LLabs)** for Sustainable Development in order to address remaining gaps of implementation (Ishwaran *et al.*, 2008). Additionally, greater local participation and ‘social learning’ were reinforced through the MAP (UNESCO-MAB, 2008; Reed and Massie 2013).

This ‘learning approach’ for biosphere reserves can be considered as the next phase of the evolution of the concept after the initial phase and the Seville strategy (Ishwaran *et al.*, 2008: 12). Its more dynamic nature facilitates knowledge generating activities such as data collection and research as well as on-ground experience gathering and ‘experimenting’ to better inform management actions and policy-making within biosphere reserves. As a result, BRs provide a training ground for creating and testing relevant practices and assumptions within the conservation – socio-economic relationship (*Ibid.*).

Despite the continuous challenge in the current 631 biosphere reserves in 199 countries worldwide (UNESCO, 2014a) of implementing the BR framework in the diverse local settings, the adapted approach for biosphere reserves as LLabs provides an opportunity to learn from their own experiences as well as each other’s practices which, in turn, can enable and inform the biosphere reserve management and other stakeholders to develop improved and more balanced strategies and policies (Ishwaran *et al.*, 2008).

2.2. MAB Vietnam and the SLIQ Approach

2.2.1. Can Gio – Vietnam’s 1st Biosphere Reserve

The first biosphere reserve established in Vietnam was Can Gio in 2000. The relevance of Can Gio lies in both its success as a major site of mangrove rehabilitation and the fact that it was the first area within Vietnam to become a biosphere reserve and therefore marks the beginning of the MAB VN network. The Can Gio BR covers a large area of mangrove forests which were almost completely destroyed during the Second Indochina War (1965-1969) when US air forces sprayed chemical agents over the forests (ISME, 2014).

After the war, damage to the landscape was aggravated due to tree felling by the local people for fuel and to build their homes. In addition, the success of shrimp exports encouraged the clearing of mangroves for shrimp farming. The resulting lack of a protective green belt caused the unprotected land along rivers and canals to become severely eroded.

A major reforestation programme was introduced in 1978 (*Ibid.*). And in 1991, Can Gio was designated a protected coastal region. In 2000 the area became Vietnam’s first UNESCO-MAB designated region. Overall, “*the area is one of the most successful examples of rehabilitation of damaged mangroves in the world*” (*Ibid.*: 15).

The success of Can Gio BR set the context for the BRs in Vietnam providing a positive platform for development of new sites to continue the successful rehabilitation and conservation through a growing number of BRs.

2.2.2. MAB VN

Since then seven more reserves have been established (Nguyen, 2009). Collectively they form MAB Vietnam (VN). Overall, the Vietnamese MAB network covers a total area of 3,825,807 hectares and a population of about 1,088,156 people (Nguyen, 2009).

The MAB national committee provides the basic guidelines for the biosphere reserves in Vietnam (Nguyen, 2009). It emphasises the importance of cross-institutional activities as well as the involvement of all levels of governance as the “*effective coordination of all biosphere reserve functions in all three zones is only feasible through active involvement of governance, management and professionals*” (Ishwaran *et al.*, 2008: 118).

To achieve this aim the MAB national committee works together with the Chairs and Vice-chairs of the relevant local governments and People’s Committees of the provinces the biosphere reserves are located in, as they are responsible for the effective implementation and testing (Nguyen, 2009; Ishwaran *et al.*, 2008). The governmental support for biosphere reserves in Vietnam is crucial to avoiding potential mismatches between policy and practice (Ishwaran *et al.*, 2008).

Box 1: The eight Vietnamese Biosphere Reserves

2000	Can Gio Mangrove BR
2001	Dong Nai BR(former Cat Tien BR)
2004	Cat Ba Archipelago BR
2004	Red River Delta BR
2006	Kien Giang BR
2007	Western Nghe An BR
2009	Cu Lao Cham - Hoi An BR
2009	Mui Ca Mau BR

(UNESCO, 2014c; Nguyen, 2009)

2.2.3. The SLIQ Approach

Within the MAB VN network for biosphere reserve, the SLIQ approach has been introduced to manage biosphere reserves as well as for designating new sites (Nguyen *et al.*, 2013). SLIQ is an acronym for:

- ‘S’ *Systems Thinking* – an approach applied academically as well as practically to achieve harmonisation of conservation with development
- ‘L’ *Land/Seascape and Spatial Planning* – zonation of the different landscapes of the BR into the ‘three-zone-scheme’ of UNESCO-MAB; involves ecology-based planning under consideration of the various political-ecological-cultural tenures
- ‘I’ *Intersectoral Coordination with Involvement of Stakeholders* – aim to achieve mutual understanding and partnerships between state, market and civil society through multi-stakeholder involvement and combining bottom-up and top-down approaches
- ‘Q’ *Quality Economy* – aim at building a conservation-based/green economy and sustainable development by introducing BR labelling for goods and services

(see Nguyen *et al.*, 2013)

The aim is to achieve a balance between conservation and socio-economic development activities and factors within the biosphere reserves are adapted to their locally specific context (Ishwaran *et al.*, 2008).

The Cat Ba BR itself piloted the MAB VN strategy including the SLIQ approach, together with the implementation of the LLab approach of the UNESCO-MAB (*Ibid.*). The knowledge and experience gained through this pilot was then implemented across all biosphere reserves in the country (*Ibid.*). The provincial authority of Hai Phong is responsible for the Cat Ba Archipelago Biosphere Reserve (CBBR). The local government’s aim is ultimately to apply the conservation and socio-economic approaches developed within CBBR across the whole Hai Phong Province.

3. Cat Ba Archipelago Biosphere Reserve (CBBR) – A Case Study for Good Practice in Systems Thinking and Social Capital

3.1. Introduction to CBBR

3.1.1. Background

As mentioned previously, CBBR has piloted the SLIQ approach of MAB VN and it is also the 1st Learning Laboratory for Sustainable Development using systems thinking as a management approach Bosch and Tri, 2009; Nguyen *et al.*, 2009, 2011). At Rio+20 it has been named as an example for good practice for piloting this unique mechanism as well as creating this model for BRs (Ministry of Planning and Investment, 2012: 30-33).

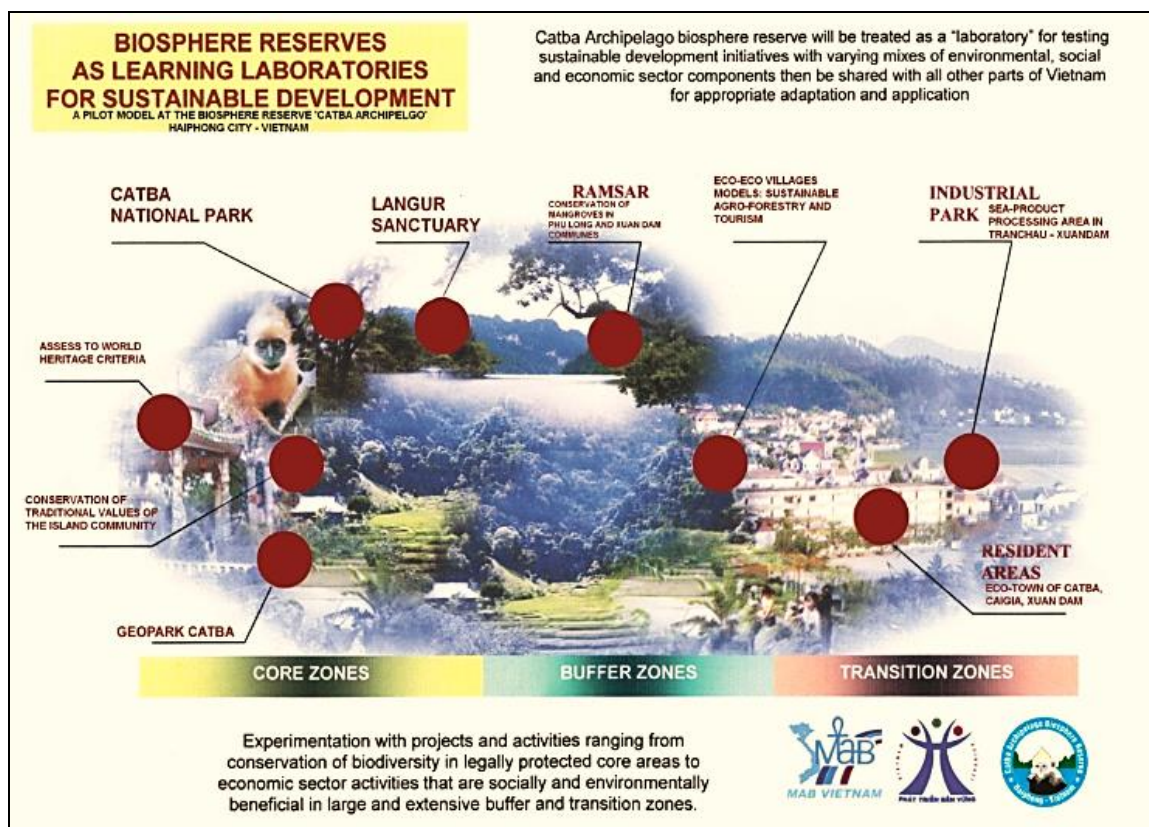
CBBR is located in the North-East of Vietnam on the Cat Ba Island in the Gulf of Tonkin. It received the designation as a biosphere reserve in 2004. The biosphere reserve covers 90 percent of the island which translates into a total area of 26,241 hectares of which 9,200 hectares cover marine territory and 16,941 hectares being terrestrial (CBBR, 2014; UNESCO-MAB, 2007). This area, as part of the ‘Landscape Planning’ (L), has been divided into the core (8,500ha), buffer (7,741ha) and transition zones (10,000ha) (CBBR, 2014; UNESCO-MAB, 2007) (see map, appendix 1).

