

Final Report

Six Year Assessment of

The International Research and Training Center on
Erosion and Sedimentation (IRTCES)
under the auspices of UNESCO

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EXECUTIVE SUMMARY

This report concerns the assessment of the International Research and Training Center on Erosion and Sedimentation (IRTCES) by an Evaluation Committee composed of Prof. Dr. Mustafa S. Altinakar and Prof. Dr. Liu Heng.

IRTCES was jointly set up by the Government of China and UNESCO on July 21, 1984, in Beijing, China, as a “Category II Water Center”. The Ministry of Water Resources is the governmental executive agency in charge of IRTCES. Since its establishment, IRTCES has been involved in a wide range of research and training activities directed to solve scientific and engineering problems related to erosion and sedimentation. IRTCES has been engaged in conducting international and domestic technical cooperative research and consulting programs and projects related to erosion and sedimentation; organizing international and national training courses, symposia, and workshops; publishing various scientific journals, newsletters, and other types of scientific documents; promoting various activities related to understanding, measurement, and solution of erosion and sedimentation; and serving as the secretariat of WASER (World Association for Sedimentation and Erosion Research).

The main purpose of this report is (1) to provide an objective assessment of the activities of IRTCES that would allow an informed decision whether the current agreement between UNESCO and the host government, China, should be renewed; and (2) to ensure that the focus and breadth of the activities undertaken and/or promoted by IRTCES are in line with the strategic objectives of UNESCO, in accordance with the new Integrated Comprehensive Strategy for Category II Institutes and Centers (document 35C/22), which was approved by the 35th Session of the General Conference.

Due to the conflict in agendas, the evaluation team members had to meet separately with IRTCES. Prof. Liu Heng visited IRTCES for evaluation on September 9, 2011, and met with Prof. Hu Chunhong, Deputy Director and Secretary General of IRTCES, Prof. Chen Jianguo, Division Chief of the Secretariat, Prof. Wang Yangui and Prof. Liu Cheng, Division Chief and Deputy Chief of Research and Training. During the meeting the activities of IRTCES were discussed and the facilities were visited. Prof. Mustafa Altinakar visited IRTCES on September 15-16, 2011. A formal meeting for evaluation of IRTCES was held on September 16 under the Chairship of Prof. Gao Zhanyi, Deputy Director of IRTCES. Prof. Tan Ying, former Deputy Director of IRTCES, Ms. Tong Yuling, former Deputy Secretary-General of IRTCES, Prof. Liu Cheng, Deputy Chief of Research and Training, and Prof. Wang Zhaoying, Chairman of IRTCES Advisory Council attended the meeting and answered questions. Mr. Hao Zhao, Deputy Division Chief of Department of International Cooperation Science and Technology, MWR, Dr. R. Jayakumar and Ms. Wang Bing from the UNESCO Office in Beijing participated in the meeting as observers. The welcome address and presentation of IRTCES activities were followed by a discussion session that covered activities of IRTCES, budget, funding sources, research projects, training courses and workshops, outreach and dissemination of knowledge, publications, international collaboration and cooperation, future prospects, etc. Evaluators were given various documents to help with the assessment.

Prof. Liu Heng and Prof. Mustafa Altinakar collaborated via email to perform the assessment on the basis of the discussions they had during separate meetings and the documents they received. The following methodology was used to assess the activities of IRTCES and their effectiveness in the light of the existing agreement with UNESCO:

1. Meetings and interviews with the Key Staff of IRTCES
2. Examination of the materials provided by IRTCES (Appendices 1 and 2)
3. Thematic analysis by the evaluation team (Appendix 3)

4. Review of IRTCES web site and relevant material quoted by stakeholders and other organizations
5. Direct interaction of Dr. Altınakar with the students attending a training course at the time of the visit
6. Recommendations to IRTCES, to Government of China and to UNESCO

The detailed analysis on the basis of the data and methodology listed above clearly shows that IRTCES has continued its remarkable achievements during the last six years covered by this assessment.

During the assessment it became obvious that IRTCES is now a key player, both regionally and internationally, in producing and promoting scientific research on erosion and sedimentation and in the application of the findings in a wide spectrum of fundamental and applied disciplines. Equipped also with laboratory facilities, field work capabilities, IRTCES serves as a regional and international center of excellence and expertise, and provides a platform for exchange of scientific and technical ideas and solutions in sediment and erosion research among the scientists and practitioners. IRTCES staff supports government agencies in China and other countries on development and conservation policies, regulations, and investments related to sediment management.

The courses, workshops, and similar activities organized by IRTCES in partnership with UNESCO-ISI and other partners, continue to train hundreds of participants composed of scientists from different disciplines, engineers, managers, stakeholders and decision-makers, and responds to the UNESCO-IHP-ISI objective regarding “Education and Capacity building for Sustainable Sediment management”. IRTCES continues to organize international conferences and symposia, where scientists and practitioners discuss the latest scientific research on erosion and sedimentation, and exchange ideas.

IRTCES has done an excellent job in housing the ISI Technical Secretariat within ITRCES. IRTCES also provides experts to various countries in the region and in the world faced with sedimentation and erosion problems and participates in cooperative research activities.

In fact, during the last six years, on the average, 65% of IRTCES total budget came from funded research projects acquired by the staff. Without their dedication and commitment to bring funded projects, the continuation of the activities of IRTCES could not have been sustained at the present level.

It is also important to underline that, in addition to the work they accomplish in acquiring and performing funded research projects in collaboration with various countries, the scientists at IRTCES contributed significantly to scientific research on erosion and sedimentation. During the last six years, they disseminated their knowledge and findings by publishing an impressive number of journal papers, conference papers, research reports and projects reports in Chinese and English. IRTCES develops and maintains databases on sediment erosion, transport and deposition and makes them available on its website.

IRTCES also fulfills other important functions:

- It acts as Technical Secretariat to the International Sediment Initiative (ISI) of UNESCO-IHP, which leads a global effort to assess the impacts of erosion and sediment transport. In this capacity, IRTCES maintains the information system of ISI, which is a database containing information on rivers, river basins, and significant sediment erosion and deposition case studies, etc.

- It acts as Secretariat to the World Association for Sedimentation and Erosion Research (WASER), and as the Permanent Secretariat of the International Symposium on River Sedimentation, which is a triennial conference series held at different places around the world.
- It publishes the International Journal of Sediment Research (IJSR) and other regular publications and newsletters.

Based on these observations resulting from a detailed assessment of IRTCES, the independent evaluators, Prof. Liu Heng and Prof. Mustafa Altinakar, make the following recommendations to IRTCES, to the Government of China and to UNESCO.

Recommendations to IRTCES

- IRTCES should be congratulated for making outstanding international contributions for the 27 years since its establishment, especially its fruitful achievements within 6 years from re-signing the Agreement between UNESCO and the Chinese Government.
- IRTCES should continue to promote advanced erosion and sediment-related technologies such as soil erosion control, river channel erosion and deposition control, as well as reservoir sediment management in regions of great need, such as Africa, South America, and the Asia-Pacific to solve technical problems in these regions by making use its areas of strength, which are excellent academic and teaching credentials, fundamental and applied research capabilities, expertise in solving sediment related problems and mitigating their impacts, and a proven superior ability to coordinate experts and organizations.
- IRTCES may improve its international fund-raising ability to carry out more international research, training and consulting projects through stronger linkages and cooperation with WB, ADB and other international bodies.
- IRTCES may try to secure additional financial resources to deliver a broader agenda through targeted fundraising in association with the UNESCO family.
- IRTCES should work on promoting stronger linkages with the UNESCO family and other entities to deal with the broad range of issues on sediment-related research, training and knowledge dissemination in water resources management and river basin management.
- The English version of IRTCES web site should be brought to the same level as the Chinese version and the visibility of the website should be increased by providing easier access to its rich contents.
- Access to training materials could be widened by designing online training materials and courses and/or by making video recordings of the training courses available on the website.

Recommendations to the Government of China

- The Government of China should be congratulated for hosting, supporting and promoting IRTCES activities, which make a unique and outstanding contribution to the international community through its activities. The international community is deeply appreciative of the important role played by the Government of China in maintaining and supporting IRTCES as a highly successful, global, water-related category II center working on finding solutions to the erosion and sedimentation problems exacerbated by the population growth, economic problems and the threat of climate change. The Government of China is recommended to:
 - Consider enhancing the financial support for IRTCES activities, in consideration of the commonweal nature of the Center, to allow this highly successful category II UNESCO center to meet the increasing IRTCES' staff salaries, office expenses, and to respond to the growing

demand for its expertise in delivering water and sediment related solutions to developing countries and poor communities in desperate need.

- Consider China's assistance to developing countries for water-related technology projects to be coordinated and implemented by IRTCES, which provides a technically and academically skilled platform with strong international cooperation and collaboration ties.
- Ensure institutional flexibility for IRTCES to effectively operate as an international center of excellence under the auspices of UNESCO.

Recommendations to UNESCO

- UNESCO should pay special attention to the remarkable achievements of IRTCES in its 27-year existence as a category II center in promoting dissemination and advancement of sediment-related knowledge through its research, training, cooperation and communication.
- Considering the excellent achievements of IRTCES, continue the operation of IRTCES as a key category II center under the auspices of UNESCO.
- Provide necessary support to IRTCES to secure financial resources for delivering the UNESCO agenda in developing countries, which are faced with ever increasing water and sediment related problems. In the less developed countries of Africa, South America, and the Asia-Pacific region with serious sediment problems, UNESCO technical assistance projects should be carried out with cooperation of the country by making full use of the proven superior capabilities of IRTCES in the areas of research, training, technology transfer, and technical consultation.
- Provide daily running costs of ISI Technical Secretariat to ensure that it can carry out its tasks sustainably.
- Where appropriate, decentralize resources to IRTCES to deliver project based mid-term strategy outcomes in IRTCES's areas of competence in consultation with the member states.
- Ensure greater synergies between UNESCO mid-term strategy such as the upcoming International Hydrological Program (Phase VIII) and strategic plans of IRTCES in sediment management.
- Develop knowledge-sharing platforms to provide ready access to IRTCES products to member states.
- Promote networking, collaboration and projects based on partnerships among UNESCO category II centers by operating new integrated strategy as approved by the 35th session of the General Conference (document 35 C/22).

PROGRAM DESCRIPTION

UNESCO has established a number of category II centers in the field of water management. Category II centers are not directly part of UNESCO, but they are closely associated with it through agreements approved by the general conference. Category II centers serve as international and/or regional centers of excellence and expertise to provide services and technical assistance to the member states and cooperation partners, and to UNESCO field offices.

The International Research and Training Center on Erosion and Sedimentation (IRTCES) is one of the category II water centers of UNESCO. In this respect, IRTCES is expected to strive and contribute for attaining the strategic objectives and programmatic priorities of the International Hydrological Program (IHP) of UNESCO. As a category II center, IRTCES is expected to (1) contribute to UNESCO-IHP's program through capacity building by enabling and facilitating information exchange, theoretical and applied research, professional training, and other activities in the area of erosion and sedimentation; (2) contribute to technical contribution among developing countries; and (3) serve as experts to help member countries to solve their problems in relation with erosion and sedimentation.

The International Research and Training Center on Erosion and Sedimentation (IRTCES) was jointly set up by the Government of China and UNESCO on July 21, 1984, in Beijing, China. The agreement was renewed on November 30, 2005. The Ministry of Water Resources is the governmental executive agency. The geographic orientation of IRTCES is defined as global. Focal areas are sediment transport and management, water and environment, integrated water resources management, mathematical modeling, and water education. The scope of activities covers vocational training, postgraduate educations, continuing education, research, institutional capacity building and advising/consulting. The principal sources of financial support are the Ministry of Water Resources of the Government of China, and IRTCES itself for services rendered as performing funded projects and/or providing expert advice. UNESCO may provide a limited financial assistance on an ad-hoc basis.

The objective of IRTCES is *to strengthen research and training activities and technical cooperation to solve scientific and engineering problems in the field of erosion and sedimentation.*

The vision of IRTCES is officially defined as:

"IRTCES aims at the promotion of international exchange of knowledge and cooperation in the studies of erosion and sedimentation problems. IRTCES provides technical services in sediment information exchange, training of sediment engineers and consultation on sediment management, erosion control and environmental and ecological protection of watersheds."

The mission statement¹ defines the key functions/activities of IRTCES as follows:

- To promote scientific research on erosion and sedimentation (including sediment transport theory, fluvial/coastal and reservoir sedimentation, sedimentation engineering, soil erosion, soil and water conservation, environmental and ecological impacts of sedimentation).
- To provide technical advisory services and to create a mechanism for the exchange of scientific and technical information on the results of research among experts in various countries.

¹ Brochure of IRTCES (the last version, 2009)

- To act as the Technical Secretariat for the International Sediment Initiative, including hosting and coordinating the implementation of projects relevant to sediment, sustainable water management and water environment and ecology;
- To coordinate international cooperative research activities and to establish laboratory and research centers in order to provide facilities for laboratory and field work for the experts from other countries.
- To organize international training courses, symposia or workshops on special subjects and international study tour and lecturing activities.
- To serve as the permanent secretariat for the International Symposium on River Sedimentation.
- To publish the scientific journal International Journal of Sediment Research and other relevant publications.
- To serve as the permanent Secretariat of the World Association for Sedimentation and Erosion Research;

According to relevant terms of the agreement and the new Integrated Comprehensive Strategy for Category 2 Institutes and Centres (document 35C/22) approved by the 35th Session of the UNESCO, it is necessary to carry out a formal review and evaluation before the UNESCO Director-General can renew the existing agreement. The relevant articles of the document 35C/22 are copied below for ease of reference:

A.3 Periodic review and evaluation

A.3.1 The agreement for the establishment of an institute or centre as a category 2 institute shall be concluded for a definite time period, not exceeding six years. The agreement may be renewed by the Director-General in the light of the review in A.3.2 and the evaluation referred to in A.3.3.

A.3.2 At least six months prior to the expiration of the agreement, the Director-General will carry out a review of the activities of the institutes and of the contribution to the Strategic Programme Objectives of the Organization and the Strategy for category 2 institutes and centres approved by the General Conference. He will include the results of this review in his report to the Executive Board on the execution of the Programme.

A.3.3 To facilitate the review, the Internal Oversight Service will consider, in its planned evaluations of the Strategic Programme Objectives (SPO), the contribution of the relevant category 2 institutes and centres to the SPO under review.

This formal evaluation will include the review of the activities of the centre and of the contribution to the Strategic Programme Objectives of the Organization and the Integrated Comprehensive Strategy for category 2 institutes and centres approved by the General Conference. The results of this review should be included in the report to the Executive Board on the execution of the Programme. Unless such a complementarity is determined, a renewal should not be recommended to the Executive Board, and its designation as category 2 centre should lapse.

