

Agreement on Framework of “China-US Joint Research Center for Ecosystem and Environmental Change”

1. Background and Goal

Existing evidence has shown that ecosystem fluxes and environmental problems in regional ecosystems are closely related to the economic development, energy use, social mode, and natural geographical conditions of the regions. Comparison of ecosystem processes and environmental changes as well as their driving mechanisms between China and the USA is essential for advancing our understanding of the mechanisms governing the relationship between regional/global ecosystem processes and environmental changes. The comparative study will facilitate exploration of sustainable strategies and approaches for human to manipulate eco-environmental systems.

In the research of ecosystem and environmental sciences, the Institute of Geographical Science and Natural Resources Research (IGSNRR) and Research Center for Eco-Environmental Study (RCEES) of the Chinese Academy of Sciences (CAS) have established a very good relationship with Center for Environmental Biotechnology (CEB) and Institute for Secure and Sustainable Environment (ISSE) of the University of Tennessee (UT) as well as UT-Oak Ridge National Laboratory (ORNL) joint research institute for biological sciences (JIBS). To enhance the existing international collaboration, UT suggested launching up a “China-US Joint Research Center for Ecosystem and Environmental Changes”, which comprises IGSNRR, RCEES, ISSE, and UT-ORNL JIBS.

The overall goals of the “Joint Research Center” are to implement multi-scale research projects, exchange scientific information, provide students and young scientists with international education and technical training opportunities, and serve as a scientific forum for international cooperation and a scientific center for long-term study of the complicated interactions of ecosystem fluxes with environmental changes associated with human activities.

2. Mechanisms of Cooperation

The “China-US Joint Research Center for Ecosystem and Environmental Changes” will be operated mainly through the following four mechanisms. Mutual agreements for concrete research programs will be signed according to the specific requirements identified during the cooperation.

(1) Research Collaboration

With an aim of understanding the influences of global climatic change and human activities on dynamic processes of regional/global eco-environmental systems and the underlying mechanisms, a series of sets of cross-regional studies will be implemented through international collaboration to compare the interactive relationships among human disturbance, dynamics of eco-environmental system, and climatic changes in the regions of China and the

USA.

(2) Academic Exchange

Effective mechanisms for information exchange and academic discussion will be established by all parts of the “Joint Research Center”. The scientists will be scheduled to visit the partner’s laboratories for project research and information exchange. The research facilities, field observational sites, data resources will be shared among the collaborators for joint publications of high-impact international scientific articles. A variety of international conferences and workshops will be organized.

(3) Student Education

The “Joint Research Center” will provide students and young scientists with extensive opportunities for academic visiting, information exchange, experimental study in the laboratories of the collaborators, manuscript writing, and co-advice on thesis.

(4) Technical Transfer and Trainings

According to the requirements and research schedules of all collaborative parts, technology transfer and training classes for specific skills and tools will be organized at the locations identified by all parts.

3. Research Areas

The “Joint Research Center” will be dedicated to develop a series of international cooperative research programs that focus on understanding of the mechanisms of ecosystem and environmental changes that are drivers of global climatic change and human activities, as well as development of human’s manipulation strategies and approaches. The overall scientific goals are (1) to make comprehensive study on the influences of regional economic development and human behaviors and activities on conditions of various ecosystem and natural environments, and (2) to explore effective strategies and approaches for human to regulate and manage various ecosystems and environmental processes. At present, we propose to initiate the collaboration by addressing the following four main themes.

Theme 1: Ecosystem Processes and Management

By focusing on the human-ecosystem-climate interactions at regional and global scales, a series of innovative researches will be performed to develop sustainable measures for human’s manipulation and management on vulnerable eco-environmental systems. The focuses include:

- Influences of global change and human activities on coupled ecosystem C-N-water processes
- Theories and technologies for assessment and prediction of ecosystem and environmental changes
- Strategies and technologies for restoration of degraded ecosystems and contaminated environments

Theme 2: Environmental Sustainability of Bioenergy Production

The production of liquid fuels and non-carbon energy sources from renewable biomass and bioprocessing is expected to become critically important to economic and energy security for any nation attending to meet its energy demands in future years. Fundamental research and knowledge is needed to insure that bioenergy production can be achieved in a carbon neutral, environmentally sustainable manner.