CBBR has the highest biodiversity in the country and is a priority for global conservation. There are seven adjacent ecosystems which include mangroves, rainforest, caves and grottos, marine lakes, tidal flats, soft bottoms and coral reefs. Those diverse ecosystems form the habitat of over 3,900 identified flora and fauna species with a significant number (about 130) being classified ‘rare’ and/or ‘endangered’/ ‘critically endangered’ such as the endemic Cat Ba Langur (CBBR, 2014; Le and Nguyen, 2013; UNESCO-MAB, 2007).

Besides the diverse flora and fauna, there are about 17,000 inhabitants living on Cat Ba island overall. However, only 7,000 people are actually living within the BR in six communes which are located in the buffer and/or transition zone (Le and Nguyen, 2013). The rich cultural diversity and history of the island is furthermore reflected through the 77 detected archaeological and historical sites dating back as far as 6,000 years (Ministry of Planning and Investment, 2012; UNESCO-MAB, 2007).

Overall, CBBR’s international significance for sustainable development and nature conservation lies within its biodiversity as well as landscape, cultural and socio-economic values (CBBR, 2014; Le and Nguyen, 2013) (see figure 2).

Figure 2: ‘Rich Picture’ of the Cat Ba Biosphere Reserve



(Source: Nguyen *et al.*, 2013)

Challenges and Opportunities

Subsequently, CBBR is also considered as one of the county's most attractive places to visit. This has led to a stark increase in tourism to the island and whilst positive for the local economy it also forms part of the challenges the CBBR is facing. In addition to a growing population of tourists, the island is also experiencing increasing population pressures. This increased number of people living and visiting Cat Ba island provides growing challenges in relation to waste and pollution management as well as the overuse of ground waters. At the same time, there is a lack of fresh water and electricity next to insufficient infrastructure resources (CBBR, 2014; Nguyen and Bosch, 2013).

Another challenge presents itself in the relative poor economic conditions of the local people as the island communities (including a high number of floating houses and farms) suffer from poor educational and health care standards which, in turn, lead to a lack of skilled labour. Those social challenges led to illegal hunting and exploitation of the island's resources (CBBR, 2014; Nguyen and Bosch, 2013; Nguyen *et al.*, 2011).

Though, being faced with those challenges of balancing economic growth in a sustainable way with environmental conservation, sustainable land use as well as social and community development, CBBR is also using this as an opportunity through using the BR as a platform for sustainable development (LLab) by pioneering a new management approach through the application of systems thinking, a participatory and collaborative multi-stakeholder approach (Nguyen *et al.*, 2011).

3.2. Systems Thinking Model for Cat Ba Biosphere Reserve

Systems thinking¹ provides a ‘new way of thinking’ with the ability to capture more holistically the complexity and changing dynamics of contemporary issues such as sustainability (Nguyen and Bosch, 2013; Bosch *et al.*, 2007a, 2007b). To capture this complexity researchers increasingly apply multi-stakeholder participatory research methods (Bosch *et al.*, 2007b)².

Until recently, the systems thinking approach had not been applied within the BR context. Though, its characteristics make systems thinking an ideal method for their management. In collaboration with the University of Queensland (2006-2010)/ the University of Adelaide (since 2011), CBBR has developed a systems thinking model making it the first BR to use that approach (Nguyen and Bosch, 2013).

As a basis for the framework developed, the systems thinking tool of ‘four levels of thinking’ was applied to CBBR. The four levels of thinking model according to Maani and Cavana (2007) describe the four levels (Events, patterns, systemic structures and mental models) where interactions take place and therefore are a supportive tool for identifying all the relevant elements and dynamics of a system (see appendix 3 for summary table on CBBR³). As part of the application of this model, a comprehensive Casual Loop Diagram (CLD) (see appendix 3, systemic structures) of CBBR has been developed visualising the BR’s system and how the different elements interact with one another.

Altogether, the systems thinking framework for CBBR has been further developed and integrated with an adaptive management framework⁴ to provide a continuous and flexible approach to inform managerial and policy decision-making (Bosch *et al.*, 2013a)⁵. This comprehensive framework is *The Evolutionary Learning Laboratory for Sustainable Development* (see figure 3).

¹ See Maani and Cavana (2007) for more details on systems thinking

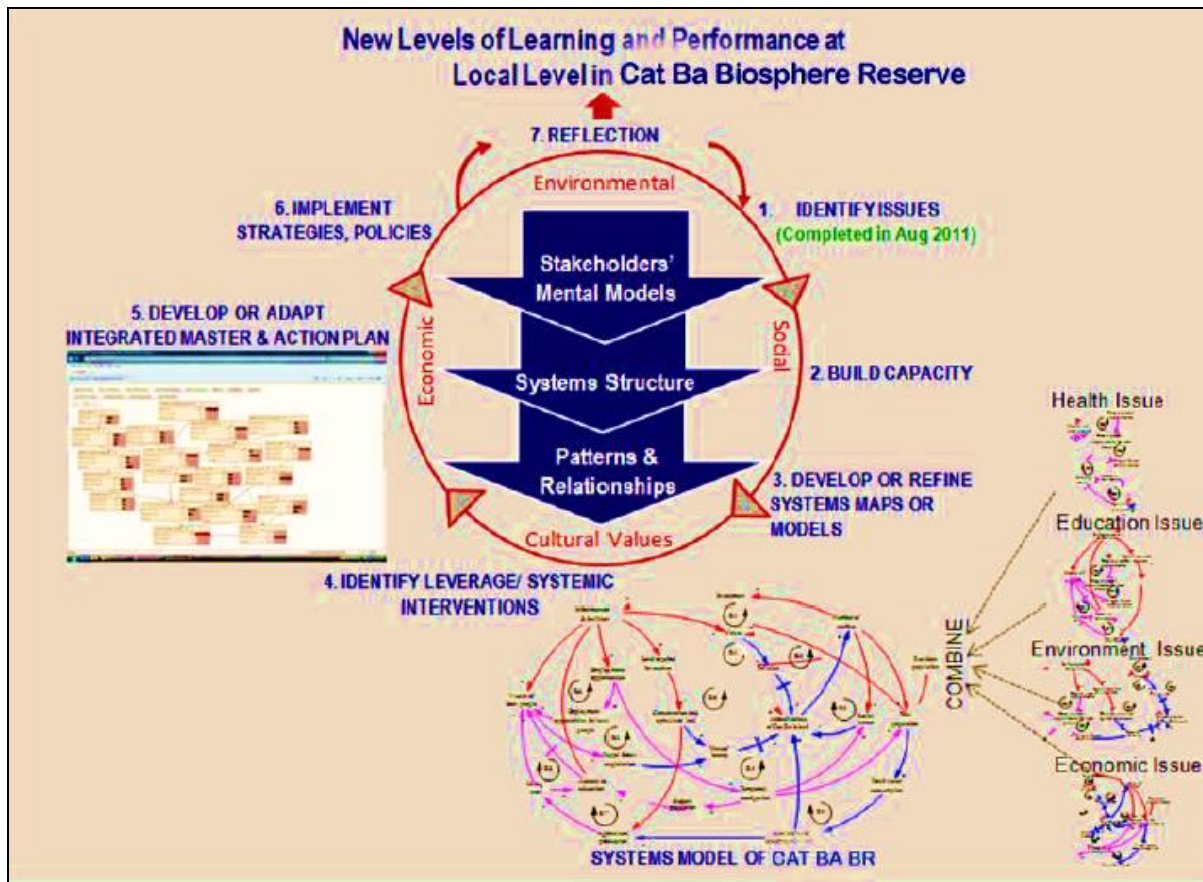
² In the case of CBBR, the MAB VN has identified all the relevant stakeholders for its BRs (see appendix 2)

³ The CBBR four levels of thinking are elaborated in the journal article of Nguyen and Bosch (2013)

⁴ See Bosch *et al.* (2003) for more information on the ‘Adaptive Management Framework’

⁵ For more detailed information on the systems thinking approach for CBBR consult the following documents: Nguyen and Bosch, 2013; Bosch *et al.*, 2013a, 2013b; Nguyen *et al.*, 2012; Nguyen *et al.*, 2011; Thanh and Bosch, 2010; Nguyen *et al.*, 2009; Bosch and Tri, 2009; Bosch *et al.*, 2007a, 2007b.

Figure 3: The Evolutionary Learning Laboratory for Sustainable Development⁶



(Source: CBBR, 2014)

⁶ The different ‘steps’ of the model are elaborated and summarised in the two following articles: Bosch *et al.*, (2013a) and Bosch *et al.* (2013b)

3.3. Social Capital – Adding another Dimension to Systems Thinking

3.3.1. Defining Social Capital

The OECD (2001) defines social capital as “*networks, together with shared norms, values and understanding which facilitate cooperation within and among groups*”. The four main pillars of social capital are:

Social Capital shapes the quantity and quality of our social interactions within and across any community (WB, 2011; Putnam, 1993). It is a critical resource, which appreciates diversity and facilitates collaboration and cooperation fostering stronger communities by enhancing community resilience, economic wellbeing, equality, human capital, productivity and civic engagement (OECD, 2001; Roseland, 2001; Putnam, 2000).

- **Shared Understanding** – describes common standards, expectations and beliefs which are based on common values and norms
- **Trust** – describes the expectation that other members of the community will be honest and cooperative
- **Reciprocity** – describes the community’s people’s will to support one another, to mutual exchange with the confidence that it will be returned in the future
- **Networks** – describes how people and/or groups are linked through different types of ties; bonding (close strong ties within the community), bridging (horizontal ties across communities) and linking ties (vertical ties between communities with differing power and authority)

Based on these characteristics of social capital, the social capital approach is asset-based and focuses on inclusive, participatory and multi-stakeholder processes. Those democratic elements of the social capital are crucial to maximise a community’s potential as it creates a sense of ownership for the members of the community and enables them to become agents for sustainable development themselves (Roseland, 2000). Therefore, social capital has been identified as crucial aspect to sustainability (see e.g. Barnes-Mauthe *et al.*, 2014).

3.3.2. Social Capital and Systems Thinking

Considering both of the theoretical concepts of systems thinking and social capital, it becomes clear that these two approaches link in well with each other. Adding social capital as an additional dimension can help to overcome the ‘barrier of communication’ of differing mental models (Bosch *et al.*, 2013b) as it builds community capacity.