Such review and evaluation is also required according to the IHP strategy for UNESCO's category I and category 2 water-related institutes and centres (177 EX/INF.9). The purpose of the review is to determine:

- the progress made by the centre in meeting its terms of reference (see attached copies), its stated aims and objectives stipulated in the agreement signed with UNESCO; and

- the degree of success achieved in undertaking the centre’s programme of work to fulfill these Terms of reference (ToR).

Since IRTCES has been in operation for over twenty seven years there is a need for the evaluation to assess whether the centre’s designation as category 2 Centre should continue or lapse.

PURPOSE OF THE EVALUATION

The main objectives of such review is to assess performance of the International Research and Training Centre on Erosion and Sedimentation (IRTCES) with respect to its terms of reference and contributions to the UNESCO mandates and its Strategic Programme Objectives (SPOs), to provide a valuable element for deciding whether the agreement between UNESCO and the host government should be renewed, and to ensure that the focus and coverage of the activities of the Centre are in line with the strategic objectives of UNESCO. The review/evaluation will have the below main objectives:

- Relevance of IRTCES activities to UNESCO’s Medium-term Programme priorities (33 C/4 and 34 C/4) especially in the field of water management (IHP-VI and VII);
- Results achieved by IRTCES, and its contribution to UNESCO’s efforts in achieving respective sustainable water management especially in sediment and erosion fields;
- Quality of coordination and interaction between UNESCO Headquarters, other Water Centres, Field Offices and IRTCES’s partner entities with regard to planning and implementation of programmes;
- Funding details, mechanisms for securing funds and their risks for sustained institutional capacity, and viability, and quality of organizational management and programme implementation systems adopted by IRTCES;
- Identify and propose the needed improvements for the functioning of IRTCES;
- Recommend actions necessary to be taken by the host country and UNESCO; and
- Based on the above points recommend whether IRTCES’s designation as a UNESCO Category 2 centre should continue or lapse.

EVALUATION SCOPE

In order to meet the purpose of the evaluation described above, the following evaluation parameters shall be considered by two independent evaluators (to be appointed in agreement with IRTCES) in the process of designing a detailed analytical framework and writing an appropriate report consistent with the UNESCO reporting mechanisms to the Executive Board.

(a) Relevance of its activities to UNESCO’s programmes as mentioned in purpose section

(b) Results achieved

Assess to what extent IRTCES has achieved its organizational objectives, which is to promote a conducive atmosphere for co-operation through technology and information exchange, education and science and to increase scientific and engineering knowledge about erosion and sedimentation.

(c) Quality of coordination and interaction with relevant entities

- Assess the effectiveness of coordination and interaction with UNESCO Beijing Office and Headquarters (notably with the Water Sciences Division) and other Field Offices; and
- Assess the quality of partnerships with other relevant Category-2 Water Centres.

(d) Funding pattern and quality of organisational management

- Analyze the funding patterns, mechanisms and their risks for sustained institutional capacity, and viability;
- Assess the process by which extra-budgetary resources are sought and obtained and to what extent the extra-budgetary funding is aligned to the strategic objectives of UNESCO; and
- Examine the quality of organizational management and the impact of the extent of functional autonomy provided.

EVALUATION METHODOLOGY

The assessment of IRTCES is performed based on a formal review and evaluation meeting. Due to the conflict in agendas, the evaluation team members had to meet separately with IRTCES:

- Prof. Liu Heng visited IRTCES for evaluation on September 9, 2011. Prof. Hu Chunhong, Deputy Director and Secretary General of IRTCES, presented the history of IRTCES and provided answers to the questions in relation with the activities and achievements of the center. Prof. Chen Jianguo, Division Chief of the Secretariat, Prof. Wang Yangui and Prof. Liu Cheng, Division Chief and Deputy Chief of Research and Training, also attended the evaluation meeting and took part in the discussions. Prof. Liu Heng visited the offices and facilities of IRTCES and received documentation for the evaluation.
- Prof. Mustafa Altinakar visited IRTCES on September 15-16, 2011. On September 15, a brief meeting was held with Prof. Liu Cheng, Deputy Chief of Research and Training, during which Prof. Altinakar received some documentation in preparation of the formal meeting the next day. A formal meeting for evaluation of IRTCES was held on September 16 under the Chairship of Prof. Gao Zhanyi, Deputy Director of IRTCES. Prof. Tan Ying, former Deputy Director of IRTCES, Ms. Tong Yuling, former Deputy Secretary-General of IRTCES, Prof. Liu Cheng, Deputy Chief of Research and Training, and Prof. Wang Zhaoying, Chairman of IRTCES Advisory Council attended the meeting and answered questions. Mr. Hao Zhao, Deputy Division Chief of Department of International Cooperation Science and Technology, MWR, Dr. R. Jayakumar and Ms. Wang Bing from the UNESCO Office in Beijing participated in the meeting as observers. The welcome address and introduction by Prof. Gao Zhanyi was followed by a detailed presentation of the activities of the ITRCES during the last six years by Prof. Liu Cheng. The questions and discussion session covered activities of IRTCES, budget, funding sources, research projects, training courses and workshops, outreach and dissemination of knowledge, publications, international collaboration and cooperation, future prospects, etc. Additional documents were presented to help with the assessment.

Prof. Liu Heng and Prof. Mustafa Altinakar collaborated via email to perform the assessment on the basis of the discussions they had during separate meetings and the documents they received. The following methodology was used to assess the activities of IRTCES and their effectiveness in light of the existing agreement with UNESCO:

1. Meetings and interviews with the Key Staff of IRTCES
2. Examination of the materials provided by IRTCES (Appendices 1 and 2)
3. Thematic analysis by the evaluation team (Appendix 3)
4. Review of IRTCES web site and relevant material quoted by stakeholders and other organizations
5. Direct interaction of Dr. Altinakar with the students attending a training course at the time of the visit
6. Recommendations to IRTCES, to Government of China and to UNESCO

KEY FINDINGS

A detailed thematic analysis of the activities of IRTCES during the last six years is presented in APPENDIX 3 within the framework of the UNESCO, International Hydrologic Program goals, especially Phase VI and VII themes and objectives, and the existing agreement of IRTCES.

Referring to APPENDIX 3, key findings for administrative and financial matters are:

- Considering an average total budget of 3.45 million RMB per year during the last six years, of which only 35% is the operating budget base allocated by the Government of China, IRTCES has been operating extremely well and has accomplished all its objectives and responsibilities under the existing agreement with UNESCO and within the framework of IHP-VI and VII program themes and activities.
- It is remarkable to note that, on the average, 65% of IRTCES total budget has been secured by the staff from external funds in the form of funded projects. All the funded projects are in full alignment with the strategic objectives of UNESCO-IHP, phases VI and VII.
- Over the years, IRTCES has been able to attract and maintain a world class, highly skilled expert staff with great dedication to the achievement of the objectives. This workforce with world renown achievements must be maintained and strengthened for ensuring the continued success of IRTCES, which plays a unique role globally and regionally in the area of erosion and sedimentation.
- The erosion and sedimentation problems continue to be a major issue globally, but especially for the developing countries that need extensive technical assistance and capacity building for creating a critical mass of well trained professionals that can tackle these technical problems with important economic and social impacts. The demand in technical assistance and capacity building is even increasing due to anthropogenic effects of population increase and the impact of the global climate change. Considering also the growing costs of salary, operation, research and training, the escalating demands can only be met by an increase in both the funding base through core funds provided by the Government of China and the extra-budgetary resources.

The thematic analysis concerning the activities of IRTCES clearly shows that, since its establishment as a UNESCO category II center, IRTCES has contributed significantly to the achievement of UNESCO-IHP VI and VII strategic goals by becoming a regional and global center of excellence and expertise and a platform of exchange, cooperation, and training in the area of erosion and sedimentation research and applications. The activities accomplished during the last six years has maintained and strengthened the unique leadership role played by IRTCES in

- producing, disseminating new knowledge in the area of theoretical and applied erosion and sediment research and its applications in the other scientific areas through publication of scientific journals, papers, research reports, and organization of conferences, symposia and other meetings;
- providing training and education for capacity building towards sustainable development;
- performing funded research projects in full alignment with its responsibilities defined by the agreement with UNESCO;
- establishing and maintaining erosion and sedimentation related databases that can be accessed online by researchers around the world; and
- encouraging research, exchange of ideas and communication between researchers by serving as the secretariat for WASER (the World Association for Sedimentation and Erosion Research) and the Chien Ning Memorial Foundation for Erosion and Sedimentation which awards the “Chien

Ning Prize for Erosion and Sedimentation Studies” to outstanding sediment researchers and engineers.

Without repeating the detailed thematic analysis results given in APPENDIX 3, the key findings of the review of the activities of IRTCES, their global and regional impact and the significant contributions to strategic goals of UNESCO-IHP can be summarized as follows:

- The achievements in the 27-year development of IRTCES, which is the first established water-related Category II center, received the highest marks for its sediment and erosion-related research, training, conference series of International Symposia of River Sedimentation, as well as the quarterly published International Journal of Sediment Research.
- IRTCES has been working remarkably well during the last 6 years to accomplish its roles and responsibilities defined under the Agreement between UNESCO and Chinese Government, which was renewed in November 30, 2005. The activities accomplished by IRTCES are relevant to the strategic goals of UNESCO-IHP VI and VII and respond to a real need expressed by scientists, engineers and other professionals in the field as well as decision makers. The unique and extremely important role played by IRTCES has also been clearly expressed in evaluation comments and opinions expressed by experts in the field, such as Prof. Sam S. Y. Wang (USA), ISI Steering Committee (UNESCO), Prof. Des E. Walling (UK), Prof. Rollin Hotchkiss (USA), Prof. M. El Motasem (Egypt), Mr. Jose Alberto Zuniga (Costa Rica), Prof. Dou Xiping (China). Considering the mission statement provided in the Chapter “PROGRAM DESCRIPTION”, the following observations are made for IRTCES activities in last six years:
 - IRTCES Staff has contributed to research in erosion and sedimentation by bringing in 60 funded research projects, of which 18 are currently under way. These funded research projects provided, on the average, 65% of the total budget of the Center and allowed financing of the training education activities. In addition, IRTCES performed 25 other research projects and shared their important findings and data by publishing research reports.
 - IRTCES has sponsored 6 conferences, organized 11 seminars and meetings, and co-sponsored 7 other conferences. These conferences provide an important platform that brings experts in erosion and sedimentation research and engineering from all over the world for showcasing their latest research findings and application projects, exchange ideas and shape the future of the erosion and sedimentation research.
 - IRTCES serves as permanent Secretariat of the International Symposia on River Sedimentation (ISRS), which is organized triennially. The 2007 edition of ISRS in Moscow, Russia, and the 2010 edition in Stellenbosch in South Africa attracted about 400 participants in total from 30 different countries. Large participation by experts around the world is a good indicator of the important and increasing role played by this conference as a platform for sharing research findings and exchanging ideas on erosion and sedimentation research and applications.
 - In alignment with the UNESCO-IHP-ISI regarding “Education and Capacity building for Sustainable Sediment Management”, IRTCES has organized seven training courses. These courses trained about 300 participants from more than 30 countries around the world. Many of these are developing countries that are faced with serious erosion and sedimentation problems with significant impact on the economic and social development. The training courses organized by IRTCES constitute an important platform for capacity building and for educating local experts and decision makers who can tackle the problems of erosion and sedimentation in their

respective countries. The lecture notes of these training courses are freely available on IRTCES website.

- IRTCES staff has shared their knowledge and expertise by publishing their research results and expertise in refereed scientific journals and conference proceedings. The total number of published journal papers in both Chinese and English is 208. In addition, a total 62 conference papers have been presented at various international and regional conferences and published in their proceedings. IRTCES staff has also communicated the results of their funded research in 25 research reports. Considering the small number of staff members, this is an impressive achievement by any standard, and IRTCES staff must be commended for their productivity and commitment.
- In order to promote research in the erosion and sedimentation area and contribute to the dissemination of knowledge, IRTCES publishes the International Journal of Sediment Research (IJSR), which is published quarterly, the “China Gazette of River Sedimentation”, which is published annually and contains data from 11 rivers in China, and “UNESCO-ISI Newsletters”, which is published quarterly. The IJSR, with an impact factor of 1.708, is the official journal of both IRTCES and WASER. The IJSR constitutes an extremely important platform for researchers to communicate the results of their research, not only in the mechanics of sediment transport and fluvial processes, but also in geography, geomorphology, soil erosion, sediment yield, soil conservation, environmental and ecological impact of sedimentation, social and economic aspects of sedimentation and its assessment, etc.
- IRTCES has done an excellent job in housing the ISI Technical Secretariat within IRTCES. Appendix 1-21 of the Evaluation Comments and Opinions by “ISI Steering Committee” praises the successful efforts by IRTCES and remarks that “*The ISI Secretariat provides strong support in organizing meetings and workshops around the world and is organizing such events in China in an appropriate way*” and “*The ISI Secretariat and IRTCES have done an excellent job in setting up, operating, and maintaining the ISI Information System. The importance of the Information System is borne out by the many hits to the ISI webpage.*” The ISI Web Pages and Information System has released 360 items of news, 69 notices of coming events, 20 issues of newsletters, 12 reports on case studies, 20 special reports on conferences and training activities, 100 study reports and books, etc., and they have attracted many visitors.
- IRTCES promotes regional and international collaboration and serves as a hub of expertise and exchange for sharing research and data. A number of agreements for cooperation and exchange have been signed with various organizations in different countries. IRTCES has cooperative agreements with numerous research institutes in China, and exchanges information, documents and books with about 60 institutions in China and 84 other institutions in 48 countries and regions around the world. A number of international scholars and delegations visit IRTCES each year to establish contact, to discuss and explore collaborative research and activities, plan for international conferences, symposia, and meetings, and to attend conferences and meetings organized by IRTCES, etc. IRTCES staff has also made numerous trips abroad to interact with their colleagues in various institutions and international organizations, and to give lectures and seminars.
- As a means for promoting high quality research in erosion and sedimentation, IRTCES manages the Chien Ning Memorial Foundation for Erosion and Sedimentation and awards the “Chien Ning Prize for Erosion and Sedimentation Studies” to outstanding sediment researchers and engineers.

- IRTCES serves as the Secretariat of WASER (the World Association for Sedimentation and Erosion Research). IRTCES and WASER activities are complementary and together contribute to the IHP-VI and VII themes and activities.
- IRTCES has built and maintains a series of extremely important databases in the domain of erosion and sedimentation research and practice. IRTCES web site serves also as a global sediment portal providing links to data sources maintained by various organizations around the world.