- Development and transfer of bioenergy technologies
- Evaluation of the eco-environmental adaptation of genetically engineered plants
- Contribution of bioenergy production to sustainability of eco-environmental systems and economy
- Influence of bioenergy exploration on regional C-N-water cycles

Theme 3: Ecological Foundation of Water Resources and Quality

Distribution and quality of water resources are closely related to ecosystem processes. Ecosystem can considerably determine the large-scale cycle of water resources and mitigate water contamination. Therefore, it is very important to study the ecological approaches to manipulating the C-N-water fluxes in regional ecosystems, as well as their benefits to sustainability of environment and economy. The current researches focus on the following issues:

- Influence of ecosystem processes on water resource distribution
- Ecological manipulation on water quality in watersheds
- Loading capability of regional water resources for bioenergy production and ecosystem carbon sequestration

Theme 4: Technologies for improvement of eco-environmental systems

Integrated ecological measures and environmental technologies are sustainable approaches to solving the problems of ecosystem degradation and environmental contamination. Sound eco-environmental planning can greatly improve the quality of soils, water bodies, and air. The “Joint Research Center” will perform the following researches:

- Technologies for bio-remediation of contaminated ecosystems
- Ecological approaches to improving air quality
- Technologies for improvement of watershed environments

4. Mechanisms for Operation

4.1 Collaborative partners

“The China-US Joint Research Center for Ecosystem and Environmental Changes” will be set up jointly by IGSNRR and RCEES of CAS, CEB/ISSE of UT, and UT-ORNL JIBS.

4.2 Mechanisms for Operation

“The Joint Research Center” will be led by an Executive Committee (Appendix 1), with the support of an Organizing Committee (Appendix 2) and a Scientific Advisory Committee (Appendix 3).

The Executive Committee includes co-chairmen and secretaries, and is responsible for assuring the success of the projects by monitoring the progress and integration of the suggestions by the Scientific Advisory Committee and the Organizing Committee.

The Organizing Committee is composed of the high level leaders in each government’s agencies or departments whose portfolio deals with the broad issues of climate and environmental changes and policy-level decisions. The role of this committee is to look at the “Big Picture” and assures that the Advisory Committee establishes a balanced and effective set of action plans, and that communication and synchronization of effects are reasonable and successful.

The Scientific Advisory Committee includes senior, highly regarded scientists within each discipline. This committee will play a critical functioning in making the long-term research plans and reviewing their progresses.

4.3 Funding for Operation

The funds for regular operation of “The Joint Research Center” will be mainly obtained from respective governments. Funds for collaborative research programs will be applied by Chinese and American scientists from their governments and also from relevant international organizations or agencies by submitting joint application. The funds will be used for experimental observation, purchase of equipments, personnel trainings, student education, and academic activities (workshop or conference).

4.4 Duration of Cooperation

The first duration: October 1, 2006 ~ September 30, 2011

5. Signatures of Representatives of All Collaborative Institutions

The four institutes (IGSNRR-CAS, RCEES-CAS, ISSE/CEB-UT, and UT-ORNL JIBS) agree to initiate and develop the “China-US Joint Research Center for Ecosystem and Environmental Changes”. These collaborative partners will work together on an equal and win-win basis to secure appropriate resources needed for the ultimate goals of the “Joint Research Center”.

Distinguished Professor Gary S. Saylor

Director, The UT-ORNL Joint Institute of
Biological Sciences, Oak Ridge National Laboratory
Department of Energy, USA

Signature: _____

Date: July 20, 2006

Professor John F. McCarthy

Chair, Environmental Carbon Research Section
The Institute of Secure and Sustainable Environments
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Date: July 20, 2006

Professor Ji-Yuan Liu

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