This becomes evident when comparing the framework for application of systems thinking (Appendix 4) with the social capital approach. Both focus on participatory multi-stakeholder approaches trying to gain a better understanding of the complexity of a system or human relations in order to gain greater understanding. Consequently, when combining the two there will be some overlapping information but they will also complement each other as the systems thinking perspective provides information on the system as a whole and its elements whereas a social capital lens highlights the human relations factors within the same system.

Furthermore, when considering the ‘four levels of thinking’, Bosch *et al.* (2007a) argued that the beliefs, values and understanding – the fourth level of the mental models - “*generally remain*

obscure limiting our collective understanding of issues and hence impeding meaningful communications and development of common vision and action” (p. 59). This is where social capital becomes invaluable since it helps make those aspects more visible facilitating the creation of more common understanding, vision and action. Social capital could then be considered as an underlying factor/ element to systems thinking. For instance, by introducing social capital when mapping the human relationship system, in addition to systems thinking, would likely add another dimension highlighting the flow of the relationships, which form part of the overall system. The idea is that social capital can provide an additional source of information on the human inter-relationships and could potentially highlight ‘gaps’ and opportunities by analysing the same system through a different ‘lens’.

Also, when considering social capital as a resource and asset, increasing a community’s capacities and resilience, focussing on increasing social capital can be beneficial to the ELLab ‘cycle’ developed for CBBR as higher social capital would increase levels of participation and capacities of different stakeholders which would be beneficial for different parts of the framework. Similarly, the involvement of multiple stakeholders in developing the ELLab Framework is very likely to have increased the social capital of the stakeholders who have been involved in the process. This becomes evident in the next part of this case study when analysing CBBR’s activities through the social capital lens (see point 4.).

4. Social Capital in CBBR Outcomes

4.1. Social Capital and Biosphere Reserve Functions in Cat Ba Archipelago BR

Table 1 (the Social Capital Matrix) shows the social capital elements (A. Networks, B. Shared Understanding, C. Reciprocity and D. Trust) and the corresponding activities of CBBR (appendix 5), which have generated this form of social capital and further explained through column 2 and column 3. The last column adds in the information on which of the three BR functions have been addressed through this activity.

This table is to demonstrate the social capital and what form of social capital (elements) has been generated through which activities. This table reveals that CBBR has accumulated and created a lot of social capital already.

Included in the table, and identified with the relevant sections, are responses from the Social Capital Questionnaire sent out to the CBBR team, local businesses and community members.

Table 1: Social Capital Matrix: activities and projects in Cat Ba Archipelago Biosphere Reserve*†

A. Networks			
CBBR Activity	Activity	Social Capital	Biosphere Reserve Function
Relationship with Donors	13	Linking	Sustainable Development
Cooperation within the UNESCO regional & thematic BR networks	7	Bridging & Linking	Logistic Support Function
Participation in international networking events	11	Bridging & Linking	Logistic Support Function
Peers support with other international BRs	7	Bridging	Logistic Support Function
Peers support with other national BRs	8	Bonding	Logistic Support Function
International MOUs	3	Bridging	Logistic Support Function
CBBR as Learning Laboratory (LLab) for Sustainable Development	Multiple connections	Bonding, Bridging & Linking	All 3 functions
Systems Thinking (as Management approach) – developed in collaboration with Universities	Multiple connections	Bridging & Linking	Logistic Support Function
International Conference on Systems Thinking	Multiple connections	Bridging	Logistic Support Function
Intersectoral Coordination - Stakeholder	Multiple connections	Bridging & Linking	All 3 functions

participation			
Involvement of representatives of all four government levels	Multiple connections	Linking	All 3 functions
Community Learning Centres (CLCs)	Hundreds of connections	Bonding	Conservation
BREES initiative	Multiple connections	Bonding & Bridging	Sustainable Development
Collaboration with various research institutes and scientists on studies and conservation	Multiple connections	Bonding & Bridging	Conservation function
Community-based forest protection initiative	Multiple connections	Bonding & Bridging	Conservation
Cat Ba Langur Conservation Project	Multiple connections	Linking	Conservation
Community Involvement	Multiple connections	Bonding & Bridging	All 3 functions
Multi-stakeholder approach: Community-based Ecotourism	76	Bridging	Sustainable Development
Sustainable Development Fund	Multiple connections	Linking	Sustainable Development & Conservation
Business Club of BR Label Enterprises	18	Bridging	Sustainable Development
(20 Rows)			

B. Shared Understanding			
CBBR Activity	Activity	Social Capital	Biosphere Reserve Function
Partnerships with international and regional, national BRs and organisations	Knowledge exchange/ Mutual exchange & assistance	Norms & Values	All 3 Functions
University Partnership for Management Approach	Governance	Norms & Values	Logistic Support Function
Systems Thinking approach and SLIQ approach	Governance	Norms & Values	Sustainable Development
Learning Laboratory (LLab) for Sustainable Development	Governance	Norms & Values	Logistic Support Function & Sustainable Development
CBBR-specific Agenda-21	Governance	Norms & Values	Sustainable Development
Applied Partnership Theory	Governance	Norms & Values	Conservation & Sustainable Development
Intersectoral Coordination	Governance	Norms & Values	
Management Board of CBBR	Governance	Norms & Values	All 3 Functions
Biosphere Reserves for Environmental and Economic security (BREES) initiative in CBBR	Training	Norms & Values	Conservation

tourism, agriculture, forestry and fisheries			
Formal and informal environmental education	Training & knowledge exchange	Norms & Values	All 3 Functions
Stakeholder's perceived understanding and community awareness	Community awareness	Norms & Values	All 3 Functions
Community Involvement and Cohesion	Knowledge exchange	Norms & Values	All 3 Functions
Local knowledge and cultural tourism	Knowledge exchange	Norms & Values	All 3 Functions
Community - based Forest Protection <i>Forest Protection Clubs</i>	Training	Norms & Values	Conservation
Cat Ba Langur Conservation Project	Community-based conservation	Norms & Values	Conservation
Biosphere Reserve Certification	Branding	Norms & Values	Sustainable Development & Conservation
Sustainable Development Fund	Investment	Norms & Values	Sustainable Development & Conservation
(17 Rows)			

C. Reciprocity			
CBBR Activity	Activity	Social Capital	Biosphere Reserve Function
Long-standing collaborations with various international and national organisations	Partnerships & Knowledge Exchanges	Mutually Beneficial outcomes	All 3 functions
National BR Network	Thematic Exchanges	Mutually Beneficial outcomes	All 3 functions
Conservation projects and programmes	Research	Mutually Beneficial outcomes	Conservation
Multi-stakeholder approach Community-based Ecotourism	Economy	Mutually Beneficial outcomes	Sustainable Development & Conservation
Business Club of Biosphere Reserve Label Enterprises	Branding	Mutually Beneficial outcomes	Sustainable Development & Conservation
Collaboration with Queensland University/ Adelaide University	Research	Mutually Beneficial outcomes	Logistic Support Function
MOUs with BRs in France and Korea	Partnerships	Mutually Beneficial outcomes	All 3 functions

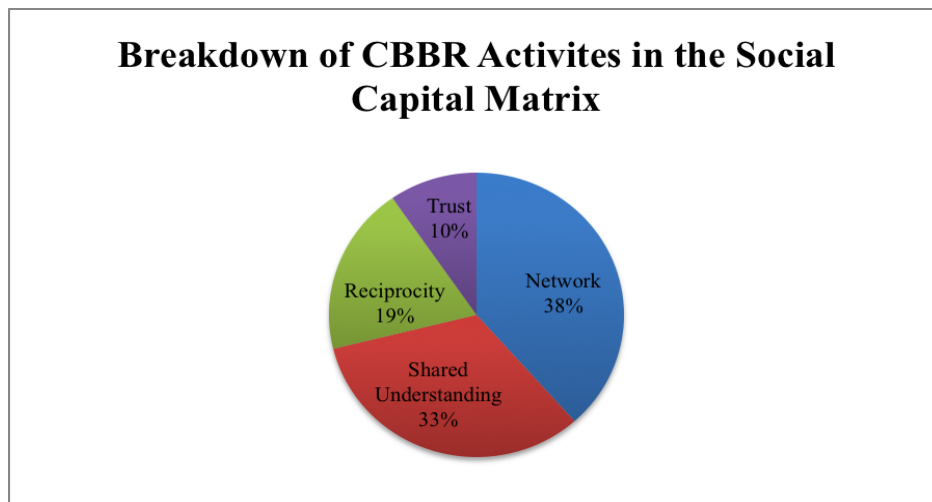
Community Involvement and CLCs	Knowledge Exchanges	Mutually beneficial outcomes	All 3 functions
Perceived reliability on community	Supportive network of communities	Mutually beneficial outcomes	Sustainable Development
BR label Business Club	Knowledge Exchanges between businesses	Mutuality between businesses	
(10 Rows)			

D. Trust			
CBBR Activity	Activity	Social Capital	Biosphere Reserve Function
<i>'systemic, participatory and cross-sectoral framework'</i>	Share common agenda	Opportunity to interact and learn about each other	Conservation
Applied Partnership	Inclusion	Opportunity to interact and learn about each other	Conservation
<i>Evolutionary Learning Laboratory</i>	Adaptive management	Show people are being listened to	All 3 functions
Community Involvement	Inclusion	Show people are a part of CBBR	All 3 functions
Perceived high level of trust	Supportive network of communities	People feel that they are part of the community	All 3 functions
(5 rows)			

* In the interest of brevity this table has been summarised. The full version is available on request.

† More specific relevant information in regards to the 'Activities' of CBBR have been included in the **Appendix 5**

The social capital matrix on CBBR (table 1) highlights that the BR undertakes a great number of different projects and programmes. The matrix identifies how these activities facilitate social capital. The majority of this activity 73% falls within networking and promoting shared understanding.