By providing these extremely important activities and services, IRTCES occupies a unique position both regionally and internationally, which must be continued. Based on the above observations, the following final remarks are in order:

- The efforts that the Chinese Government put into IRTCES as well as the extraordinary efforts and dedication by IRTCES itself should be highly appreciated.
- IRTCES has established an effective operation mode as a UNESCO category II center through its exploration and development for twenty-seven years. It has been playing the role of bridge between research and practice and creating linkages to promote the dissemination, exchange, application and advancement of sediment-related knowledge on a global scale.
- Growing international importance with erosion and sediment-related problems in water resources management and river basin management in many parts of the world demands greater role of UNESCO through IRTCES to strengthen awareness about the importance of erosion and sediment processes and their impacts, to promote exchange of information on relevant data, monitoring and management methods, and to improve sustainable management for soil and sediment resources.

RECOMMENDATIONS

Recommendations to IRTCES

- IRTCES should be congratulated for making outstanding international contributions for the 27 years since its establishment, especially its fruitful achievements within 6 years from re-signing the Agreement between UNESCO and the Chinese Government.
- IRTCES should continue to promote advanced erosion and sediment-related technologies such as soil erosion control, river channel erosion and deposition control, as well as reservoir sediment management in regions of great need, such as Africa, South America, and the Asia-Pacific to solve technical problems in these regions by making use its areas of strength, which are excellent academic and teaching credentials, fundamental and applied research capabilities, expertise in solving sediment related problems and mitigating their impacts, and a proven superior ability to coordinate experts and organizations.
- IRTCES may improve its international fund-raising ability to carry out more international research, training and consulting projects through stronger linkages and cooperation with WB, ADB and other international bodies.
- IRTCES may try to secure additional financial resources to deliver a broader agenda through targeted fundraising in association with the UNESCO family.
- IRTCES should work on promoting stronger linkages with the UNESCO family and other entities to deal with the broad range of issues on sediment-related research, training and knowledge dissemination in water resources management and river basin management.
- The English version of IRTCES web site should be brought to the same level as the Chinese version and the visibility of the website should be increased by providing easier access to its rich contents.
- Access to training materials could be widened by designing online training materials and courses and/or by making video recordings of the training courses available on the website.

Recommendations to the Government of China

- The Government of China should be congratulated for hosting, supporting and promoting IRTCES activities, which make a unique and outstanding contribution to the international community through its activities. The international community is deeply appreciative of the important role played by the Government of China in maintaining and supporting IRTCES as a highly successful, global, water-related category II center working on finding solutions to the erosion and sedimentation problems exacerbated by the population growth, economic problems and the threat of climate change. The Government of China is recommended to:
 - Consider enhancing the financial support for IRTCES activities, in consideration of the commonweal nature of the Center, to allow this highly successful category II UNESCO center to meet the increasing IRTCES' staff salaries, office expenses, and to respond to the growing demand for its expertise in delivering water and sediment related solutions to developing countries and poor communities in desperate need.
 - Consider China's assistance to developing countries for water-related technology projects to be coordinated and implemented by IRTCES, which provides a technically and academically skilled platform with strong international cooperation and collaboration ties.

- Ensure institutional flexibility for IRTCES to effectively operate as an international center of excellence under the auspices of UNESCO.

Recommendations to UNESCO

- UNESCO should pay special attention to the remarkable achievements of IRTCES in its 27-year existence as a category II center in promoting dissemination and advancement of sediment-related knowledge through its research, training, cooperation and communication.
- Considering the excellent achievements of IRTCES, continue the operation of IRTCES as a key category II center under the auspices of UNESCO.
- Provide necessary support to IRTCES to secure financial resources for delivering the UNESCO agenda in developing countries, which are faced with ever increasing water and sediment related problems. In the less developed countries of Africa, South America, and the Asia-Pacific region with serious sediment problems, UNESCO technical assistance projects should be carried out with cooperation of the country by making full use of the proven superior capabilities of IRTCES in the areas of research, training, technology transfer, and technical consultation.
- Provide daily running costs of ISI Technical Secretariat to ensure that it can carry out its tasks sustainably.
- Where appropriate, decentralize resources to IRTCES to deliver project based mid-term strategy outcomes in IRTCES's areas of competence in consultation with the member states.
- Ensure greater synergies between UNESCO mid-term strategy such as the forthcoming International Hydrological Program (Phase VIII) and strategic plans of IRTCES in sediment management.
- Develop knowledge-sharing platforms to provide ready access to IRTCES products to member states.
- Promote networking, collaboration and projects based on partnerships among UNESCO category II centers by operating new integrated strategy as approved by the 35th session of the General Conference (document 35 C/22).

APPENDIX 1 LIST OF MATERIALS EVALUATED

1. Brochure of IRTCES (the latest version, 2009)
2. Brochure of IRTCES (2004)
3. Brochure of IRTCES (1998)
4. Bridge and Linkage, Album for the 25th anniversary of the IRTCES
5. Exploration and Development, 20 years history of IRTCES
6. 10 years development of IRTCES
7. Brochure of Qian Ning Prize for Erosion and Sedimentation Technology
8. Brochure of International Sediment Initiative
9. Brochure of ISI case studies
10. Brochure of WASER
11. IRTCES Web
 - a) International Networks on Erosion and Sedimentation (in Chinese)
 - b) International Networks on Erosion and Sedimentation (in English)
 - c) International Sediment Initiative
 - d) WASER
 - e) Global Data of Erosion and Sedimentation
12. UNESCO-IHP Research Report
 - a) Case study on the Yellow River Sedimentation
 - b) Case study on sediment management and wetland conservation at Yellow River mouth
 - c) Integrated Physical and Ecological Management of Rivers (Phase I)
 - d) Integrated Physical and Ecological Management of Rivers (Final Report)
 - e) Changes in runoff and sediment load in the Pearl River basin and its causes
 - f) Case study on utilization of sediment resource in the lower Yellow River
 - g) Warping dam and its effects on environment, economy and society in loess plateau region of China
 - h) changes in water and sediment loads of rivers in China
13. ISI Newsletter (No. 1-21)
14. Agreements between IRTCES and organizations
 - a) National Center for Computational Hydroscience and Engineering, the University of Mississippi, USA (2004, 2007)
 - b) National Hydroelectric Power Corporation LTD., India (2006)
 - c) Elsevier (2007)
 - d) Universiti Teknologi Mara, Malaysia (2008)
 - e) International Center for Water Hazard and Risk Management, Japan (2009)
15. China Gazette of River Sedimentation (2009)
16. International Journal of Sediment Research (Vol. 26, No.2, 2011)

17. Summary of Field data for Sedimentation in the Three Gorges Project during the Cofferdam Impoundment period (2003-2006)
18. Summary of Field data for Sedimentation in the Three Gorges Project during the Initial Filling period (2006-2008)
19. IRTCES Biennial Report (2006-2008)
20. IRTCES Biennial Report (2008-2010)
21. Evaluation Comments and Opinions
 - a) Prof. Sam S. Y. Wang (USA)
 - b) ISI Steering Committee (UNESCO)
 - c) Prof. Des E. Walling (UK)
 - d) Prof. Rollin Hotchkiss (USA)
 - e) Prof. M. El Motasem (Egypt)
 - f) Mr. Jose Alberto Zuniga (Costa Rica)
 - g) Prof. Dou Xiping (China)

APPENDIX 2 LIST OF HANDOUTS AND ANNEXES PROVIDED BY IRTCES TO THE EVALUATION TEAM

- A-1 Agreement between the Government of the People’s Republic of China and UNESCO concerning IRTCES (2005)
- A-2 Agreement between the Government of the People’s Republic of China and UNESCO concerning IRTCES (1984)

- B-1 List of IRTCES staff
- B-2 Changes of full time staff number
- B-3 Variation of IRTCES budget

- C-1 Member list of the 7th Term of Advisory Council
- C-2 Minutes of the 7th IRTCES Advisory Council Meeting

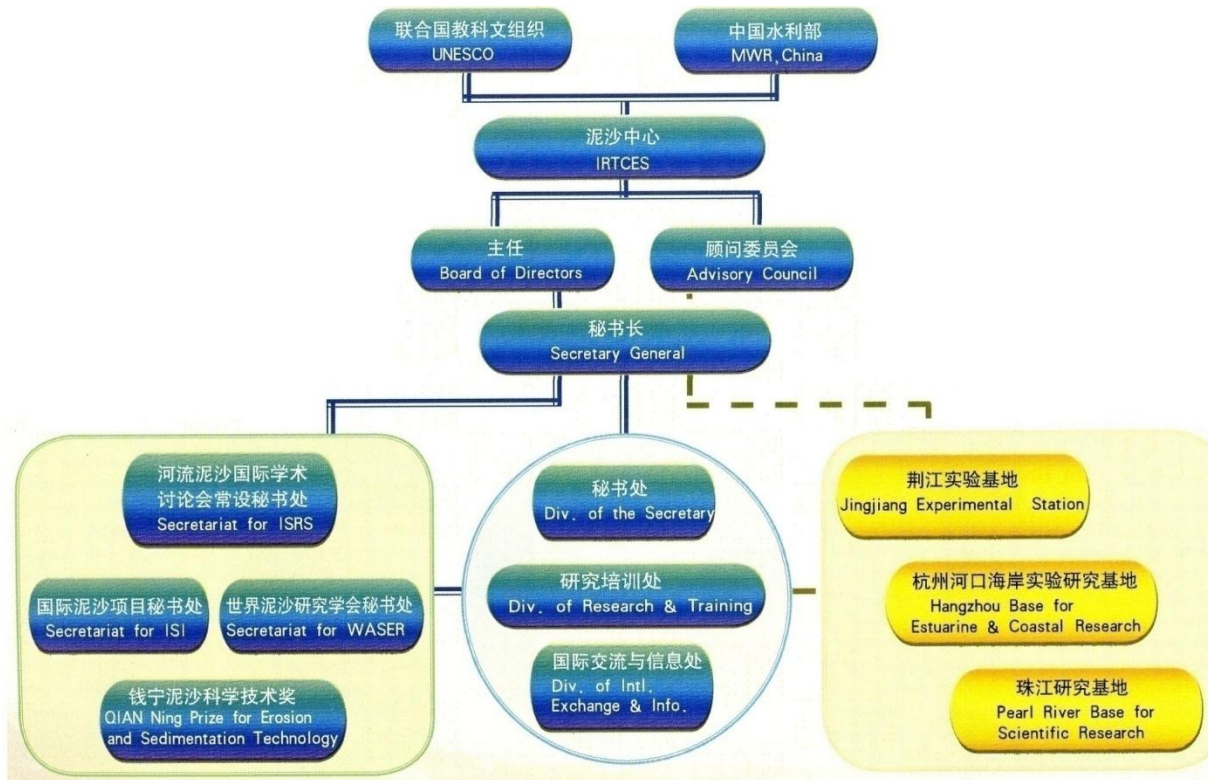
- D-1 Outline of IRTCES activities from 2006-2011
 - Annex 1 List of research projects completed and ongoing
 - Annex 2 List of Training Courses
 - Annex 3 List of International Symposia, Conferences and seminars
 - Annex 4 List of Overseas business trips
 - Annex 5 List of international visitors/groups
 - Annex 6 List of Publications
 - Annex 7 List of research reports

- F-1 MoU with the National Center for Computational Hydroscience and Engineering, the University of Mississippi, USA.
- F-2 MoU with the Universiti Teknologi MARA (UiTM), Malaysia
- F-3 MoU with the National Hydroelectric Power Corporation LTD. (NHPC), India
- F-4 MoU with the International Centre for Water Hazard and Risk Management (ICHARM), Japan
- F-5 Agreements with the Elsevier

APPENDIX 3 Thematic Analysis of IRTCES Activities

Staff and Organizational Chart

The organizational chart of IRTCES² is shown below. IRTCES is administered by a Board of Directors appointed by the Ministry of Water Resources, P.R. of China. The Secretary General of IRTCES presides over the daily administration and operation. The Advisory Council gives advice and suggestions on the programming of activities of IRTCES to assist in mobilizing financial resources for the Center's activities. The Advisory Council is composed of one representative of the Government of China, one representative of the Director General of the UNESCO, six members elected by the IHP Intergovernmental Council and five members selected by the Government of China. The members should include representatives from other United Nations organizations concerned by sediment problems, representatives of relevant international organizations, and eminent scientists in the field of erosion and sedimentation studies



IRTCES serves as Permanent Secretariat for International Symposium on River Sedimentation (a triennial international conference) and Chien Ning Memorial Foundation for Erosion and Sedimentation, which awards the “Chien Ning Prize for Erosion and Sedimentation Studies” since 2004. These are directly managed by the Secretary General. Office of the Secretary, Department of International Exchange and Information, which houses also the Secretariat for WASER (the World Association for Sedimentation and Erosion Research), and the Department of Research and Training work under the direction of the Secretary General. The Secretary General also presides over the research and training centers JES

² Brochure of IRTCES (the latest version, 2009)

(Jingjiang Experimental Station), HBEC (Hangzhou Base for Estuarine and Coastal Research), and the China National Information Network of Erosion and Sedimentation (NINES), and Pearl River Base for Scientific Research (PRBS).

The list of IRTCES key staff members composed of full time staff and invited part time stag/experts is provided in APPENDIX 4 together with their position. At the time of the assessment (September 2011), IRTCES had 18 full time staff members and 10 Invited part time staff and experts. The table and the graphic presented in APPENDIX 4 show that the number of staff members remained stable over the last six years.

Facilities

The office building of IRTCES has a floor area of 4,300m². It includes offices for the scientific administrative personnel, guesthouse (20 rooms), meeting rooms and a conference hall equipped with advanced conference services, modern audio and video facilities, and a computer projection system.

IRTCES also enjoys three bases outside of Beijing for experimental studies, training activities and international cooperative projects. These are:

- Jinjiang Experimental Base (since 1996),
- Hangzhou Experimental base for Estuarine and Coastal research (since 1999), and
- Pearl River Base for Scientific research (since 2005).

Budget (see APPENDIX 5)

The Chinese Government has supported IRTCES since its establishment in 1984. The total budget of IRTCES is composed of the budget provided by the Chinese Government and the extra budget brought in by IRTCES scientists by means of funded projects. A summary of IRTCES budget is provided in APPENDIX 5.

Over the last six years, the total budget of IRTCES varied between 2.9 and 3.8 million RMB, with an average of 3.45 million RMB. The official budget provided by the Government of China varied between 1.1 and 1.4 million RMB, with an average of 1.22 million RMB. On the average the official budget accounts for 35.2% of the total budget. The remaining 64.8% of the budget is provided by the funded projects brought in by IRTCES scientists. It is clear that without this “extra budget” the functioning of IRTCES will not be sustainable.

Research Projects (see APPENDIX 6)

The income from funded projects constitutes, on the average, 65% of the total budget and is extremely important for the sustainability of the services provided by IRTCES. During the last six years, the staff of IRTCES was able to obtain 60 research funded research projects (APPENDIX 6) reaching a total of in 2.24 million RMB, which is roughly two times the budget received from the Government of China. The duration of these research projects varies between 1 year and 5 years. Out of these 60 projects, 42 projects have already been completed. A total of 18 projects are currently under way at the time of

assessment. Five projects are scheduled to be completed in this year. Others are scheduled to continue until 2012 and 2013.

The diversity of the topics covered by these projects shows the large scope of expertise of IRTCES staff. The projects concern physical ecological modeling of rivers, sediment transport in rivers and its modeling, warping dams and their impact, runoff and sediment load, optimal management of sediment, irrigation and irrigation management, soil and water conservation, habitat and ecological impact of hydraulic engineering, debris flows, integrated river management, effect of vegetation on erosion reduction, ecological protection and construction methods, impact of sediment transport on structures and its modeling, hydraulic structures, water intakes, watershed modeling, erosion control and sediment reduction, water transfer between catchments and regions, groundwater monitoring and modeling, climate change and its effects on rivers, pipelines, etc.

The funding for the projects comes from

- various governmental organizations in China, such as Ministry of Water Resources, Ministry of Science and Technology, Ministry of Finance, State Key Laboratory of Hydro-science and Engineering, National Natural Science Foundation of China, China Institute of Water Resource and Hydropower Research, Chinese Society of Water and Soil Conservation,
- governmental organizations in other countries and regions, such as Hong Kong Research Grant Council and National Natural Science, Dutch Ministry of Construction,
- various foundations, such as International Water Management Institute (IWMI), MDG (Millennium Development Goals) fund, Foundation of China,
- international organizations, such as UNESCO-IHP-ISI, FAO, and
- development banks, such as the Asian Development Bank (ADB).

Some of the projects listed in APPENDIX 6 are also internally funded by IRTCES. All the research projects are in full alignment with the strategic objectives of UNESCO-IHP, phases VI and VII.

Organization of International Conferences, Symposia and Seminars (see APPENDIX 7)

During the last six years considered in this assessment, IRTCES sponsored 6 conferences, organized 11 seminars and meetings, and co-sponsored 7 other conferences. The list of the conferences, symposia and seminars sponsored or co-sponsored by IRTCES are given in APPENDIX 7.

IRTCES has been serving as permanent Secretariat of the International Symposium on River Sedimentation (ISRS), which is being organized triennially since 1980. Since the 9th edition held in Yichang, China, the ISRS has become the official symposium of WASER. The ISRS symposium series has now become one of the most important conferences on river sedimentation and, at each edition, continues to attract a large number of specialists from all over the world. More than 2,500 scientists and engineers have so far participated in eleven editions of the ISRS, which were held four times in China (twice in Beijing, Nanjing and Yichang), and once in each one of the following countries: Jackson, Mississippi, USA, Karlsruhe, Germany, New Delhi, India, Hong Kong, Cairo, Egypt, Moscow, Russia, and Stellenbosch, South Africa.

During the assessment period two ISRS symposia were organized:

- The 11th International Symposium on River Sedimentation, was held at the University of Stellenbosch (near Cape Town), South Africa, on Sep. 6 – 9, 2010. More than 160 registered participants from over 30 countries participated in the symposium
- The 10th International Symposium on River Sedimentation was held in the M.V. Lomonosov Moscow State University, Moscow, Russia on August 1 to 4, 2007. A total of 237 participants from 30 countries and regions participated in the symposium.

The conferences, seminars, and meetings sponsored or co-sponsored by IRTCES provide an important platform that brings experts in erosion and sedimentation research and applications from all over the world for showcasing their latest research findings, application projects, to exchange ideas and shape the future of erosion and sedimentation research.

Teaching and Training (see APPENDIX 8)

IRTCES has conducted a number of training courses in partnership with UNESCO ISI, Ministry of Water Resources, P.R. China, and other partners. A list of training courses and workshops for the last six years is given in APPENDIX 8. These workshops and training course are intended to meet the objective of UNESCO-IHP-ISI regarding “Education and Capacity building for Sustainable Sediment management”.

These workshops and training courses are designed to respond to the needs of a broad spectrum of professionals from a large number of countries and adapted to the level of the participants. The list of participants includes engineers, scientists from different disciplines, managers, stakeholders and decision-makers from various countries. During the workshop, generally, the participants are introduced to the state of the art knowledge and applications of the topic through a series of lectures, discussions. The lectures are given by renowned professors and researchers from China and, sometimes, also from abroad.

The knowledge acquired during the lectures and discussions is strengthened during a one-day field study. The course also provides a platform for the participants from different countries and different scientific backgrounds to come together and exchange ideas. The students give seminars to present their work and share their knowledge of problems with fellow participants and experts and receive feedback from them. Social events organized during the course allow the participants from different countries to establish strong bonds and stimulate international collaboration and understanding.

- The “ISI International Advanced Training Workshop on Water and Soil Conservation” took place in Beijing on September 12-20, 2011, with **30 participants** from **11 countries**. The workshop was the major activity of the International Sediment Initiative (ISI) of UNESCO for 2010-2011.
- The “International Advanced Training Workshop on Integrated River Basin Management” took place in Beijing on July 27 to August 3, 2009, with **51 participants** from **18 countries**. The workshop was the major activity of the International Sediment Initiative (ISI) of UNESCO for 2008-2009. The workshop also was one of the activities for the Silver Jubilee of IRTCES. The workshop focused on (1) Theory of integrated river basin management; (2) Principles of water resources management; (3) Measures of water and soil conservation; (4) Basic knowledge of river ecology and methods restoration; (4) Experiences on developing and applying technologies for integrated river basin management; and (5) Information exchange in the related fields. In addition to lectures, the course includes an introduction to the South-to-North Water Diversion Project in China as a case study. The theoretical approach is strengthened by a visit to the

Laboratory of IWHR(China Institute of Water Resources and Hydropower Research) and a field trip to demonstrate the small watershed management in Suburb of Beijing. Seminars given by participants promote exchange.

- The training Workshop on River Management and Flood Control took place in Yichang, China, on Sep. 21-29, 2008, with over **71 participants from China**.
- The “Advanced Training Workshop on Reservoir Sedimentation Management” took place in Beijing on October 10-16, 2007 with **29 participants from 12 countries**. The workshop was the major activity of the International Sediment Initiative (ISI) of UNESCO for 2006-2007. In China, a number of reservoirs constructed on heavily sediment-laden rivers and the reservoir sedimentation problems are extremely important. Chinese scientists and engineers involved in sediment research have accumulated rich experiences and developed effective methods for dealing with the problems of reservoir sedimentation management. The course was designed to share this knowledge and methods with scientists, engineers, managers and decision makers from other countries facing similar issues.

In 2006, on request by the UNESCO Office in Beijing, IRTCES dispatched Mr. An Bo from the IWHR to DPRK, a specialist working in the field of flood forecasting and flood prevention, to deliver a lecture for a training course held in Pyonyang on June 13-17, 2006, organized within the framework of UNESCO’s Water Sciences activities, which was hosted by the State Hydro- Meteorological Administration (SHMA). This training course was attended by more than 20 participants from Hydrology Research Institute and several hydrology stations under State Hydro-meteorological Administration (SHMA), Kim Il Song University, HamHung Hydraulic Power University and Hydro-meteorological College of DPRK.

The courses organized by IRTCES in collaboration with UNESCO helped to train close to 300 participants from more than 30 countries around the world. The incomplete list includes Afghanistan, Australia, Bangladesh, China, Congo, DPRK, Hungary, India, Indonesia, Iran, Kyrgyz, Lesotho, Mongolia, Myanmar, Nepal, Nigeria, Pakistan, Romania, Sri Lanka, Sudan, Turkey, Uganda, Uzbekistan, and Zimbabwe. Many of these countries are developing countries faced with serious erosion and sedimentation problems with significant impact on economic and social development. The training courses organized by IRTCES constitute an important platform for ensuring capacity building and help to educate experts that can tackle the problems of erosion and sedimentation in their respective countries.

On September 17, 2011, Prof. Altinakar, one of the two evaluators, gave a lecture, on the topic “Mechanics of Turbidity Currents and Reservoir sedimentation”, within the framework of the International Advanced Training Workshop on Water and Soil Conservation, which was being held at IRTCES during September 12-19, 2011. Thus, he had the opportunity to directly interact with the participants and discuss their experiences about the training course. All participants who interacted with Dr. Altinakar expressed a high degree of satisfaction with regard to the course content, facilities, course notes, the lectures and the lecturers.

Teaching and training activities contribute to the UNESCO-IHP-VI and VII goal of “Water education for sustainable development” and “enhancing governance in water resources management to achieve ecosystem sustainability”.

Publications by IRTCES and Dissemination of Scientific Knowledge (see APPENDIX 9 and APPENDIX 10)

During the last six years, IRTCES staff has published 25 Research reports, of which seven are UNESCO-IHP Research Reports. The list of research reports is provided in APPENDIX 9. The research reports cover various aspects of erosion and sediment deposition processes in river basins including their morphodynamic, environmental, ecological impact, water and soil conservation practices, effect of global climate change, irrigation management, water intake design, water transfer projects, reservoir sedimentation, flood related problems and sediment management, etc.

A list of various other documents published by IRTCES is given in APPENDIX 10. These include periodically published journals and newsletters, lecture notes of the training courses, proceedings of the conferences sponsored or co-sponsored by IRTCES, and the field data collected during various campaigns.

IRTCES publishes the International Journal of Sediment Research (IJSR) quarterly. The IJSR has now become an extremely important media for researchers around the world to communicate the results of their research not only in the mechanics of sediment transport and fluvial processes, but also in geography, geomorphology, soil erosion, sediment yield, soil conservation, environmental and ecological impact of sedimentation, social and economic aspects of sedimentation and its assessment, etc. The journal has currently an impact factor of 1.708 and welcomes also papers related to engineering aspects of erosion and sedimentation.

Other periodic publications are “China Gazette of River Sedimentation”, which is published annually and contains data from 11 rivers in China, and “UNESCO-ISI Newsletters”, which is published quarterly. Both are available online.

The lecture notes of the training courses are published in paper form and distributed to students. The PDF versions of these lecture notes are available online at IRTCES website.

Scientific Publications of IRTCES Staff (see APPENDIX 9, APPENDIX 11)

IRTCES Staff members have been very productive in publishing and disseminating the results of their research in numerous scientific journals and conferences. A list of journal and conference papers published by IRTCES staff is provided in APPENDIX 11. The table below summarizes the number of papers published by IRTCES members during the last six years considered for the present assessment. Journal papers in Chinese and English are given separately.

Year	Journal Papers in Chinese	Journal Papers in English	Conference Papers in English	Papers for International and Regional Conferences	Research Reports
2006	25	4		4	5
2007	34	9	3	11	5
2008	38	16	3	12	3

2009	18	18	2	8	5
2010	25	13		15	3
2011	4	4		4	4
Total	144	64	8	54	25

The total number of published journal papers in both Chinese and English is 208. In addition, a total 62 conference papers have been presented in various international and regional conference and published in their proceedings. IRTCES staff has also communicated the results of their funded research in 25 research reports.

Considering the relatively small number of staff listed in APPENDIX 4, this is impressive by any standard. The published journal papers appeared in a large number of scientific publications published in China and abroad. The list given below summarizes the names of the journals in three categories:

Chinese:

1. Academic Degrees & Graduate Education
2. Acta Botanica Boreali-Occidentalia Sinica
3. Acta Ecologica Sinica
4. Advance in hydraulics and hydroinformatics in China
5. Advances in Earth Science
6. Advances in Science and Technology of Water Resources
7. Advances in Water Science
8. Agricultural Research in the Arid Areas
9. China Three Gorges Construction
10. China Water Resources
11. Chinese Agricultural Science Bulletin
12. Chinese Forestry Science and Technology
13. Chinese Journal of Applied Ecology
14. CHINESE JOURNAL OF ECO-AGRICULTURE
15. Ecology and Environment
16. Forest Research
17. Frontiers of Environmental Science and Engineering in China
18. Geographical Research
19. Hydro-Science and Engineering
20. Journal of Anhui Agri. Sci.
21. Journal of Beijing Forestry University
22. Journal of Catastrophology
23. Journal of China Institute of Water Resources and Hydropower Research
24. Journal of Chinese Agricultural Engineering
25. Journal of Hydraulic Engineering
26. Journal of Hydrodynamics
27. Journal of Hydrodynamics(Ser.A)
28. Journal of Hydroelectric Engineering
29. Journal of Irrigation and Drainage
30. Journal of Kunming University of Science and Technology(Science and Technology)
31. Journal of Nanjing Forestry University
32. Journal of Northwest Forestry University
33. Journal of Sediment Research

34. Journal of Southwest Forestry University
35. Journal of Tianjin University
36. Journal of Tsinghua University (Science and Technology)
37. Journal of Water Resources and Hydropower Engineering
38. Journal of Xi'an University of Technology
39. Journal of Yellow River
40. Origin and Challenge, Stockholm "Water Front"
41. Quaternary Sciences
42. Resources and Environment in the Yangtze Basin
43. Science of Soil and Water Conservation
44. Sciencepaper Online
45. Sediment Research
46. Seed
47. Shaanxi Forest Science and Technology
48. The Global Seabuckthorn Research and Development
49. Voice of IWHR
50. Water and Wastewater engineering
51. Water Resources
52. Water Resources and Hydropower Engineering
53. Water Resources Economics
54. Yangtze River
55. Yellow River

Chinese English Journals

1. Water Science and Engineering

International Scientific Journals

1. Annals of Warsaw University of Life Sciences, Land Reclamation
2. ASCE Journal of Hydraulic Engineering
3. Earth Surface Process and Landforms
4. Ecological Engineering
5. Ecological Modeling
6. Environmental Earth Science
7. Geomorphology
8. IAHR, Hydrolink
9. IAHR, International Journal of River Basin Management
10. IAHR, Journal of Hydraulic Research
11. International Journal of Hydro-Environment Research
12. International Journal of Sediment Research
13. Journal of Asian Earth Sciences
14. Journal of Environmental Informatics
15. Journal of Environmental Management
16. Journal of Hydrology
17. Journal of Mountain Science
18. Science of Soil and Water Conservation
19. Sedimentology
20. Water Resources Research
21. Water Science & Technology: Water Supply

The focus areas of journals cover a wide range of scientific disciplines. Journal papers in Chinese have appeared in 57 publications and journal papers in English appeared in 21 publications. In addition to main focus areas of IRTCES, which are hydraulics, hydrology, earth surface processes, water and soil conservation, sediment transport, sedimentology, numerical modeling, water resources, reservoir management, hydroelectric production, water supply and irrigation, environmental engineering. The publications cover various other scientific disciplines, such as environmental protection, ecology, ecological and ecosystem modeling, geomorphology, coastal processes, forestry, botany, geography, agriculture, engineering education, and natural hazards, etc. The large number of disciplines covered is a good indication of the outreach and influence of the research and training work done by IRTCES.