Within this context, the ELLab framework is a positive driver for development within CBBR. This is reflected in the questionnaire results where all three stakeholder groups (local community, business club, CBBR team) identified the ‘framework’ or ‘model’ as a strength of the BR (see table 2) as it provides an ‘long-term’ development plan for all stakeholders (Local Community; Business Club) which takes into account the island’s unique landscape (Business Club; CBBR team). Additionally, the management approach is perceived to bring more career opportunities (Local Community) as well as adding value to the local economy through the BR label (Business Club; CBBR team) providing a source of ‘pride’ and fostering ‘social cohesion’ (CBBR team).

Besides those strengths and benefits outlined above, there are also certain challenges CBBR is faced with (see table 2). The CBBR team points out that there are possible contrasts between conservation and development that need to be managed and balanced. Linking in with that are social challenges whereby the community recognises their potential lack of experience and expertise to run businesses within the BR. So, there is the concern regarding the lack human and financial resources, especially, for community development (Local Community, CBBR team). With respect to business activities already taking place, marketing (Local Community; Business Club) and waste management due to increasing tourism, (CBBR team) appear to be of concern to the local stakeholders.

Table 2: Three Stakeholder Perspectives on the Strengths and Challenges of CBBR

Stakeholder	Strengths / Main benefits of CBBR	Challenges / Disadvantages of CBBR
<p>Local Community</p> <ul style="list-style-type: none"> - communes/ community associations 	<ul style="list-style-type: none"> - Cat Ba's beautiful nature - My commune has the best mangrove, forest on karst hill, caves - Abundant seafood of finest special quality - Unique local costal lifestyle of Vietnam - More training and career opportunities - BR brings long-term development goals for all, future-oriented 	<ul style="list-style-type: none"> - Island area with distant from mainland - Inadequate support for community-based ecotourism - Community lack of experiences and expertise in self-running businesses - Few vocational trainings - Inadequate marketing for BR businesses, especially community businesses - Lack of funding for local community activities
<p>Business Club</p> <ul style="list-style-type: none"> - those who received the CBBR logo 	<ul style="list-style-type: none"> - Good for the long-term development for all - Support building a of high quality service sector for local island - A framework to appreciate and wise use of the area's scenic landscape and pristine environment - Brings more customers - Make use of the logo reputation of the world BR to add value to businesses/ 	<ul style="list-style-type: none"> - Still limited information and marketing on the BR businesses - Connecting with international tour channels for high class tourism development in Cat Ba BR
<p>CBBR team</p>	<ul style="list-style-type: none"> - A model for sustainable development at a particular/practical landscape level - Created added value through BR branding - Fostering research in natural and social - Creating pride of place and social cohesion - Supporting international knowledge and expertise 	<ul style="list-style-type: none"> - A mosaic of complex stakeholders and interests - Contain possible contrasts between conservation and development needs - Climate Change (Cat Ba BR is an island and marine site) - Poverty and low rural labour productivity - Unsustainable aquaculture farming - Tourism waste treatment - Lack of resources (human and fund) for research and community development

When asked about the main challenges in the BR, the CBBR team also stated that there is ‘*a mosaic of complex stakeholders and interests*’ (CBBR team, table 2). This became evident when looking at the overall answers to the open questions on benefits and challenges in the BR as shown in table 2. In the priority order ranking of the preferences for different CBBR-related values, the differences between the three stakeholder groups (CBBR team; Business Club; Local community) (see table 3) become more evident.

Besides one value, inter-village collaboration at rank ‘9’, all other values are differently distributed over the ranks. Though, the levels of dispersion differ; for instance, the ‘Protection & Conservation of local animal species’ is ranked as highest value, ‘1’, by the CBBR team whereas the same value is ranked as second-lowest, rank ‘11’, by the Business Club and as a medium value by the Local Community ranking it as 6th preference value. Similarly, the ‘Conservation of local culture and ceremonies’ is ranked in the lowest (rank ‘12’ by the Business Club), medium (rank 8 by the Local Community) and the upper (rank ‘4’ by the CBBR team) third of the ranking table.

Though, not all the differences in values are spread out to such a high degree. Tourism and Ecotourism, for example, are both placed by the three stakeholder groups in the upper half. However, the CBBR team and the Local Community value ‘Ecotourism’ over ‘Tourism’ (with rank ‘5’, ‘6’ and ‘12’, ‘11’ respectively) whereas the opposite is the case for the Business Club ranking ‘Tourism’ (rank ‘12’) above ‘Ecotourism’ (rank ‘11’). Similarly, ‘Participation in decision-making’ is valued relatively low with the CBBR team and the Local Community ranking it both at ‘11’ and the Business club ranking it in the middle third at rank ‘5’.

Table 3: Ranking of preferences by three of the main stakeholder groups

Rank	CBBR team	Business Club	Local Community
1	Protection & Conservation of local animal species	Tourism	Ecotourism
2	Protection of the forest	Ecotourism	Tourism
3	Waste Disposal	Short-term income	Protection of Forest
4	Conservation of local culture and ceremonies	Waste disposal	Short-term income
5	Ecotourism	Participation in decision-making	Subsistence fisheries
6	Tourism	Protection of the forest	Protection & Conservation of local animal species
7	Subsistence Fisheries	Shoreline and Mangrove Protection	Waste disposal
8	Shoreline and Mangrove Protection	Commercial Fishing	Conservation of local culture and ceremonies
9	Inter-village collaboration	Inter-village collaboration	Inter-village collaboration
10	Short-term income	Subsistence Fisheries	Shoreline and Mangrove Protection
11	Participation in decision-making	Protection & Conservation of local animal species	Participation in decision-making
12	Commercial Fishing	Conservation of local culture and ceremonies	Commercial Fishing

Source: data collated from the questionnaires

Altogether, the average ranking position of each value is displayed in table 4 with ‘Ecotourism’ and ‘Tourism’ being valued as highest preference by the three stakeholder groups (Local Community, Business Club and CBBR team) overall whereas ‘Commercial fishing’ and ‘Inter-village collaboration’ are the lowest.

Table 4: Mean Ranking Positions of Preferences of Values⁷

1	Ecotourism
2	Tourism
3	Protection of the forest
4	Waste disposal
5	Short-term income
6	Protection & Conservation of local animal species
7	Subsistence Fisheries
8	Conservation of local culture and ceremonies
9	Shoreline and Mangrove Protection
10	Participation in decision-making
10	Inter-village collaboration
12	Commercial Fishing

When respondents were asked about the Community Learning Centres (CLCs) within the individual communes of the BR, all three stakeholder groups considered them as beneficial as they feel that the CLCs improve their knowledge about BR-relevant aspects. Therefore, all respondents make use of the services provided by the CLCs, mainly for training purposes but also for dialogue and tourist activities. Additionally, the CLC are also meant to be a place where the individual communities come together. Though, due to funding issues, the access and availability of consistent training are limited. For that reason, especially the Local Community but also the CBBR team would like to make more use of the CLC and increase the training they provide making the use as well as planning for the CLCs more efficient. Finally, the CBBR team suggested diversifying the use of the CLC which, at the moment, is mainly education-focussed as well as providing general information on the BR.

The respondents all agree that the BR is also beneficial in economic terms as 100 percent of respondents feel that the economic situation as well as opportunities for businesses has improved due to the existence of the BR. The main local product and services identified by the three stakeholder groups are tourism (incl. cave exploration, cliff climbing etc.), (Community) Ecotourism as well as agricultural products such as the Cat Ba honey, the fish sauce as well as Lien Minh Chicken, fish and shrimp farming. Hereby, the Cat Ba honey and the fish sauce are products which have received the Cat Ba BR Label. In general, all respondents believe that the government policies are supportive of the local economy.

When asked to rank the businesses in terms of their presence and, separately, in terms of their importance to the local economy, all answers were identical for both considering (1st) medium-sized, (2nd) small, (3rd) national and (4th) multinational/international businesses in the order named as most present and important.

⁷ The rank of each of the 12 CBBR values has been determined through the calculation of the average from the three rankings by the three stakeholder groups displayed in table 2.

Finally, all respondents also feel that despite their importance to the local economy, businesses could be a potential threat to the BR. The Local Community, CBBR team and the Business Club identified, respectively, pollution, unsustainable production which could harm the natural environment and poor service quality (which could harm the reputation) as potential threats. As solutions, the business club suggested to form a business club of high quality business to provide and disseminate good BR practices in the local economy; the CBBR team suggested that enhanced planning and additional regulations as well as the use of fines and technical innovation would provide the solutions to the potential threat posed by business activities in the CBBR.

5. Social Capital – Social Enterprise and Biosphere Reserve Development Framework (SEBR)⁸

The Social Enterprise and Biosphere Reserve Development Framework document by Assist Social Capital CIC is aimed to be a *living document* flexible and adaptable to different countries and contexts. The framework has been developed with a social capital approach in order to support sustainable development of biosphere reserves through providing a *route map* towards the emergence of social enterprise together with public participation, social investment as well as sustainable public procurement.

These four factors provide the pillars for the SEBR framework and are underpinned by social capital theory and practice promoting sustainable economic development together with social and environmental sustainability. Hereby, all four framework factors are considered to be inter-related as well as inter-connected with one another. An explanation of each of the four factors is given below.

5.1. The Framework Factors

5.1.1. FACTOR 1: Social Enterprise⁹

Social enterprises are distinct from traditional third sector organisations as they strive to be independent of grants and donations. They aim to be economically self-sustainable whilst delivering and reinvesting their surpluses into the business to bring about social and environmental benefits for the wider community whilst also providing space for the development of cooperative relations as well as opportunities and increasing community ownership. This type of social venture is present in almost all economic sector including banking, agriculture and social services. Overall, the social enterprise model is growing internationally and “(...) *in recent decades the SE [social economy] has not only asserted its ability to make an effective contribution to solving the new social problems, it has also strengthened its position as a necessary institution for stable and sustainable economic growth, matching services to needs, increasing the value of economic activities serving social needs, fairer income and wealth distribution, correcting labour market imbalances and, in short, deepening and strengthening economic democracy.*” (Chaves and Marcós Campos, 2008: 6).