Chien Ning Prize and Chien Ning Memorial Foundation for Erosion and Sedimentation

IRTCES manages the Chien Ning Memorial Foundation for Erosion and Sedimentation, and awards the “Chien Ning Prize for Erosion and Sedimentation Studies” to outstanding sediment researchers and engineers. Since its establishment in 1987, nine award ceremonies have been held, and 35 Chinese Experts and 18 technical papers have received awards. The International Qian Ning Prize for Erosion and Sedimentation Technology was established in 2007. Since then, award ceremonies have been held in Moscow, Russia, and Stellenbosch, South Africa, and 4 famous scientists outside of China have been awarded. This activity is relevant to the activity of “promoting leading edge research that provides policy-relevant advice to Member States” under IHP-VI.

Database Construction and Maintenance

IRTCES has built and maintains a series of extremely important databases in the domain of erosion and sedimentation research and practice. The recently completed database “Global data on Erosion and Sedimentation”(http://data.irtces.org/) is a rich source of information and data:

- runoff and sediment load data from 85 hydrological stations on 48 rivers in China,
- runoff and sediment load data from 166 hydrological stations on rivers outside of China, and
- a large collection of sediment related documents, technical papers, pictures and media sources.

IRTCES website serves also as a global sediment portal providing links to data sources maintained by various organizations such as ICOLD, GEMS/Water, USGS, EOLSS, ICID, SedNet, publications, etc. (for example Sedimentation Databases of the Rivers in USA). This activity falls under the various themes and activities of IHP-VI and VII.

Regional and International Collaboration (See APPENDIX 13 and APPENDIX 14)

IRTCES has a number of agreements for cooperation and exchange with various organizations in different countries including Yugoslavia, Pakistan, Sudan, Iran, the United States, India and Malaysia, etc.

IRTCES maintains close relationship with a large number of professional associations, research centers and government agencies around the world.

IRTCES has cooperative agreements with various research institutes in China, such as the Chinese Academy of Sciences, Nanjing Hydraulic Research Institute and the Yellow River Institute of Hydraulic Research, etc., as well as with various renowned Chinese higher education institutions, such as Tsinghua University, Wuhan University and Hohai University. IRTCES exchanges information, documents and books with about 60 institutions in China and 84 other institutions in 48 countries and regions around the world.

Currently, IRTCES enjoys partnerships with many institutions abroad and participates in cooperative networks at local, regional, national and international levels. Public and private sector entities working on erosion and sedimentation are invited to join the network of partners, which include:

- UNESCO
- Farmer-centered Agricultural Resources Management Programme (UNDP/FAO/UNIDO)
- Participatory Watershed Management Training in Asia Program, Food and Agriculture Organization (FAO)
- World Association for Sedimentation and Erosion Research (WASER)
- International Association of Hydraulic Engineering and Research (IAHR)
- World Association of Soil and Water Conservation (WASWC)
- Pakistan Council of Research in Water Resources (PCRWR), Pakistan
- National Hydroelectric Power Corporation Ltd. (NHPC), India
- University of Technology MARA (UiTM), Malaysia
- Royal Forest Department, Thailand
- Environmental and Water Research Center, Iran
- National Center for Computational Hydroscience and Engineering, University of Mississippi (NCCHE), United States
- Universities in the PRC, Italy, Japan, Russia, South Africa, and the United Kingdom
- Network of Asian River Basin Organizations (NARBO)
- APWF's Network of Regional Water Knowledge Hubs (APWF-Knowledge Hubs)
- Various Chinese research institutes: China Institute of Water Resources and Hydropower Research, Nanjing Hydraulic
- Research Institute, Changjiang River Scientific Research Institute, Yellow River Institute of Hydraulic Research and
- Pearl River Hydraulic Research Institute

APPENDIX 13 provides the list of international scholars and delegations that visited IRTCES during the last six years to establish contact, to discuss and explore collaborative research and activities, review international program conducted by IRTCES, plan for international conferences, symposia, and meetings sponsored or co-sponsored by IRTCES, and to attend conferences and meetings organized by IRTCES, to participate as lecturer in the training courses, to sign agreements, and to discuss administrative issues, etc.

APPENDIX 14 provides the list of the 52 overseas business trips made by IRTCES staff to participate and give presentations in technical and administrative conferences, meetings; to give lectures on erosion and sediment related topics; to discuss the organization of the sponsored and co-sponsored

conferences; to sign cooperative agreements, etc. Some of these visits were funded by UNESCO and IRTCES; others were financed by the local organizing committees and host countries.

IRTCES Serving as the Secretariat of WASER

IRTCES serves as the Secretariat of WASER (the World Association for Sedimentation and Erosion Research), which was founded in 2004 to promote the study and development of the science of erosion and sedimentation interpreted in its widest sense, and to foster the application and dissemination of knowledge of sedimentation and erosion. IRTCES and WASER activities are complementary and together contribute to the IHP-VI and VII themes and activities.

APPENDIX 4 IRTCES Staff

Full time staff

1. Prof. Dr. Kuang Shangfu, Director
2. Prof. Dr. Hu Chunhong, Deputy Director and Secretary-General
3. Prof. Dr. Gao Zhanyi, Deputy Director
4. Prof. Ning Duihu, Deputy Director
5. Prof. Lin Bingnan, Academician of CAS

Division of Secretary

6. Prof. Chen Jianguo, Division Chief
7. Prof. Fan Zhao, Vice Secretary-General
8. Mr. Fu Hongxing, engineer, manager of IRTCES Hotel
9. Mr. Mu Guiting, support staff

Division of Research and Training

10. Prof. Dr. Wang Yangui, Division Chief
11. Prof. Dr. Liu Cheng, Deputy Division Chief
12. Prof. Zhang Yanjing, researcher
13. Ms. Shi Hongling, senior engineer, researcher

Division of Information and International Cooperation

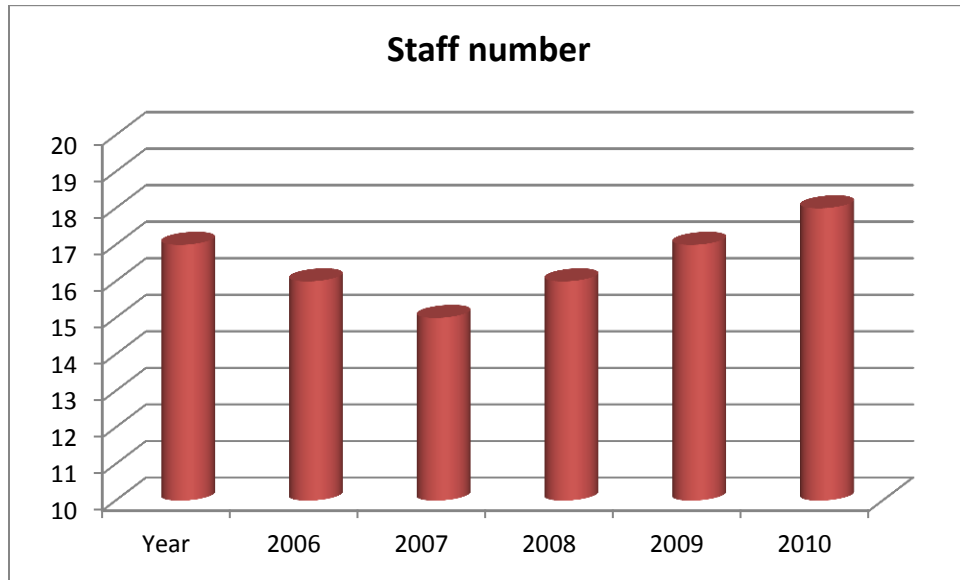
14. Prof. Dr. Liu Guangquan, Division Chief
15. Prof. Dr. Liu Xiaoying, researcher
16. Prof. Dr. Chen Yuehong, assistant of IJSR Chief Editor
17. Mr. Gan Ping, engineer, support staff
18. Mr. Du Pengfei, engineer, researcher

Invited part time staff/Experts

1. Prof. Dr. Wang Zhaoyin, Chairman of Advisory Council, IJSR Chief Editor
2. Ms. Tong Yuling, expert
3. Ms. Shen Xiaojing, support staff
4. Prof. Dai Dingzhong, expert
5. Prof. Tan Ying, expert
6. Prof. Zheng Rugang
7. Prof. Zhou Zhide, expert
8. Prof. Xu Mingquan, expert
9. Prof. Wu Deyi, expert
10. Prof. Ding Lianzhen

Changes of full time staff number

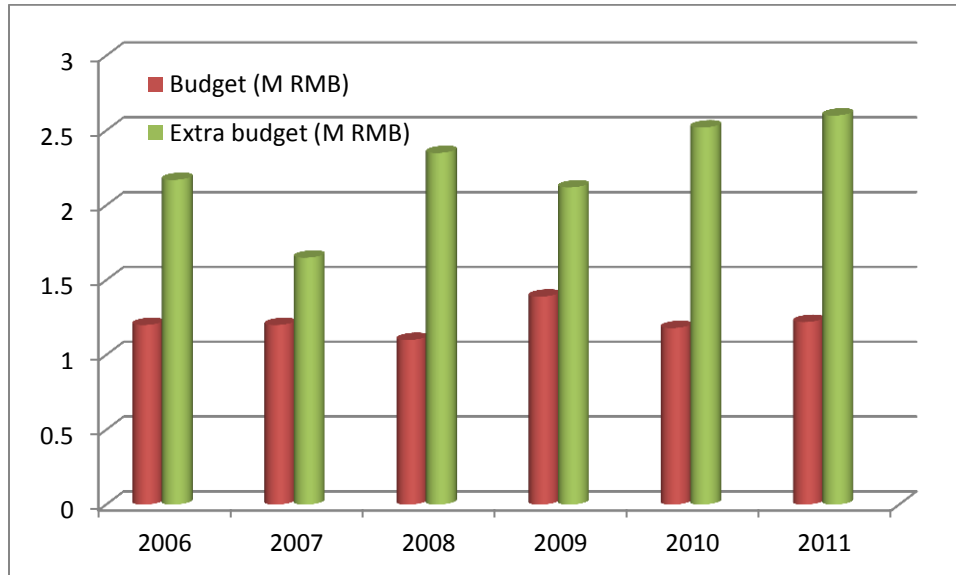
Year	2006	2007	2008	2009	2010	2011
Staff number	17	16	15	16	17	18



APPENDIX 5 IRTCES Budget

Variation of IRTCES Budget

Year	2006	2007	2008	2009	2010	2011	6-year average
Budget Million RMB (% of Total Budget)	1.2 (35.6%)	1.2 (42.1%)	1.1 (31.9%)	1.39 (39.6%)	1.18 (31.9%)	1.22 (31.9%)	1.22 (35.2%)
Extra budget Million RMB (% of Total Budget)	2.17 (64.4%)	1.65 (57.9%)	2.35 (68.1%)	2.12 (60.4%)	2.52 (68.1%)	2.6 (68.1%)	2.24 (64.8%)
Total Budget Million RMB	3.37	2.85	3.45	3.51	3.7	3.82	3.45



APPENDIX 6 List of Completed and Ongoing Research Projects

No	Contractor / Team leader	Project Title	Funding resources	Cost (million Yuan)	Duration	Note
1.	IRTCES	Integrated Physical and Ecological Management of Rivers (Case Study)	UNESCO-IHP-ISI MWR IRTCES	USD 24600	2006-2007	
2.		Case Study on Sediment Management and Wetland Conservation at Yellow River Mouth	UNESCO-IHP-ISI MWR IRTCES	USD 17300	2006-2007	
3.		Changes in water and sediment loads of rivers in China - Contribution to the World Water Development Report 3	IRTCES			
4.		Warping dam and its effects on environment, economy and society in loess plateau region of China - Contribution to the World Water Development Report 3	IRTCES		2007	
5.		Pilot case study on "Variation in Runoff and Sediment Load in the Pearl River Basin and Its Cause"	UNESCO-IHP-ISI MWR IRTCES	USD 18000	2008-2009	
6.		Pilot case study on "Utilization of Sediment Resource in the Lower Yellow River"	UNESCO-IHP-ISI MWR IRTCES	USD 25000	2009-2010	
7.	Hu Chunhong	Database Construction of Global Information System on River Sedimentation	Ministry of Finance	9.00	2006-2009	
8.	Gao Zhanyi	Pilot on Using Solar Photovoltaic (PV)-Driven Irrigation in pasture area in Qinghai Province, China,	ADB	0.50	2009-2010	

9.	Gao Zhanyi	Modification and application of FAO Modernizing irrigation management – MASSCOTE approach in China,	FAO	0.35	2008-2009	
10.	Gao Zhanyi	Reform and Effect of Water Price in China, funded by International Water Management Institute,	IWMI	0.60	2006	
11.	Gao Zhanyi	Comprehensive Research on the Key Technologies for Modernization and Water Saving in Large Irrigation Schemes in China	Ministry of Science and Technology	32.00	2008-2011	
12.	Gao Zhanyi	Assessment Procedure for the Performance and Statue of Large Irrigation Schemes in China,	Ministry of Science and Technology	2.90	2006-2011	
13.	Ning Duihu	An investigation on current situation of implementation of soil and water conservation administrative license	Chinese Society of Water and Soil Conservation	0.20	2010	
14.	Wang Zhaoyin	Habitat moderation of biological species in the middle of the West River	Enterprises and institutions entrusted	0.20	2009-2010	
15.	Wang Zhaoyin	Relationship between benthonic animal and composition of riverbed and its application in the ecological evaluation of hydraulic engineering	National Natural Science Foundation of China	0.37	2008-2010	
16.	Wang Zhaoyin	Management and mitigation of chain disasters of mass movements and debris flows induced by the Wenchuan Earthquake	973 program of the Ministry of Science and Technology	3.60	2008-2010	
17.	Wang Zhaoyin	Predictive modelling of sediment transport and morphology in the Lower Yellow River	Ministry of Science and Technology of China and Dutch Ministry of Construction	2.00	2004-2007	