5.1.2. FACTOR 2: Social Investment

Social Investments is the provision and use of finance with the aim of generating social and/or environmental as well as financial returns from non-profit distributing organisations. Unlike grants and donations, social investments are loans, used to create social impact with the aim of being eventually paid back. Social investors attribute different values to the mix of social and financial returns they expect, for example it can include the offer of capital without the need for any financial return.

⁸ The SEBR Framework by Assist Social Capital is licenced under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. The original SEBR document is available through Assist Social Capital. For more information please visit the website www.social-capital.net.

⁹ ASC's Executive Director Colin Campbell, together with Silvia Sacchetti, has published two separate journal articles relating to benefits of social enterprises (see Campbell and Sacchetti, 2014 & Sacchetti and Campbell, 2014)

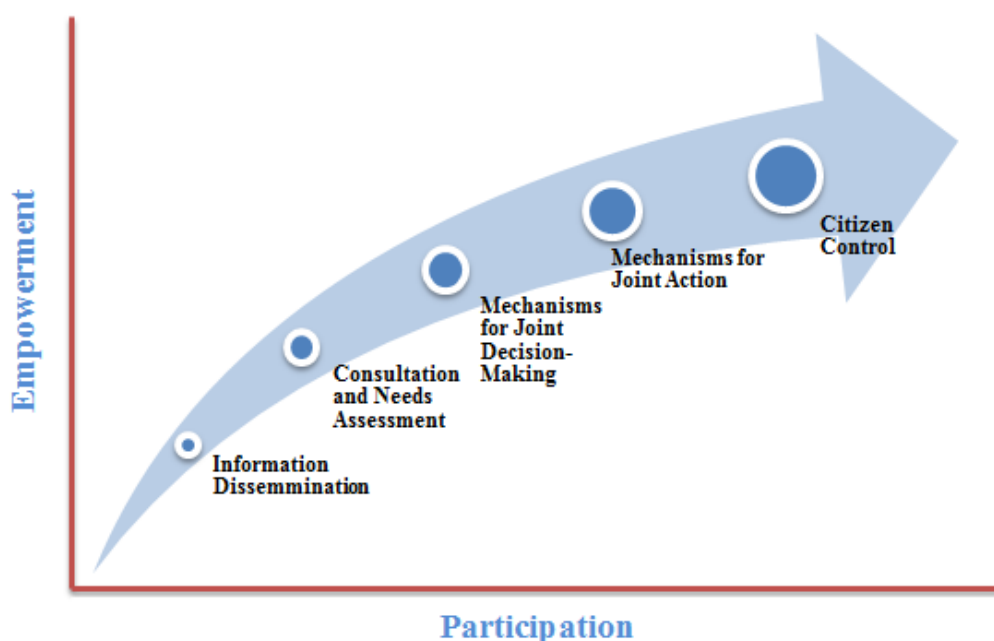
5.1.3. FACTOR 3: Sustainable Public Procurement

Public procurement represents a significant part of a region or a country's public expenditure – with up to 30 per cent - and as such, can be an effective tool in the development and support of the green economy and a sustainable future for all¹⁰. By strategically directing expenditure, the public sector can use its purchasing power as an incentive to sustainable products and services, and encourage innovation across domestic and global supply chains. Sustainable public procurement (SPP) is about facilitating the purchase of goods and services by public sector agencies in a sustainable manner. SPP policies and procedures can deliver benefits within the public sector itself and across society as a whole, such as improving efficiency, reducing energy consumption, reducing costs through preventative spending, improving access to services and securing better human rights, equality and working conditions.

5.1.4. FACTOR 4: Public Participation

Public participation plays a central role in the framework as it supports the emergence of an environment within which enterprises can thrive. Participation is closely aligned with social capital since it is an effective way to extend networks of trust, so crucial to the flow of information and resources. Participatory approaches are based on the value of engaging and empowering citizens to identify local solutions to local issues. There are different levels of participation from the most basic level of information sharing up to community ownership and participatory democracy (see Figure 4). Embedding a culture of participation opens up previously unidentified opportunities for collective action and cooperation. As a result participation can substantially contribute to the aims of BRs to be learning sites for sustainable development and as spaces for experimentation and development of creative ideas.

Figure 4: Public Participation Pathway



¹⁰ See e.g. reports from UNEP (2001, 2013) on sustainable public procurement

5.1.5. Summary of SEBR

Altogether, the framework factors provide a multifaceted regional development strategy to maximise local, regional and national resources whilst each of the factors contributes to the creation of the space to facilitate sustainable development.

Table 5: Summary of the Four SEBR Framework Factors

A Biosphere Reserve (BR)			
Vision	Factors	Objectives	Outcomes
<p>'To engender an environment where enterprises with values in harmony with the aims and objectives of BRs can thrive; delivering sustainable economic development which benefits the community, invests in biodiversity and leads to financially independent BRs'</p>	<p>Factor 1 Social Enterprises (Aspiring, emerging and established)</p>	<p>Flexible model for replication in BRs interested in a financially viable model, enabling them to move away from grant dependency</p> <p>Better Understanding of:</p> <ul style="list-style-type: none"> - BRs - social enterprise - public participation and social capital - sustainable public procurement 	<ul style="list-style-type: none"> • Increased financial independence and space for innovation • Creation of short supply chain supportive of biodiversity and ecosystems • Increased enterprise opportunities for green economy • More local job opportunities in green economy • Increased cohesion and capacity for collective action • Increased equality • Local ownership & regional identity • Appreciation of cultural and natural heritage
	<p>Factor 2 Social Investment</p>	<p>Increased number of:</p> <ul style="list-style-type: none"> • Viable social enterprises • services being delivered by social enterprises in and around BRs • employment opportunities 	
	<p>Factor 3 Sustainable Public Procurement</p>	<p>Increased:</p> <ul style="list-style-type: none"> • social capital • community participation • social investment pipeline • community benefit in public sector contracts • more effective local supply chain for sustainable economic development 	
	<p>Factor 4 Public Participation</p>		

(Source: ASC, 2013)

5.2. The Four SEBR Framework Factors and CBBR

The SEBR framework can be used to plot the current context in a BR, highlighting local strengths and weaknesses in relation to the four factors¹¹. So, after mapping out the social capital in CBBR, the SEBR framework has been applied in the next step. Table 6 indicates that for each of the four framework factors CBBR already has established some foundations.


In regards to Factor 1, Social Enterprise, the Quality Economy which forms part of the SLIQ approach, provides a strong value-based base to build upon. The focus on conservation and green economic development aligns with the value-based orientation and ideas of social enterprises. Also, the concepts of community-based ecotourism as well as cultural tourism bring in the social objectives of CBBR's economic development objectives. The Cat Ba BR label provides an incentive for CBBR-based businesses to strive for those value-based ideas. Directly linking in with Factor 1 is Factor 2, Social Investment, which provides the financial support and opportunities for sustainable development initiatives in CBBR.

The general involvement of all levels of government, especially, the local authorities in the management of the BR, can provide the necessary support framework from a policy point of view. It is also possible that decisions made in terms of public procurement (Factor 3) could be influenced and informed through this involvement. This provides the necessary top-down element to the CBBR. Conversely, Factor 4, public participation, provides the bottom-up involvement into CBBR. Table 6 indicates that there are various ways and activities in which the communities and its stakeholders can get involved.

Those already established elements of the SEBR factors can be used as the foundation on which potentially future projects and initiatives can build on to strengthen each of them.

¹¹ Once the mapping process in a BR has been carried out an Action Plan can be designed for the particular site. It is likely to take around three years to establish the momentum necessary for this approach to become self-organising and subsequently sustainable into the future.

Table 6: The Four SEBR Framework Factors applied to CBBR

Factor 1 Social Enterprise (aspiring/emerging/established)	Factor 2 Social Investment	Factor 3 Sustainable Public Procurement	Factor 4 Public Participation
<ul style="list-style-type: none"> ▪ Quality Economy (SLIQ) • Conservation-based economic development; green economy • Adding value to businesses through the Cat Ba BR Label (see figure 5) • Business Club for CBBR labelled businesses <p>Figure 5: Cat Ba Biosphere Reserve Certification Label</p>  <p>(Source: CBBR, 2014)</p> <ul style="list-style-type: none"> ▪ Community-based Ecotourism and Cultural Tourism 	<ul style="list-style-type: none"> ▪ Sustainable Development Fund • Aim: mobilisation of funds for Sustainable Development innovation and conservation initiatives • Attracts participation and provision of funds by governmental agencies, institutes, private businesses, NGOs, local communities 	<ul style="list-style-type: none"> ▪ Involvement of all four levels of government representatives • Government is responsible for joined-up Planning and Policy Development <ul style="list-style-type: none"> ▪ CBBR management board • The coordination role of the board lies with the local authorities and is made up of board member from various relevant government departments <p>E.g. Community-based forest protection – patrols are financed through the government</p>	<ul style="list-style-type: none"> ▪ LLab for Sustainable Development • ‘Systemic, participatory and cross-sectoral framework’ ▪ Systems Thinking approach • Involves various stakeholders for substantiation of models ▪ Intersectoral coordination with stakeholder involvement (SLIQ) ▪ Building of networks within and out with CBBR ▪ Emphasis on applied partnership theory for community participation & Quality Economy (SLIQ) ▪ Community-based Ecotourism ▪ CBBR-related community meetings and groups ▪ CLCs • Provision of training to the CBBR’s communes ▪ BREES Initiative • Involved training of teachers, school students, CLCs and local journalists on climate change and environmental quality ▪ Community-based nature conservation e.g. forest protection; Cat Ba Langur conservation; customary and local knowledge in conservation of non-timber forest plant use
<p>⇒ The Quality Economy is value-based and as such could potentially act as a facilitator/base for developing social enterprises within CBBR and its communities</p>	<p>⇒ Funds like these can act as facilitators to develop a valued-based economy.</p>	<p>⇒ The involvement of government in the management of CBBR can support/inform the agencies decision-making</p>	<p>⇒ The involvement and education of multi-stakeholders of the CBBR provides opportunities and a platform for public participation and network building across and beyond the whole CBBR community</p>

6. Discussion and Recommendations

The SEBR framework and Social Capital Matrix analysis on CBBR show clearly that CBBR is highly successful at delivering the 3 key functions of a BR. The comprehensive systems-based ELLab framework and its continuous development for CBBR not only provide an approach to sustainable development within the BR, but also facilitates social capital.