18.	Wang Zhaoyin	Integrated Physical and Ecological Management of Rivers – with Particular Reference to the East River	Hong Kong Research Grant Council and National Natural Science Foundation of China	0.37 RMB+ 0.75 HK dollar	2004-2006	
19.	Wang Zhaoyin	Ecological study and optimization of operation scheme of hydro-projects on the Yangtze River	973 program of the Ministry of Science and Technology	4.15	2003-2008	
20.	Wang Zhaoyin	Effect of bed structure on the rate of bed load transportation in mountain streams and application of artificial bed structure to control a mountain stream	State Key Laboratory of Hydro-science and Engineering	0.50	2009-2010	
21.	Wang Zhaoyin	Vegetation-erosion dynamics and its application	National Natural Science Foundation of China	0.30	2003-2006	
22.	Liu Guangquan	Study on controlling mode of ecological construction and it's demonstration in the overlapping area of the water and wind erosion	Ministry of Science and Technology	2.40	2006-2010	
23.	Liu Guangquan	Study on vegetation restoration and afforestation technology in the serious erosion region of the northwest ecotone	Ministry of Science and Technology	1.00	2006-2010	
24.	Chen Jianguo	Numerical Modeling Study of Sediment for the Phase I of Liaoning Hongyanhe Nuclear Power Plant			2006-2007	
25.	Chen Jianguo	Experimental Research on the Sediment Physical Model of Water Intake Engineering for the Phase I of Liaoning Hongyanhe Nuclear Power Plant		1.50	2006-2007	

26.	Chen Jianguo	Experimental Research on Sediment Physical Model of Intake Tunnel for the Phase I of Liaoning Hongyanhe Nuclear Power Plant			2006 - 2007	
27.	Chen Jianguo	Research on Optimal Spatial Allocation of Sediment in Main Channel of Yellow River		0.70	2006 - 2008	
28.	Chen Jianguo	Health Mechanism and controlling measures of Sediment-laden River		0.60	2007 - 2009	
29.	Chen Jianguo	Research on Flood Embank with Simulation Test for Gangue Power Plant of Yangquan City NaZhuang Coal Group CO.,LTD		0.55	2007	
30.	Chen Jianguo	Research on Regulation and Control of Large-scale Hydropower Project and Responses of Downstream River		0.40	2007 - 2008	
31.	Chen Jianguo	Research on Evolution of the Water Intake-outlet Sea Area at Yang River Nuclear Power Station		1.00	2007 ~2008	
32.	Chen Jianguo	Project Proposal on Water Requirement for Sediment Transport at Ning-Mong Section of the Yellow River for the Phase I of West Route of South-to-North Water Transfer Project		0.90	2008 ~2009	
33.	Chen Jianguo	Research on Evolution of the Water Intake-outlet Sea Area at Huaneng Shandong Shidao Bay Nuclear Power Station		0.90	2008	
34.	Chen Jianguo	Optimal Deployment of Runoff and Sediment Load Resource in Rivers and Controlling Measures of Sustaining Health of Rivers		0.45	2008 ~2011	

35.	Chen Jianguo	Simulation and Adjustment of Watershed Hydrologic Cycle		0.50	2008 ~2010	
36.	Chen Jianguo	Research on Mathematical Modeling of Flow and Sediment for Tunnel Outlet of Dahuofang Water Transfer Project		36.5	2009 ~2010	
37.	Chen Jianguo	Research on Ecological Carrying Capacity of Water Resources in Yellow River Delta		0.90	2008 ~2009	
38.	Chen Jianguo	Analysis on Sedimentation Reduction at Xiaobeiganliu and the Lower Yellow River in Different Operation Modes for Regulation and Control System of Runoff and Sediment of the Yellow River		0.70	2010	
39.	Liu Cheng	Study on Estuarine Sediment Oxygen Demand and its Impact Factors	NSFC	0.23	2004-2006	
40.	Yu Qiyang, Liu Xiaoying	Evaluation System and Indicators of Impact of Reservoir Function	Ministry of Water Resources	0.80	2008-2010	
41.	Yu Qiyang, Liu Xiaoying	Cutting-edge Research and Technology on Erosion and Sedimentation in Typical Countries	China Institute of Water Resource and Hydropower Research	0.10	2009-2010	
42.	Yu Qiyang, Liu Xiaoying	Research on Regulation of Eco-hydrological Measures in the Arid Valley of Water Transfer Area of South to North Water Transfer Project	Ministry of Science and Technology	0.10	2008-2010	
43.	Liu Xiaoying	Research on Common Technologies of Rural Water Resource Protection	Ministry of Water Resources	0.30	2010	

44.	Gao Zhanyi	Managing Climate Change Effect on Groundwater through Monitoring and Modelling Groundwater	MDG fund	6.50	2008-2011	On going
45.	Gao Zhanyi	Multiple Use Services (MUS) system in China,	FAO	0.21	2010-2011	On going
46.	Gao Zhanyi	Demonstration on Application of Low Pressure Pipeline Technologies in Yumenkou Irrigation Scheme in Shanxi Province China	Ministry of Water Resources, China	2.90	2010-2012	On going
47.	Gao Zhanyi	Extension project on Using Solar Photovoltaic (PV)-Driven Irrigation in major pasture area in China	Ministry of Water Resources	1.50	2011-2012	On going
48.	Ning Duihu	Research for common technology of soil and water loss calculation in production and construction projects	Ministry of Water Resources	3.19	2010-2011	On going
49.	Ning Duihu	Soil and water conservation in China: development course and future policy	Development and research center of ministry of water resources of P.R. China	0.90	2011-2012	On going
50.	Ning Duihu	Compiling non-engineering measures in national soil and water conservation planning	Development and research center of ministry of water resources of P.R. China	0.20	2010-2011	On going
51.	Wang Zhaoyin	Knickpoints on the Yalutsangpo River and Ecology	National Natural Science Foundation of China	0.50	2010-2012	On going
52.	Wang Zhaoyin	Stream networks and ecological management of the Sanjiangyuan Region	Ministry of Science and Technology	2.30	2011-2013	National Research Project

53.	Wang Zhaoyin	Control strategy of golden mussel (<i>Limnoperna fortunei</i>) invasion into water transfer tunnels	Ministry of Water Resources Research Project	3.22	2009-2012	National Common weal Research Program
54.	Wang Zhaoyin	Forming mechanism and modeling of mountain flood disasters under extreme conditions	National Natural Science Foundation of China	1.40	2009-2012	Excellent state key laboratory research project fund
55.	Wang Zhaoyin	Study on channel change and ecological security of the Yarlung Zangbo River	The local government of science and technology plan fund projects	0.40	2010-2013	
56.	Chen Jianguo	Research on Perched Sediment of Local Reach and the Key Technologies of Hump Reach of the Lower Yellow River	Ministry of water..	2.32	2009~2012	On going
57.	Chen Jianguo	Evolution of Storm Flooding in a Small Watershed of Mountainous Areas and Formation Mechanism of Mountain Torrents	Ministry of Science	0.50	2011~2012	On going
58.	Liu Xiaoying	Research on Common Technologies of Rural Water Resource Protection	Ministry of Water Resources	0.40	2011	On going
59.	Zhang Yanjing	Variation of water and sediment and response to salt water intrusion in the Pear River Mouth	Ministry of Water Resources	1.62	2009-2012	On going
60.	Shi Hongling	Study on Diversion Water Demand for the Yellow River Irrigation Districts.	Ministry of Water Resources	1.07	2009-2012	On going

APPENDIX 7 List of International Conferences, Symposia and Seminars

IRTCES Sponsored Conferences

1. 11th International Symposium on River Sedimentation, Stellenbosch, South Africa on Sep. 6 – 9, 2010. Five Keynote presentations and over 120 technical presentations from 30 countries or regions
2. 10th International Symposium on River Sedimentation, Aug. 1-4, 2007, Moscow, Russia, 300 participants
3. 3rd International Conference on Estuaries & Coasts, Sendai, Japan , Sept. 14-16, 2009. Over 100 participants from over 20 countries and regions
4. Third Sino-American Workshop on Advanced Computational Modeling in Hydroscience and Engineering, in May 2008, USA, 50 participants
5. Second Sino-American Workshop on Advanced Computational Modeling in Hydroscience and Engineering, in Nov. 2006, 80 participants
6. 2nd International Conference on Estuaries and Coasts (ICEC-2006), Nov. 28-30, 2006, Guangzhou, China. 120 participants

IRTCES Organized Seminar, meetings

1. The 10th Anniversary Celebration of Issuing China Gazette of River Sedimentation and Seminar on Sediment Problems in China Dec. 29, 2010. Over 100 participants Nine keynote lectures presented
2. The 3rd WASER Council Meeting and General Assembly Sep.5, 7, 2010
3. IRTCES Sponsoring Symposium on China Ecological Rehabilitation of Soil and Water Conservation
4. A Seminar on Global Climate Change and Water Resources in Beijing on April 17, 2009
5. IRTCES Silver Jubilee celebration July 28 2009, Beijing
6. Seminar on Integrated River Basin Management under Global Climate Change, Beijing, July 29, 2009, 4 Keynote lectures
7. 6th ISI Steering Committee member meeting case studies, ISI Information System, Climate change and ISI etc. were discussed. in Beijing on November 5 to 7, 2008
8. Workshop on Global Change Impacts and Role of ISI in Nov.2008
9. The first meeting of the 7th IRTCES Advisory Council , Beijing on November 6, 2008
10. The Second Council Meeting of WASER and the WASER Assembly , in Moscow July 31 and August 4, 2007
11. The meeting of core members of the UNESCO-IHP-ISI was held in Beijing on May 26, 2006

IRTCES Co-Sponsored Conferences

1. International Conference on Combating Land degradation in Agricultural Areas and the 1st Council Meeting of WASWAC (Xi'an, China, Oct. 12-14, 2010) about 300 participants from 36 countries
2. Workshop on 'Sediment Problems and Sediment Management in Asian River Basins', Hyderabad, India, September 7-8, 2009
3. High-level International Forum on Water Resources and Hydropower (Beijing, Oct. 16-18, 2008)
4. 7th National conference on basic sediment theory (Xian, 2008)
5. International Bedload Surrogates Workshop (April 11-14, 2007,USA)

APPENDIX 8 List of Training Courses by IRTCES

1. Training Course on Flood Forecasting and Preparedness, Pyongyang, DPRK (IRTCES Dispatching Lecturer for the Training Course, June 13-17, 2006)
2. International Advanced Training Workshop on Reservoir Sedimentation Management, Oct. 10-16, 2007, under the contract No. 861.360.7
29 participants from 12 countries
3. Advance Training Workshop on Hydroprojects and Eco-environment Construction, Oct. 21 – Nov. 2, 2007, Hangzhou
over 71 participants from China
4. Training Workshop on Reservoir Conservation
Sept. 20-28, 2008, Beijing
5. Training Workshop on River Management and Flood Control, Sep. 21-29, 2008, Yichang
over 71 participants from China
6. International Advanced Training Workshop on Integrated River Basin Management July 27 to August 3, 2009 Beijing
51 participants from 18 countries, 10 famous experts from China, Switzerland and Japan were invited to give lectures
7. International Advanced Training Workshop on Water and Soil Conservation
September 12-19, 2011 under the contract No. 861.360.1
30 participants from 11 countries

APPENDIX 9 List of Research Reports by IRTCES

UNESCO-IHP Research Reports

1. IRTCES, Case study on utilization of sediment resource in the lower Yellow River, 2010
2. IRTCES, Changes in runoff and sediment load in the Pearl River basin and its causes, 2009
3. IRTCES, Integrated Physical and Ecological Management of Rivers (Final Report), 2007
4. IRTCES, Warping dam and its effects on environment, economy and society in loess plateau region of China- Contribution to the World Water Development Report 3, 2007
5. IRTCES, Changes in water and sediment loads of rivers in China- Contribution to the World Water Development Report 3, 2007
6. IRTCES, Case study on sediment management and wetland conservation at Yellow River mouth, 2006
7. IRTCES, Integrated Physical and Ecological Management of Rivers (Phase I), 2006

Other Research Reports

1. Report on Comprehensive Research on the Key Technologies for Modernization and Water Saving in Large Irrigation Schemes in China, 2011
2. Assessment Procedure for the Performance and Statue of Large Irrigation Schemes in China, 2011
3. Report on Managing Climate Change Effect on Groundwater through Monitoring and Modelling Groundwater, 2011
4. Investigation report on current situation of implementation of soil and water conservation administrative license 2011.1
5. Report on Using Solar Photovoltaic (PV)-Driven Irrigation in pasture area in Qinghai Province, China, 2010
6. IRTCES, Final Report on Database Construction of Global Information System on River Sedimentation, 2010.6
7. Report on Modification and application of FAO Modernizing irrigation management – MASSCOTE approach in China, 2009
8. Report on the Physical Model of Evolution of the Water Intake-outlet Sea Area and Sediment movement at Yang River Nuclear Power Station, 2009.6

9. Report on the Mathematical Model of Evolution of the Water Intake-outlet Sea Area and Sediment movement at Yang River Nuclear Power Station, 2009.6
10. Liu Xiaoying Yu Qiyang, et al. Research Report on Cutting-edge of Research of Science and Technology on Erosion and Sedimentation in some Typical Countries, 2009.12
11. Report on the effect of Changjiang River-to-Weihe River Water Transfer Project on the Lower Report on Reform and Effect of Water Price in China, funded by International Water Management Institute, 2008
12. Report on schemes and evaluation of optimal spatial allocation of sediment in Yellow River, 2008.12
13. Report on Allocation modes and technology of optimal spatial allocation of sediment in Yellow River, 2008.12
14. Report on alteration of watercourse and improvement of the "secondary perched river" in the lower Yellow River, 2007.8
15. Report on Flood Embank with Simulation Test for Gangue Power Plant of Yangquan City NaZhuang Coal Group CO.,LTD, 2007.8
16. Weihe River and the scouring and silting in Sanmen Gorge Reservoir Area, 2006.1
17. Report on Response of the Channel to the Variation of Water and Sediment Processes in the Lower Yellow River, 2006.3
18. General Report on Water Intake-outlet of Taishan Power Plant Phase II Extension Project, 2006.12

APPENDIX 10 List of Publications by IRTCES

1. "International Journal of Sediment Research", Quarterly Journal in English version, 5 Volumes 21-26 from 2006 – 2011
2. "China Gazette of River Sedimentation (5 Volumes 2006-2010)" in Chinese version from 2006 – 2011
3. UNESCO-ISI Newsletters 21 issues (Quarterly newsletter) from 2006-2011
4. Summary of Hydrological and Sediment Transport Observations For the Cofferdam Impoundment Period of the Three Gorges Project (2003 - 2006), in July 2008
5. Summary of Field Data for Sedimentation in the Three Gorges Project (during the Initial Filling period 2006-2008) in July 2010
6. Proceedings of 2nd International Conference on Estuaries and Coasts (ICEC-2006), in Nov. 2006
7. Proceedings of Second Sino-American Workshop on Advanced Computational Modeling in Hydroscience and Engineering, in Nov. 2006
8. Proceedings of 2nd International Conference on Estuaries and Coasts (ICEC-2006), in Dec. 2006
9. Proceedings of 10th International Symposium on River Sedimentation, in August 2007
10. Proceedings of Third Sino-American Workshop on Advanced Computational Modeling in Hydroscience and Engineering, in May 2008
11. Proceedings of 3rd International Conference on Estuaries & Coasts, in September 2009
12. Proceedings of 11th International Symposium on River Sedimentation, in September 2010
13. Lecture Notes of Advanced Training Workshop on Reservoir Sedimentation Management, in October 2007
14. Lecture Notes of International Advanced Training Workshop on Integrated River Basin Management, in August 2009
15. Lecture Notes of International Advanced Training Workshop on Water and Soil Conservation, in September 2011