The success of ELLab is evident from the fact that CBBR's approach has been replicated across the Vietnamese BR network. In addition, the Haiphong government is interested in implementing the approach at the local governmental level as outlined in the article *"Using the Evolutionary Learning Laboratory Approach to establish a World First Model for Integrated Governance of Haiphong, Vietnam"*

This wider reach of CBBR's ELLab is an indicator of its success as well as of the multi-stakeholder approach. It also reflects the extensive and deep shared understanding of the aims and objectives of the BR. Through its participatory mechanisms and processes an extensive network of relationships has emerged, many of which are reciprocal such as the MOUs with other biosphere reserves or the partnership with the Australian universities. In particular, the research team from Prof. O.J.H. Bosch has brought in academic and theoretical expertise and matched them with the practical experiences of CBBR to develop the ELLab framework. Additionally, those gained insights and expertise are then shared on a national level through the Vietnam BR network.

On the community level, the participatory approach to inform the ELLab framework has been important as well as the extensive educational inputs through formal as well as informal channels. Formally, Vietnamese universities have been involved in environmental education and teachers as well as school students have been involved through the BREES initiative, for example. The trainings provided through the CLCs (like the one through the BREES initiative) are an informal channel to disseminate knowledge about the environment and climate change to the wider community. Therefore, the impacts of climate change on the natural and social systems of Cat Ba Island are clearly understood by the inhabitants of the island, which has led to significant success in conserving the natural biodiversity.

Roseland (2000) highlights the importance of education to 'mobilising' social capital (p. 83). CBBR already tapped into that by education at school, community and governance level transmitting a focus on conservation and climate change awareness, for example utilising existing infrastructures already build up. The benefits could be further extended by using it for potentially social enterprise education and further increasing public participation.

Investing in developing an extensive ecosystem of relationships amongst a diverse local, national and international stakeholders provided a thriving platform for social capital to emerge. The higher levels of inter-commune cooperation, intra-village communication/trust and personal involvement in BR activities, as evidenced through the questionnaires, indicate a virtuous circle whereby a sense of ownership for the local citizens is produced and at the same time leads to the building of community-based management institutions.

In terms of the economy, businesses have been involved through the Quality Economy. CBBR has successfully introduced the Cat Ba BR Logo and charter for local businesses. Social enterprise as value-based businesses could add a complimentary aspect to the Quality Economy by

- ‘Enabling’ communities (see participation pathway)
- Harmonising with the aims and objectives of the biosphere
- Addressing some of the concerns raised regarding insufficient expertise and community development as well as diversification of training through CLCs

The results of the SEBR Framework analysis shows that CBBR has a lot of the elements required for a thriving social enterprise sector in place; high levels of participation, involvement by the public sector an investment fund and a BR Charter indicating the interest in and support for the green economy. However, social enterprise itself is not highlighted as something that would help promote the values within the CBBR Charter.

This Social Capital Case Study indicates that by incorporating social enterprise as a key strategy for future action within the management strategy, CBBR would be extremely well placed to support the emergence of many new community owned enterprises. This could be supported through training events within the CLCs. These new values based businesses would be highly responsive to the challenges the community of Cat Ba island faces (waste management, increasing tourism, conservation and infrastructure, etc.). They would also provide a new methodology to further involving local people through ownership of the social enterprises.

CBBR has already demonstrated its capacity for leadership in the Asia Pacific BR Network, adopting social enterprise, as part of its future strategy, would be another opportunity to become a pioneering biosphere reserve.

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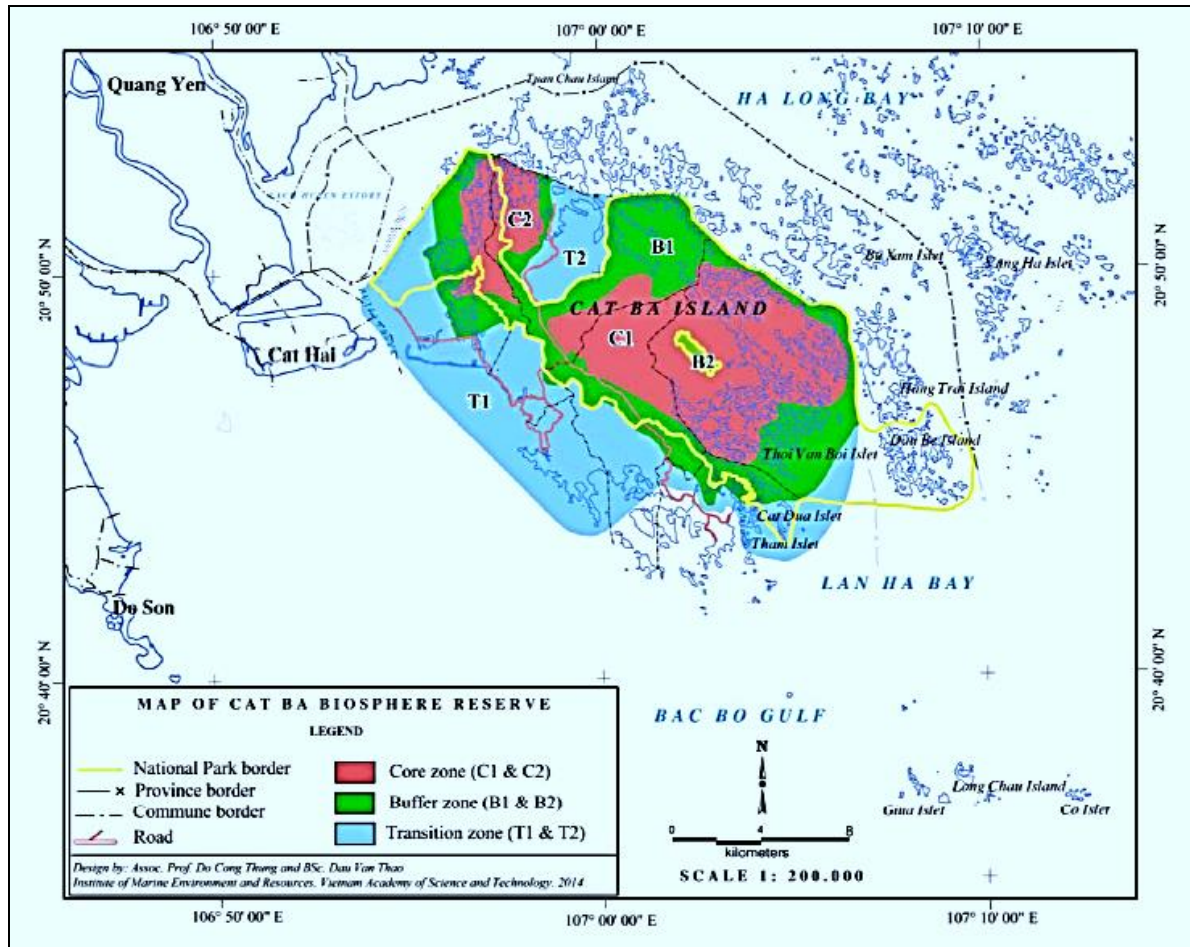
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Appendix 1: Map of Cat Ba and the Three BR Zones

Map 1: Zoning Map of the Cat Ba Archipelago Biosphere Reserve

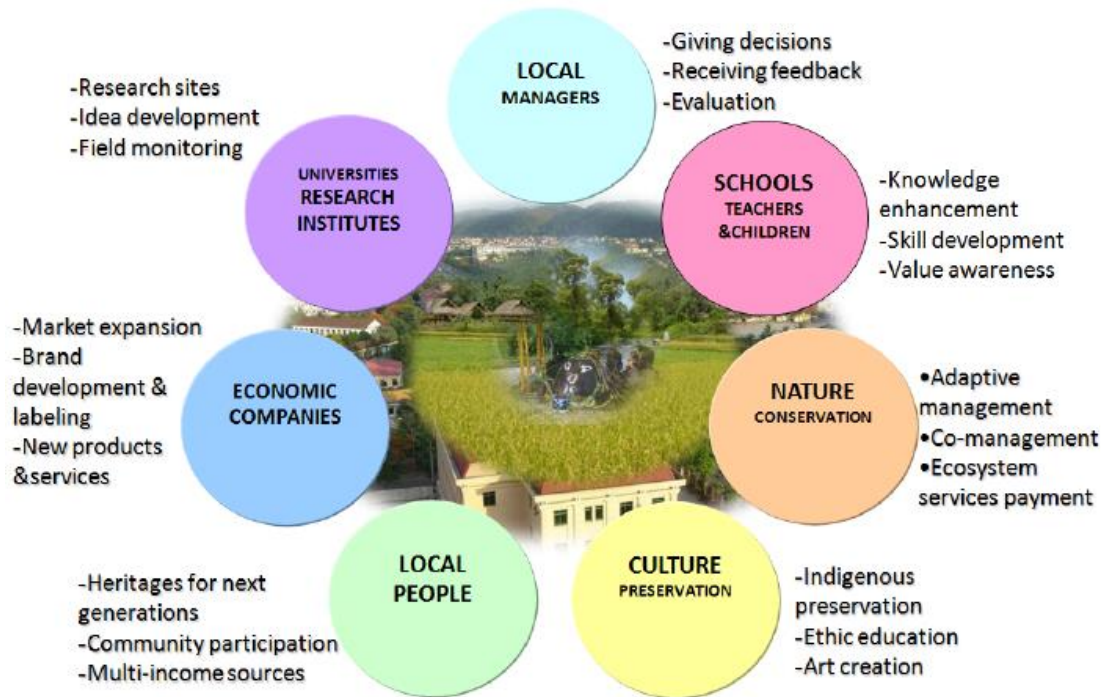


Map 1

(Source: CBBR, 2014)