APPENDIX 11 List of Publications by IRTCES Staff

Journal Papers in Chinese

1. WANG Shuo,LIU Guang-quan,TU Xiao-ning. 2011. Photosynthetic Characteristics of *Armeniacasibirica* in the Crop-grazing Crisscross Ecotone on the Loess Plateau[J]. JOURNAL OF SOUTHWEST FORESTRY COLLEGE. 31(1): 22-26(in Chinese)
2. Liu, C., Hu, CH and Shi, HL, 2011, Changes of runoff and sediment fluxes of rivers in mainland of China discharged into Pacific. Sediment Research, No. 1, pp. 70-75 (in Chinese)
3. Liu, C., Hu, CH and Shi, HL, 2011, Changes of runoff and sediment fluxes of rivers in mainland of China discharged into Pacific. Sediment Research, No. 1, pp. 70-75(in Chinese with English abstract)
4. DENG An-jun,GUO Qing-chao,CHEN Jian-guo, 2011. Study of evolution of erosion and deposition in Xiaobeiganliu reach of Yellow River, Journal of Sediment Research, No.2 (in Chinese)
5. Gao Zhanyi, 2010: "The Development of Irrigation and Drainage and Technical Research and Extension in China", in: Journal of Water Resources and Hydropower Engineering", Vol. 41 No.12, (December, 2010): 8-14. (in Chinese)
6. Tian Shimin, Wang Zhaoyin, Xu Mengzhen, Zhang Kang, 2010, Study on Coupling Mechanism of Benthonic Animal and Area of Aquatic Habitat, Yellow River, 32(11), pp.19-20.(in Chinese)
7. Jia Yanhong, Wang Zhaoyin, Zhang Zhirong, Li Zhiwei, 2010, Soil erosion of cultivated lands in the Xihanshui River Basin, Journal of Tsinghua University(Science and Technology), 50 (9) : 1342-1345,1349. (EI) (in Chinese)
8. Xu Mengzhen, Wang Zhaoyin, Shi Wenjing, Wang Xuzhao, 2010, Mountain disaster chain induced by the Wenchuan earthquake in the Huoshiguo Gorge, Journal of Tsinghua University(Science and Technology), 50 (9) : 1338-1341. (in Chinese)
9. Wang Zhaoyin, Cui Peng, Liu Huaixiang, 2010, Management of quake lakes and triggered mass movements in Wenchuan earthquake, Journal of Hydraulic Engineering, 41 (7) , pp.1-7. (in Chinese)
10. Yu Guoan, Wang Zhaoyin, Huang Heqing, Liu Huaixiang, 2010, Geomorphology and Environment Effects of Landslide Dams (Dammed Lakes), Advances in Earth Science, 25(9) :934-940. (in Chinese)
11. Jiao Xing, Liu Guangquan, Kuang Shangfu. 2010.Review on application of Penman-Monteith Equation to studying forest vegetation evapotranspiration[J]. Journal of Hydraulic Engineering. 41(2): 245-252 (in Chinese)
12. Liu Guangquan, Kuang Shangfu, Tu Xiao. 2010. Water Resources Carrying Capacity for Vegetation Restoration of Eco-fragile Region in the Loess Plateau[J]. The Global Seabuckthorn Research and Development. 8(1):13-20(in Chinese)
13. Liu Guangquan, Kuang Shangfu, Tu Xiao. 2010. Simulating Potential Evapotranspiration and its Spatial and Temporal Changes of the Loess Plateau [J]. The Global Seabuckthorn Research and Development. 8(2):23-30 (in Chinese)

14. YAN Hui, LIU Guang-quan, LI Hong-sheng. 2010. Changes of root biomass, root surface area, and root length density in a *Populus cathayana* plantation[J]. *Journal of Applied Ecology*. 21(11): 2763-2768 (in Chinese)
15. DENG Lei, WANG Hongzhe, SHANGGUANG Zhouping, LIU Guangquan. 2010. Variations of specific leaf area and nutrients of Chinese caragana in the Loess Plateau region suffering both wind and water erosions[J]. *ACTA ECOLOGICA SINICA*. 30(18):4889-4897 (in Chinese)
16. ZHANG Jun-Feng, LI Qing-Mei, DUAN Xin-Fang, LIU Guang-Quan. 2010. Effect of chitosan on germination and enzyme activity of *Caragana korshinskii* Kom seed from different provenances[J]. *CHINESE JOURNAL OF ECO-AGRICULTURE*. 18(5):1026-1030 (in Chinese)
17. ZHANG Jun-feng, LI Qing-mei, DUAN Xin-fang, LIU Guang-quan. 2010. Effects of chitosan on seed germination and seedling growth of *Ziziphus acidojuba*[J]. *Journal of Beijing Forestry University*. 32(6):146-150 (in Chinese)
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APPENDIX 12 LIST OF MEDIA OUTREACH

	Date	Title		Source	Internet	Newspaper	TV/Radio
2005	Nov. 30	China strengthen cooperation with UNESCO on sediment problem	IRTCES	China News Service	√		
	Nov. 30	China plays leading role in international sediment research	IRTCES	Xinhua News Agency	√	√	
	Nov. 30	China and UNESCO signed an agreement concerning IRTCES		Chinese Central Government's Official Web, MWR Websites, China Water, IRTCES, WASER, International Network on Erosion and Sedimentation , UNESCO-ISI, IWHR	√		
	Dec. 1	UNESCO-IRTCES Agreement Signing in Ceremony	IRTCES	UNESCO Office Beijing	√		
	Dec. 1	Renewed agreement between the International Research and Training Centre on Erosion and Sedimentation and UNESCO		UNESCO - IHP	√		
	Dec. 1	China plays leading role in international sediment research	IRTCES	People's Daily		√	
	Dec. 3	China and UNESCO signed an agreement concerning IRTCES	IRTCES	Newspaper of China Water Resources		√	

2006	Nov. 30	2nd International Conference on Estuaries and Coasts	IRTCES	MWR Websites, China Water, IRTCES, WASER, International Network on Erosion and Sedimentation , UNESCO-ISI, IWHR	√		
2007	Aug. 4	10 th International Symposium on River Sedimentation,		MWR Websites, China Water, IRTCES, WASER, International Network on Erosion and Sedimentation , UNESCO-ISI, IWHR	√		
2009	May 12	Eco recovery is a long process for quake affected area	Interview Prof. Wang Zhaoyin	Science Time	√	√	
	July 29	China promote advance experiences of flood control on basis of worldwide cooperation in the field of sedimentation	IRTCES Silver Jubilee Minister Chen Lei's speech	China Radio International	√		√
	July 29	Minister Chen Lei of Water Resources made a speech at the IRTCES' 25 th Anniversary Celebration	IRTCES Silver Jubilee Minister Chen Lei's speech	Chinese Central Government's Official Web, MWR Websites, China Water, IRTCES, WASER, International Network on Erosion and Sedimentation , UNESCO-ISI, IWHR	√		
	July 29	Area of soil erosion amounts to 3.56 million square kilometer	IRTCES Silver Jubilee Minister Chen Lei's speech	Xinhua News Agency, China Daily	√	√	
	July 29	Interview Mr. Erdelen, UNESCO ADG attending IRTCES Silver Jubilee	IRTCES Silver Jubilee	CCTV-4			√
	Sep. 16	3rd International Conference on Estuaries & Coasts, Sendai, Japan		MWR Websites, China Water, IRTCES, WASER, International Network on Erosion and Sedimentation , UNESCO-ISI, IWHR	√		

2010	Sep. 10	1th International Symposium on River Sedimentation, Stellenbosch,		MWR Websites, China Water, IRTCES, WASER, International Network on Erosion and Sedimentation , UNESCO-ISI, IWHR	√		
	Aug. 25	China's Recent Floods and Debris Flow Destruction	Interview Prof. Wang Zhaoyin	China Radio International	√		√
	Aug. 26	Measures for Debris flow control	Interview Prof. Wang Zhaoyin	Science Time	√	√	
2011	June 7	ISI Committee member Prof. Zhao-Yin Wang receives ASCE's Hans Albert Einstein Award		UNESCO-IHP, UNESCO-ISI	√		
	Aug. 3	Interview Prof. Wang Zhaoyin on river management		UN Radio			√

It is important to note that the list provided in this appendix does not include numerous IRTCES-related news items that appeared in the web pages of:

- The Ministry of Water Resources of the People's Republic of China (MWR)
<http://www.mwr.gov.cn/english/>
<http://www.mwr.gov.cn/>
- China Water
<http://www.cws.net.cn/>
- International Network on Erosion and Sedimentation, IRTCES
<http://www.irtces.org/english.asp>
<http://www.irtces.org/>
- World Association for Sedimentation and Erosion Research, WASER
<http://www.waser.cn/>
- UNESCO-ISI,
<http://www.irtces.org/isi/>

- The Institute of Water Resources and Hydropower Research (IWHR), the Ministry of Water Resources of the People's Republic of China (MWR).
<http://www.iwhr.com/zgskyww/index.htm>
<http://www.iwhr.com/zswenglish/index.htm>
- etc.

APPENDIX 13 List of International Visitors/Groups

No.	Visitor's institutions or countries	Number	Principal visitors	Visiting time	Main point of visit
1.	Embassy of the Republic of Rwanda to China	2	Mr. M.Benjamin Rugangazi; Mr. Denys Uwimana	April 5, 2006	Meeting for cooperation of research and training on soil erosion control
2.	Chairman of UNESCO-IHP-ISI Steering Committee	2	Prof. Manfred Spreafico and Dr. Michael F. Baumgartner	April 7, 2006	Discussion about Secretariat works of ISI
3.	The Asian Development Bank (ADB)	2	Dr. Phillip G. Wallens Mr. Zhu Shimng	April 25, 2006	To Review of the international programs on watershed management and soil and water conservation conducted by IRTCES
4.	Board of Enjoy Montpellier and Market Development Division France	2	Mr. Francois Barbance and Mr. Alain Formentin	May 19, 2006	To discuss the possible aspects of cooperation, and exploration the possibility of hosting international symposium on river sedimentation in France
5.	UNESCO-IHP-ISI	3	Dr. Khin Ni Ni Thein; Prof. Manfred Spreafico: Dr. Ramasamy Jayakumar	May 26, 2006	To convene The meeting of core members of the UNESCO-IHP-ISI
6.	Japan	1	Prof. Hitoshi Tanaka	June 1 st , 2006	To visit IRTCES to discuss the organization of 3 rd ICEC-2009
7.	UNESCO Chairs Programme	1	Dr. W. F. Ghag	June 2, 2006	To visit IRTCES and discuss organization of training activities
8.	University of Brussels; WASER founding member, Belgium	1	Prof. Michel A. Verbanck	July 20,2006	To explore possibility of future cooperation
9.	Participants from US, the Netherlands, United Kingdoms, France and China	80	Sam. Y. Wang;	Nov.25 ~26, 2006	To attend the Second Sino-American Workshop on Advanced Computational Modeling in Hydrosience and Engineering

10.	Participants from more than 20 countries or regions	260		Nov.28~30 2006	Attend the 2nd International Conference on Estuaries and Coasts (ICEC) in Guanzhou
11.	UNESCO Tehran Cluster Office	1	Representative and Director: Mr. Abdin Salih	June 19, 2007	To explore potential cooperation between IRTCES and countries covered by the UNESCO Tehran Cluster Office, cooperation among the UNESCO category II centers
12.	Participants from 12 countries including Afghanistan, DPRK, India, Iran, Madagascar, Malawi, Mongolia, Philippines, Russia, Sudan, Uzbekistan and China followed the training workshop. The lectures were given by experts from China and Switzerland.			Oct. 10-16,2007	To participate in training workshop of reservoir sedimentation management
13.	UNESCO-IHP-ISI	2	Prof. Manfred Spreafico, Chairman of UNESCO-IHP-ISI and Head of Swiss National Hydrological Survey	October 12, 2007	Visit to the IRTCES that acting as the ISI Technical Secretariat.
14.	England	1	Sarah Gorge	August 29, 2007	Cooperative work for IJSR
15.	Universiti Teknologi Mara (UiTM), Malaysia	3	Prof. Dr. Roslan Zainal Abidin, Director of National Soil Erosion Research Centre (NASEC), UiTM	March 2008	The signing ceremony of the Memorandum of Understanding between IRTCES, China and Universiti Teknologi Mara (UiTM), Malaysia

16.	UNESCO	2	Dr. András Szöllösi-Nagy, Deputy Assistant Director General of UNESCO Dr. Ramasamy Jayakumar	May 28, 2008	To exchange ideas and information between UNESCO-IHP and IRTCES
17.	Members of UNESCO-IHP-ISI Steering Committee	18	Prof. Manfred Spreafico, etc., Desmond E. Walling	November 5-7, 2008	Attend the 6th International Sediment Initiative Steering Committee Meeting and Workshop
18.	Members of IRTCES International Advisory Council	10	Mr. Abhimanyu Singh; Dr. Anil Mishra;	November 6, 2008	To attend the 7th IRTCES Advisory Council Meeting
19.	Oceanography & Coastal Sciences Louisiana State University, USA	1	Donald M. Baltz	May, 2008	Academic communication
20.	ICID	1	Mr. Peter Lee	Oct. 5-9, 2008	Technical Exchange and development of collaborative relationship
21.	UNICEF	2	Dr. Hans, Mrs. Lei Jun	May 5-7, 2008	Development of collaborative project
22.	Brazil	1	Fabio de Souza	Oct. 2008- Oct. 2010	Post doctorate research
23.	UNESCO	1	Dr. András Szöllösi-Nagy,	April 17, 2009	Seminar on Global Climate Change and Water Resources for IRTCES Silver Jubilee celebration
24.	UNESCO and UNESCO Beijing Office	3	Mr. Walter R. Erdelen, Assistant Director General for Natural Science, Mr. A. Singh, Director R. Jayakumar, UNESCO BEJ Office	July 29 2009	To attend IRTCES Silver Jubilee celebration and Seminar on Integrated River Basin Management under Global Climate Change

25.	Participants of The Advanced Training Workshop on Integrated River Basin Management	51	51 participants from 18 countries including Afghanistan, Australia, Bangladesh, DPRK, Hungary, India, Iran, Indonesia, Myanmar, Mongolia, Nepal, Romania, Sri Lanka, Sudan, Uganda, Uzbekistan	July 27-Aug. 3 2009	To attend IRTCES Silver Jubilee celebration activities and the training workshop
26.	Hungary	7	Hungarian State Secretary of Ministry for Environment and Water László KÓTHAY	October 12 2009	To understand IRTCES operation on the financial sources, training program, publications, staff, history and other basic information of the organization, and potential cooperation discussed.
27.	UNICEF	2	Dr. Yang Zhengbo, Mrs. Lei Jun	July 6-9, 2009	Review of collaborative project
28.	Marquette University, America	1	Prof. Steve Melching	Jan.- Dec.2006; Aug. -Sep. 2009	Collaborative research
29.					
30.	The University of Natural Resource and Applied Life Sciences, Vienna, Austria	1	Carmen Zehetbauer	July 7,2009	Master Study
31.					

32.	ADB	1	Mr. Ramon Alikpala, Manager of the Asian-Pacific Water Forum's KnowledgeHubs Secretariat and official of Regional and Sustainable Development Department of ADB	May 17 2010	To visit IRTCES for exchange and discussion of the role and its activities as a erosion and sedimentation knowledge hub
33.	WASWAC	2	Mr. Samran Sombatpanit and Dr. Karika Kunta	June,19,2010	Discussing on work of Secretariat of WASWAC
34.	UNESCO UNESCO BEJ Office	2	Ms. Gretchen Kalonji, Assistant Director-General for the Natural Sciences, and Mr. Jayakumar	September 10, 2010	Visit IRTCES to understand IRTCES activities in UNESCO-IHP framwork
35.	Auckland University, New Zealand	4	Prof. Gary John Brierley, Mr. Bredon, Mr. Alan Kwok Lun Cheung, Mr. Brendon Tatnell Blue, Mr. Simon James Aiken,	July 20, 2010	Meeting for collaboration project
36.	ICID	2	Prof. Chandra Madramootoo, Dr. Karim Shiati	May 5-10, 2010	Technical Exchange and development of collaborative relationship
37.	Natural Heritage Institute (NHI), USA	3	Mr. Gregory A. Thomas	March 29, 2011	Meeting for cooperation
38.	UNESCO	2	Ms. Barbara Torggler, Principal Evaluation Specialist of the Evaluation Section of UNESCO's IOS and Ms. Ekaterina Sediakina,	June28 2011	To check and review IRTCES role and activities under UNESCO-IHP framework acting as one of the UNESCO's Category II Centres

			Associate Evaluation Specialist of the IOS		
39.	Land Development Department, Thailand	7	Mr. Anusorn Chantanaroj	August 23,2011	Meeting for cooperation
40.	Auckland University, New Zealand	5	Prof. Gary John Brierley, Mr. Bredon, Mr. Alan Kwok Lun Cheung, Mr. Brendon Tatnell Blue, Mr. Simon James Aiken, Ms. Nicoll, Tami Jo-Allen	August 1, 2011	Collaborative project sponsored by MOST
41.	Land Development Department, Thailand	12	Mr. Thavatchai Samrongwatana	July 19,2011	Meeting for cooperation
42.	Participants of the International Advance Training Workshop on Water and Soil Conservation	30	15 countries	Sept.13-19 2011	To attend the training workshop
43.	ICID	11	Prof. Chandra Madramootoo, Mr. M. Gopalakrisnan	July 11-15, 2011	International Workshop on Water Saving and Food Security
44.	IWMI- Pakistan	7	Mr. Khalid Mohtadullah, Mr. Rab Nawaz, Mr. Muhammad Ishfaq Khan, Mark Frank Giordano, Dr. Asad Sarwar Qureshi,	June 14-22, 2011	Technical Exchange on Water Management
45.	USDA, USA	1	Dr. Bert Clemmens	Feb. 22-26, 2011	Technical Exchange and development of collaborative project
46.	Sweden Royal Technology University, Sweden	1	Prof. Jerry Yan	Aug. 11-15, 2011	Development of collaborative project

APPENDIX 14 List of Overseas Business Trips

No.	Participants	Countries visited	Time	Mission description	Financial resource
1.	Tang Liqun	Bangkok, Thailand	April 26, 2006	Attend the UNESCO-IHP International Sediment Initiative(ISI) Workshop on Sediment Management in South and Southeast Asia	UNESCO
2.	Wang Yangui; Liu Xiaoying	UK Italy	June 23 to July 4, 2006.	Invited by Prof. Des Walling and Prof. G. Disivio, to visit the Exeter University, Cardiff University in UK and CESI RICERCA SpA in Italy for scientific exchange and discussion of future initiative and plans of the WASER	IRTCS
3.	Hu Chunhong and Liu Cheng	Paris, France	July 3-7, 2006	Attend 17 th session of the IHP Intergovernmental Council	IRTCS
4.	An Bo	Pyongyang, DPRK	June 13-17, 2006	Invited by UNESCO Beijing Office to the State Hydrometeorological administration (SHMA) DPRK, to give Lectures for the Training course on Flood Forecasting and Preparedness	UNESCO
5.	Wang Zhaoyin and Liu Cheng	Khartoum Sudan	Nov. 11-15, 2006	Attend the 5th International Sediment Initiative (ISI) Steering Committee Meeting and workshop	UNESCO
6.	Hu Chunhong, Chen Jianguo, Tong Yuling, Fan Zhao	South Africa	October 23- Nov. 2. 2006	Invited by the Stellenbosch University, Republic of South Africa to discuss organization of 11 th ISRS and visit laboratories and exchange research programs	IRTCS
7.	Gao Zhanyi	Kuala Lumpur, Malaysia	Sept. 10-17, 2006	Attending 57 th IEC meeting of ICID	IRTCS
8.	Wang Zhaoyin	Lisbon, Portugal,	Sep. 2006	Attend IAHR International Conference on Fluvial Hydraulics - River Flow 2006 and make keynote lecture	LOC and Subject funds
9.	Wang Zhaoyin	Khartoum, Sudan	Nov. 2006	Attend International Sediment Initiative Conference (ISIC) and make keynote lecture	UNESCO
10.	HU Chunhong;	Moscow,	August	Invited by Moscow University to	UNESCO

	Yu Qiyang, etc.,	Russia	1~4, 2007.	attend the 10 th ISRS as ISRS permanent secretariat to provide organizational assistance to Local organizer and make keynote lecture and paper presentations	IRTCES
11.	Wang Zhaoyin	Charlooz, Iran	June, 2007	Attend International symposium on Sedimentation and Environment in Arid Areas and make keynote lecture	UNESCO
12.	Shi Hongling	Charlooz, Iran	April 14-22 2007	Attend the Expert meeting on Sedimentation and Erosion in Arid and Semi-Arid Regions”	IRTCES
13.	Yu Qiyang	Delft The Netherlands	June 11-15, 2007	Prof. R.A. Meganck, PhD, Director of UNESCO-IHE Institute for Water Education UNESCO-IHE to participate in UNESCO Directors meeting on 11-12 June and Symposium – Water for a Changing World	IRTCES
14.	Hu Chunhong, Wang Yangui, Liu Cheng, Chen Jianguo	Bangkok Thailand and New Delhi India	18-27 Sept. 2007	Invited by the UNESCO Office in Jakarta (Regional Science Bureau for Asia and the Pacific to attend the Category II Centres Meeting in UNESCO Bangkok Office; and visit NHPC, India to discuss program cooperation	IRTCES
15.	Tong Yuling	Singapor	29-31 Oct.2007	Invited by the Public Utilities Bureau of Singapore to attend the Regional Consultation Meeting for candidate water knowledge hubs	IRTCES
16.	Gao Zhanyi	Phnom Penh, Cambodia	Sept. 3- Oct. 5 2007	Technical Assistance	FAO
17.	Gao Zhanyi	Sacramento, USA	Sept. 30-Oct. 5, 2007	Attending 58 th IEC meeting of ICID	IRTCES
18.	Wang Zhaoyin	Charlooz, Iran	June, 2007	Attend International symposium on Sedimentation and Environment in Arid Areas and make keynote lecture	UNESCO

19.	Wang Zhaoyin	Okinawa, Japan,	June 2007.	Attend 7th Conference of the Science Council of Asia and make keynote lecture	LOC
20.	Hu Chunhong, Liu Cheng, Chen Jianguo, Fan Zhao	Switzerla nd and Italy	April 23- May 2, 2008	Invited by Chairman of UNESCO-ISI, Federal Office for the Environment, Switzerland and Padova University of Italy to attend the 4th ISI Steering Committee Meeting and the International Workshop Erosion, Transport and Deposition of Sediments	IRTCS
21.	Tong Yuling	Singapor e	2-4 April 2008	Invited Asia-Pacific Water Knowledge Hubs network to attend the 2nd Regional Water Knowledge Hub Meeting	IRTCS
22.	Zhang Yanjing	Indonesi a	Feb.20- 22 2008,	Attend the 3rd general meeting of NARBO	IRTCS
23.	Yu Qiyang, Wang Yangui, Shi Hongling, etc	Hawaii USA	May 12- 21, 2008	Invited by the University of Mississippi, USA to attend the Third US-China Workshop on Advanced Computational Modeling in Hydroscience and Engineering with paper presentations	IRTCS
24.	Gao Zhanyi	Lahore, Pakistan	Oct. 13- 19, 2008	Attending 20 th ICID Congress and 59 th IEC meeting of ICID	IRTCS
25.	Mr. Kuang Shangfu	Istanbul , Turkey	Mar. 16 ~22, 2009	Attend The 5th World Water Forum	IWHR
26.	Mr. Kuang Shangfu	Iceland	June 23, 2009	Attend World Congress 2009	IWHR
27.	Hu Chunhong, Liu Guangquan, Liu Cheng, etc	Japan	Sept.13- 20, 2009	To attend the third International Conference on Estuaries & Coasts (ICEC-2009) , visit Kyoto University and sign MOU between two IRTCES and ICHARM	IRTCS UNESCO
28.	Liu Xiaoying	Iran	October 18-23, 2009	Invited by RCUWM to attend the International Symposium on Reservoir Sedimentation Control and give a Keynote lecture	LOC
29.	Wang Yanggui	Canada	Aug. 9 - 17, 2009	To attend the 33rd IAHR Congress and make paper presentation	IRTCS

30.	Gao Zhanyi	New Delhi	Dec. 6-11, 2009	Attending 60 th IEC meeting of ICID	IRTCES
31.	Gao Zhanyi	Washington, USA	July 6-12, 2009	Attending US-China Joint Working Group Meeting	IRTCES
32.	Gao Zhanyi	Istanbul, Turkey	March 16-22, 2009	Attending 5 th World Water Forum	IRTCES
33.	Wang Zhaoyin	Auckland, New Zealand	Jan. 2009	Attend Workshop on River Morphology and Ecology and make invited lecture	LOC and Subject funds
34.	Wang Zhaoyin	Hong Kong, China	Dec.	Attend International Symposium on Recent Development in Nearshore Coastal Water Quality Research and invited lecture	Host
35.	Wang Zhaoyin	Roquetes-Tortosa, Catalonia, Spain	May, 2009.	Attend International Workshop on Sediment Management Options for Regulated Rivers and make keynote lecture	Host and Subject funds
36.	Hu Chunhong and Liu Cheng	Paris, France	July 7-10, 2010	Attend 19th session of the IHP Intergovernmental Council	IRTCES
37.	Ning Dunhu And Liu Cheng	Switzerland	March 4-9 2010	Invited by ISI Chairman and the Swiss Federal Office for the Environment to attend the UNESCO - IHP/ISI planning meeting	IRTCES LOC.
38.	Hu Chunhong, Liu Cheng, Liu Xiaoying and Zhang Yanjing	South Africa	Sept. 3-12, 2010	Invited by the University of Stellenbosch, South Africa to attend the 10 th ISRS as ISRS permanent secretariat to provide organizational assistance to Local organizer and make keynote lecture and paper presentations	IRTCES
39.	Gao Zhanyi	Montral, Canada	Oct. 19-21, 2010	Attending McGill 3 rd Global Food Security Conference	
40.	Gao Zhanyi	Yogyakarta, Indonesia	Oct. 10-16, 2010	Attending 61st IEC meeting of ICID	
41.	Wang Zhaoyin	KYOTO, JAPAN	Aug24-27,2010	Attend international Symposium on Sediment Disasters & River Environment in Mountainous Area and make	Host

				invited lecture	
42.	Wang Zhaoyin	Warsaw, Poland	June 2010.	Attend International Conference on Sediment Dynamics for a Changing Future and make Keynote lecture	Subject funds
43.	Wang Zhaoyin	Seoul, South Korea	Sep. 2010	Attend 8th IAHR International Symposium on Eco-hydraulics and make invited lecture	LOC and Subject funds
44.	Wang Zhaoyin	Stellenbosch, South Africa	Sep. 2010	Attend 11th International Symposium on River Sedimentation and make keynote lecture and give lectures to students	LOC and Subject funds
45.	Liu Cheng	Islamabad, Pakistan	Jan. 22-28, 2011	Attend Workshop on 'Education for Managing Hydrological Extremes and Related Geo-Hazards' and make presentation	UNESCO
46.	Liu Cheng	Austria	April 11-17, 2011	To attend the ISI Steering Committee Core Member Meeting and International Conference on the Status and Future of the World's Large Rivers	UNESCO IRTCES
47.	Hu Chunhong, Chen Jianguo and Liu Cheng	Vietnam and Malaysia	Sept.20-30 2011	Invited by the Water Resource University of Vietnam and the Uniersiti Teknologi MARA Malaysia to discuss organization works of 4th ICEC-2012 and cooperation in research works	IRTCES
48.	Wang Yangui	Australia	June 25-July 3 2011	To attend the 34 th IAHR World Congress and make paper presentation	IRTCES
49.	Gao Zhanyi	Roma, Italy	May 29-June 3, 2011	Attending FAO and IFAD workshop on Multiple Use Services (MUS) system	IFAD
50.	Gao Zhanyi	Colombo, Sri Lanka	Feb. 27 – March 5, 2011	Attending Workshop on Climate change and food security	GWP
51.	Wang Zhaoyin	Palm Springs, USA	May 2011	Accept Hans Albert Einstein Award and attend ASCE World Environmental and Water Resources Congress 2011	Subject funds
52.	Wang Zhaoyin	Brisbane, Australia	June 2011	Attend 34th IAHR Congress	Subject funds