Appendix 2: MAB VN's graphic on the key stakeholders of its BRs

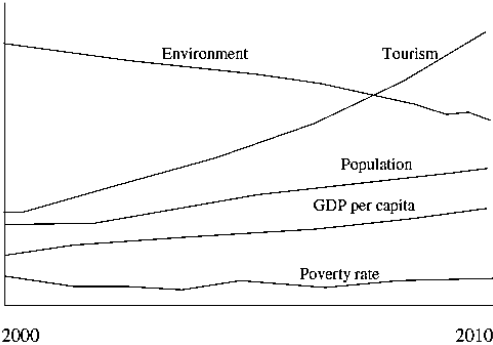
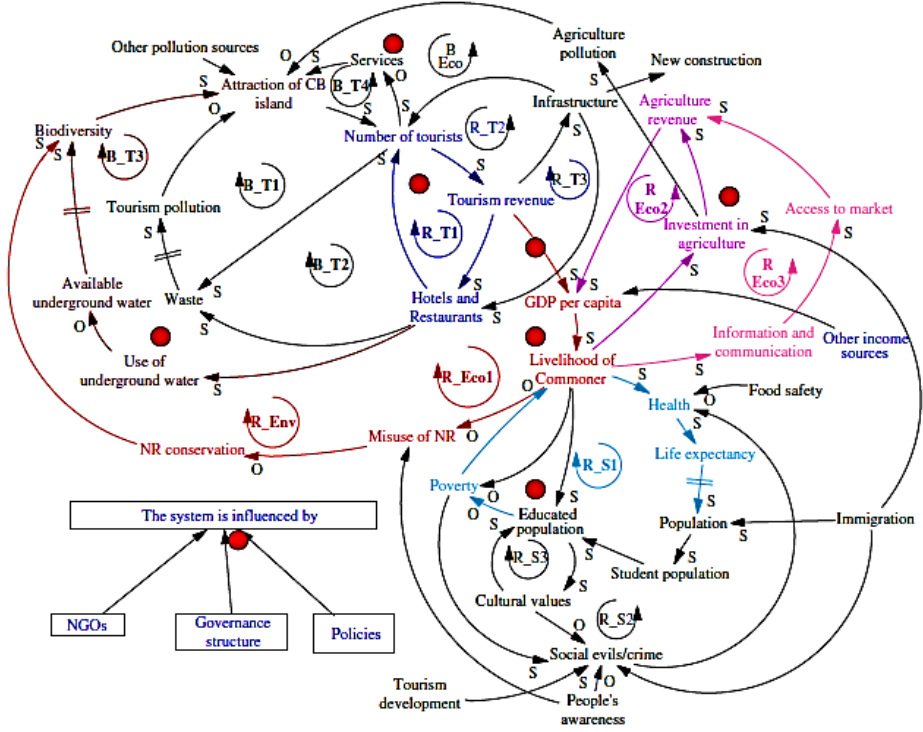
Figure 6: Stakeholders in the Biosphere Reserve, MAB VN



(Source: Nguyen *et al.*, 2013)

Appendix 3: The ‘Four levels of Thinking’ model applied to CBBR

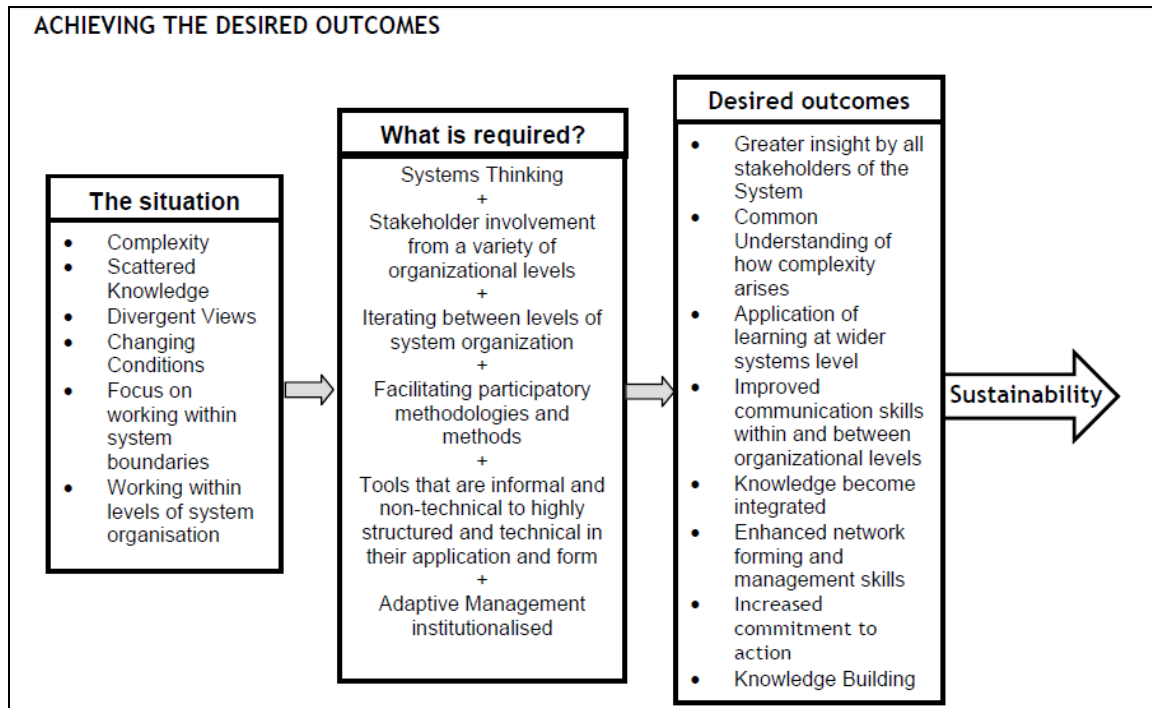
Table 7: Application of the Four Levels of thinking to Cat Ba Archipelago Biosphere Reserve

<p>Key Issues & Events –</p> <p>Highlights current events and challenges</p>	<p>(a) Seasonal typhoons (b) Challenges with waste treatment, pollution, overuse of underground water (c) Lack of fresh water & electricity, insufficient infrastructure, lack of access to suitable markets (d) Uncontrolled tourism development (e) Lack of skilled labour, high number of floating farms (f) Poor econ. Conditions for local people, island communities suffer from poor educational and poor health care standards</p>
<p>Patterns –</p> <p>Represents patterns of events over time</p>	<p>Behaviour over time of some of the key variables of Cat Ba BR</p>  <p>The graph shows five variables over time from 2000 to 2010. Environment shows a steady decline. Tourism shows a sharp increase. Population shows a moderate, steady increase. GDP per capita shows a slight increase. Poverty rate shows a slight decrease.</p>
<p>Systemic Structures (displayed as a CLD) –</p> <p>Interactions & connections between different factors</p>	 <p>The CLD illustrates the complex interactions between various factors. Key elements include: <ul style="list-style-type: none"> Environment (B_T1, B_T2, B_T3, B_T4): Biodiversity, Tourism pollution, Available underground water, Waste, Use of underground water, NR conservation, Misuse of NR. Tourism (R_T1, R_T2, R_T3, R_T4): Number of tourists, Tourism revenue, Hotels and Restaurants, GDP per capita. Agriculture (R_Eco1, R_Eco2, R_Eco3): Agriculture pollution, Infrastructure, Agriculture revenue, Investment in agriculture, Access to market. Livelihood (R_S1, R_S2, R_S3): Livelihood of Commoner, Health, Life expectancy, Population, Immigration, Student population, Cultural values, Social evils/crime, People's awareness. Social/Economic (R_Env, R_S1, R_S2, R_S3): Poverty, Educated population, Tourism development. External Influences: NGOs, Governance structure, Policies. Arrows indicate causal links, with some labeled 'S' (strengthening) and 'O' (weakening). </p>
<p>Mental Models –</p> <p>Reflect beliefs, values, assumptions which shape our behaviour and perceptions</p>	<p>Differences in mental models between key stakeholders of Cat Ba BR - Some examples for different mental models:</p> <ul style="list-style-type: none"> • UNESCO director identifies lack of integrated planning as ‘missing link’ • Cat Ba hotel owner believes uncontrolled tourism development as major issue • Cat Ba ranger believes that conservation alone does not sufficiently support poor locals • Local government official argues that strong collaboration is necessary to succeed <p>⇒ Early involvement of key decision-makers in development process in cat Ba is considered as one of the key factors for progress</p>

(Source: Nguyen and Bosch, 2013)

Appendix 4: Framework for the Application for Systems

Figure 7: Framework for the Application of Systems Thinking concepts that would help achieving outcomes that will contribute to sustainable land management



(Source: Bosch *et al.*, 2007a)

Appendix 5: List of CBBR Activities

I. Relationships with External Bodies

⇒ Overall CBBR has 89 established relationships with national as well as international bodies in the fields of research, conservation and with donors¹²:

Relationships with major donors	⇒ The following organisations are current major donors of CBBR: ZGAP and Muenster Zoo, FFI, UNESCO Office in Vietnam, AFAP, SIDA, AusAID, KAS and CRP, MCD
Other long-standing relationships with organisations	⇒ IUCN, Turku University (Finland), Adelaide University (previously University of Queensland 2006-2010), WWF, ISSS
Cooperation within UNESCO networks	⇒ CBBR is currently involved with the following networks Internationally: UNESCO-MAB; MAB-ICC for BRs; WNBR Thematic networks: WNICBR Regionally: UNESCO Jakarta Office, SeaBRnet, East Asia BR network, North Asia BR network, APBRN
Participation in International Networking Events	⇒ E.g. 2005: Northeast Asia BR Meeting (Korea); 2007: Side Event at UN meeting; 2008: World Congress of BRs (Madrid, Spain); 2008 Global Geopark Event (China); 2012: meetings in Sweden & Thailand; 2013: meetings in Estonia, Japan and the Philippines; 2013: the first APBRN meeting was held in Hanoi (Vietnam)
ISSS, 57 th Annual Conference in Haiphong	⇒ Cat Ba selected as site and case study for 2013 annual conference
Peer support with other international BRs	⇒ CBBR has established mutual partnerships with the following international BRs: Fontainebleau BR (France); Shinan Dadohae BR (Korea); Noosa BR (Australia); Sea Area BR (Finland); Jeju BR (Korea); West Estonian Archipelago BR (Estonia)
International MOUs	⇒ Out of the above partnerships, CBBR has signed 2 MOUs with Fontainebleau BR (France) and Shinan Dadohae BR (Korea)
Peer support with other national BRs	⇒ CBBR has established mutual partnerships within the MAB VN (led by MAB National Committee) network through shared annual meetings and events with all 8 nationally established BRs
Research collaboration	⇒ Collaborative relations with the ISSS and the research team from Prof Ockie Bosch (Adelaide University since 2011/ Queensland University 2006-2010) Includes PhD, Post-doc, Master students for CBBR-specific research
Research institutes and scientists collaborating with CBBR	⇒ There are numerous national as well as international research institutes and scientists working with CBBR for studies and biodiversity conservation , the following are the main institutions: HACEM ¹³ , IMER ¹⁴ , RIMF ¹⁵ , Long Chau Island Hydrological Station, Hon Dau Island Hydrological station, National Hydrological Station

¹² Number provided by the 2014 Periodic Review of the CBBR to UNESCO (CBBR, 2014)

¹³ Hai Phong Centre for Environment and Natural Resources

¹⁴ Institute for Marine Resources and Environment

¹⁵ Research Institute for Marine Fisheries

Institutes collaborating on environmental education	⇒ The following are some examples of the collaborating institutes: UNESCO Vietnam office; Vietnam National MAB Committee; Universities such as Forestry University/ Thai Nguyen University/ Haiphong University/ Hanoi University of Education; MCD, ENV, Pan Nature
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II. CBBR Management Activities

Management Board	⇒ Coordination of CBBR role lies with local/provincial government (Hai Phong) – the management board has members from all relevant government departments for better cross-departmental coordination (established 2005)
Involvement of Representatives of all four levels of government	⇒ The relevant four levels of government in Vietnam are National, District, Provincial Department and Provincial People’s Committee; they are involved in a BRs in order to achieve more joined-up planning and policy development
Encouragement of Research^{16,17}	⇒ Strong support and interest by the local government leaders (Haiphong Municipal Government) in promoting research (management, sustainable development, green growth) and its application in CBBR
A framework for AGENDA-21	⇒ A local, CBBR-specific Agenda-21 framework for sustainable development across the three BR zones has been established
CBBR as LLab for Sustainable Development	⇒ Aim to address challenges as well as development of CBBR through the LLab approach: a <i>‘systemic, participatory and cross-sectoral framework’</i> (launched 2007)
SLIQ mechanism Systems Thinking Approach (S)	⇒ BR approach for MAB VN, CBBR piloted the approach (since 2004) ⇒ The approach is to be developed (academically & practically) and implemented as part of the SLIQ mechanism to support adaptive management (integrated in ELLab framework) (applied since 2009)
Trainings and workshops provided to CBBR management and other relevant stakeholders	⇒ Several trainings and workshops have been through the collaborative partnership with the Australian University: March and October 2007: systems thinking workshop and adaptive management (respectively); trainings and workshops in 2008 and 2009; two workshops in August 2012
Emphasis on Applied Partnership Theory	⇒ This theory is meant to inform the creation of partnerships as part of the SLIQ framework with a particular focus on community participation and the quality economy
Intersectoral Coordination (I)	⇒ As part of the SLIQ mechanism to achieve mutual understanding and participation across state, market and civil society incl. emphasis on <i>interdisciplinary</i> coordination and <i>stakeholder participation</i>

¹⁶ To facilitate the research there are 7 permanent research sites in and near CBBR.

¹⁷ Over 100 research articles have been published (2004-2014) on CBBR, domestically and internationally (see CBBR, 2014).

Quality Economy (Q)	⇒ Initiative started by the government to encourage public-private partnerships to strengthen CBBR-private business relations
Land/Seascape Planning (L)	⇒ Planning and facilitation of zoning of the CBBR under consideration of different ecosystems, natural and cultural values to harmonise conservation and development through geographic planning
Through the UNESCO-MAB networks, CBBR is taking part in specific programmes	⇒ <i>Assistance programmes</i> are provided through UNESCO-MAB and the ICC; in particular on global knowledge on the achievements in poverty alleviation and biodiversity conservation
BREES initiative	⇒ CBBR takes place in this regional project for climate change adaptation, improvement of environmental quality and local poverty alleviation (launched 2011)
Community support infrastructure	⇒ Support services and infrastructure for communes have been improved by ensuring primary health care (each commune has a clinic), access to information and post office (each commune has a post office) and the road system on the island has been renovated

III. Conservation-based Activities

Forest Protection, Marine Conservation as well as conservation of rare and endangered species	⇒ There have been 21 programmes and project implemented to preserve, protect as well as monitor biodiversity (state funded); other research, preservation and development projects/programmes (funded by international donors) have also been implemented
e.g. Ha Long Palm tree	⇒ 2007-2010 breeding and planting programme of Ha Long Palm trees
e.g. Evaluation of rare tree species	⇒ 2009-2010 evaluation of distribution of rare timber trees and conservation recommendations
e.g. Bat Conservation	⇒ As parts of the CLP this project explored the Bat Fauna in CBBR (2006-2007)
e.g. endemic butterfly programme	⇒ Programme for experimentation with techniques to raise rare endemic butterfly species
e.g. Conservation of the Serow	⇒ 2008-2010 evaluation of status and suggestion of measure for conservation; 2012-2015 conservation programme for Serow
New species research and exploration	⇒ Scientific research has led to 9 new species being discovered since 2006

IV. Conservation & Community activities

Community-based Forest Protection	⇒ There are forest protection clubs in all communes located within CBBR as well as Cat Ba town which engage with the community's members; providing patrols and community education on the issue
Cat Ba Langur Conservation	⇒ In cooperation with ZGAP and Muenster Zoo as well as Hai Phong City, this project mobilises local hunters to become active forest and

Project	langur protectors (since 2000)
Customary and local traditional knowledge in conservation	⇒ Focus on utilising practices in non-timber forest plant use for traditional medicine, sustainable decorating etc.

V. Community-based & Educational Activities

Community Learning Centres (CLCs)	⇒ The CLC aim at providing access to information and learning materials as well as providing climate change education; there are CLCs in all of the communes located in CBBR
Environmental Education	⇒ Environmental education in and around CBBR is provided through formal (schools, colleges, universities) as well as informal (general services for general public) channels
BREES initiative: Community Learning Centres & CAPs	⇒ As part of the BREES initiative 97 local residents (divided into four major occupational groups: tourism, agriculture, forestry and fishing) within the CBBR from all the communes received UNESCO's training on <i>Understanding and Responding to Climate Change – Lets Act Together</i> under the supervision of the Ministry of Education and Training & each commune (through the CLCs) created their own CAP
BREES initiative: Training for Teachers	⇒ As part of the BREES initiative 21 teachers were trained in and delivered <i>Teaching and Learning for a Sustainable Future</i> , pilots took place in 7 schools involving 96 students
BREES initiative: Youth for Sustainable Development	⇒ As part of the BREES initiative 150 students (divided into 47 groups) were given the opportunity to contribute to sustainable development through coming up with specific ideas and examples; out of all suggestions 5 received <i>Biosphere Award</i> and their projects were implemented
BREES initiative: Media Professional Training	⇒ As part of the BREES initiative 18 local journalists from radio, TV and print media were involved to promote CBBR's activities producing 5 documentary films, 5 radio broadcasts and 3 news articles

VI. Community & Economy-related Activities

Community-based Eco-tourism	⇒ This tourism concept is based on a multi-stakeholder approach aiming at supporting the local nature and culture; as part of this idea communes are involved to be integrated in eco-friendly, locally-focussed tourism tours
Cultural Tourism	⇒ Use of traditional, local knowledge, customs and festivals as part of the sustainable tourism
BREES initiative on Community and CLCs had representative groups of major occupations	⇒ The representatives of the communes were divided into the four major occupational groups of the CBBR communes: tourism, agriculture, forestry and fishing to inform the processes for community learning and the CAPs

VII. Economy-related Activities

<p>A CLD¹⁸ has been developed for the tourism system</p>	<p>⇒ As part of the (SLIQ) systems thinking's CLD for CBBR, a sub-system CLD has been developed for the tourism loop to inform decision-making in this sector of the CBBR</p>
<p>Biosphere Reserve Certification Label</p>	<p>⇒ As part of the Quality Economy (SLIQ) the label is provided to businesses which comply with the criteria of the CBBR for a conservation-based economic development and quality economy adding value to businesses' products – 18 business have received the label until now¹⁹ (since 2009)</p>
<p>Business Club for Biosphere Reserve Label Enterprises</p>	<p>⇒ The businesses which receive the label have formed this business club</p>
<p>Sustainable Development Fund</p>	<p>⇒ The fund has been formed out of a public-private partnership and has until now received donations (fund amounts to VND 1,5billion) from 12 private businesses, UNESCO trust fund, researchers (e.g. research-specific funding from Australian research team), governmental agencies, NGOs and institutes, local communities (launched 2009)</p>

¹⁸ The CLD has been developed with multi-stakeholder involvement including representatives of the local community, Cat Ba National Park, Local Authority, Transport Supplier, Travel Agents, Hotel/Restaurant Manager, NGOs, Tourism advisor

¹⁹ The 18 businesses which received the BR label: Nha Viet Company - Forest Flower Bee Honey; Holiday View Hotel, Huong Duong Hotel, Prince Hotel, Tùng Long Boat Services, Nam cat Resort, Goi Stream Resort, Sea Pearl Hotel, Hung Long Harbour Hotel, Lepont Hotel, Yen Thanh Hotel, Quang Aah Restaurant, Noble House, Cat Ba Fish Sauce, Lan Ha Hotel, Sun & Sea Hotel, Dream Hotel, Neptune Restaurant)