

## IPSI Collaborative Activity Proposal Form

The following form is for use when submitting proposed IPSI Collaborative Activities for consideration by the IPSI Steering Committee. See the Collaborative Activity Guidelines on p. 3 for more information.

Please return the completed form to the IPSI Secretariat ([isi@unu.edu](mailto:isi@unu.edu)).

*IPSI Collaborative Activities are the activities that shall be undertaken by more than one IPSI member and constitute an important part of IPSI activities with the purpose of fostering collaboration within the IPSI membership and implementing the IPSI Strategy and Plan of Action. The IPSI Collaborative Activities shall be developed and implemented with the endorsement of the Steering Committee in accordance with the Collaborative Activity Guidelines. Resource mobilization for IPSI collaborative activities shall be the responsibility of the implementing members in principle. – IPSI Operational Guidelines, Chapter 5.4*

<b>Date of Application:</b>	<b>2016.09.30</b>
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<b>Project title:</b>
Integrated project of enhancing ecoagriculture and sustainable development of rural Taiwan through international cooperation
<b>Collaborating organizations (IPSI members):</b> <i>(*Please underline the leading organization)</i>
*Hualien District Agricultural Research and Extension Station, Council of Agriculture, Taiwan(HDARES) National Dong-Hwa University(NDHU)
<b>Other contributing organization(s) (including IPSI non-members):</b>
Council of Agriculture, Taiwan(COA); National Taiwan University(NTU); Miaoli District Agricultural Research and Extension Station, Council of Agriculture, Taiwan(MDARES); Chinese Taipei Committee, International Commission on Irrigation Drainage(CTCID); Agricultural Engineering Research Center(AERC)
<b>Expected term (e.g. 1 January 2014 – 31 December 2015):</b>
<b>1 June 2016– 31 December 2020</b>
<b>IPSI strategic objective(s) addressed (tick all that apply; see p. 3 for more details):</b>
<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> 1. Increase knowledge and understanding of SEPLS</li> <li><input checked="" type="checkbox"/> 2. Address direct and underlying causes responsible for the decline or loss of SEPLS</li> <li><input checked="" type="checkbox"/> 3. Enhance benefits from SEPLS</li> <li><input checked="" type="checkbox"/> 4. Enhance human, institutional and sustainable financial capacities</li> </ul>

*Continued on next page.*

**Description of the activity:**

Please provide as much information as possible on:

- Background
- Activities (including site locations if applicable)
- Expected outcomes
- Actors and task sharing
- How the activity relates to the *IPSI Strategy* and *IPSI Plan of Action*
- Resources, funding
- Monitoring and reporting

**1. Background and goals**

The global population has grown rapidly while the agricultural production environment of food supply is suffering from uneven development between urban and rural areas, rural traditional culture loss, degradation of agricultural production and ecological environment and food safety crisis due to the impact of modernization, climate change and conventional farming methods. Application of massive fertilizers and pesticides reduces the biological diversity and brings about the degradation of ecosystem services; climate change makes rainstorms and droughts more frequent and intensive, which negatively affect the agricultural water supply safety as well as the water quality. Faced with such situation, the agriculture in advanced countries has already been working on ecologically friendly agriculture while Taiwan is just in the starting phase. In order to promote ecoagriculture and sustainable rural development with the help of international cooperation, this integrated project will especially learn from the idea of ecosystem services and agrobiodiversity, develop innovative policy, strategies and measures suitable for landscape-scale and community-based farming in line with relevant international instruments through taking part in IPSI, IUCN and LEGATO project (Land-use intensity and Ecological Engineering – Assessment Tools for risks and Opportunities in irrigated rice based production systems).

Therefore, the goals of this integrated project are as followings:

- Learn from innovative international concepts and contribute Taiwan's experience to international societies
- Explore relevant policies and strategies for revitalization of socio-ecological production landscapes in rural Taiwan
- Develop innovative agricultural technology and farming practices to increase agrobiodiversity and productivities of paddy fields while maintaining ecosystem services provided by surrounding landscapes
- Enhance adaptive capacity of rural communities through collaborative planning and management

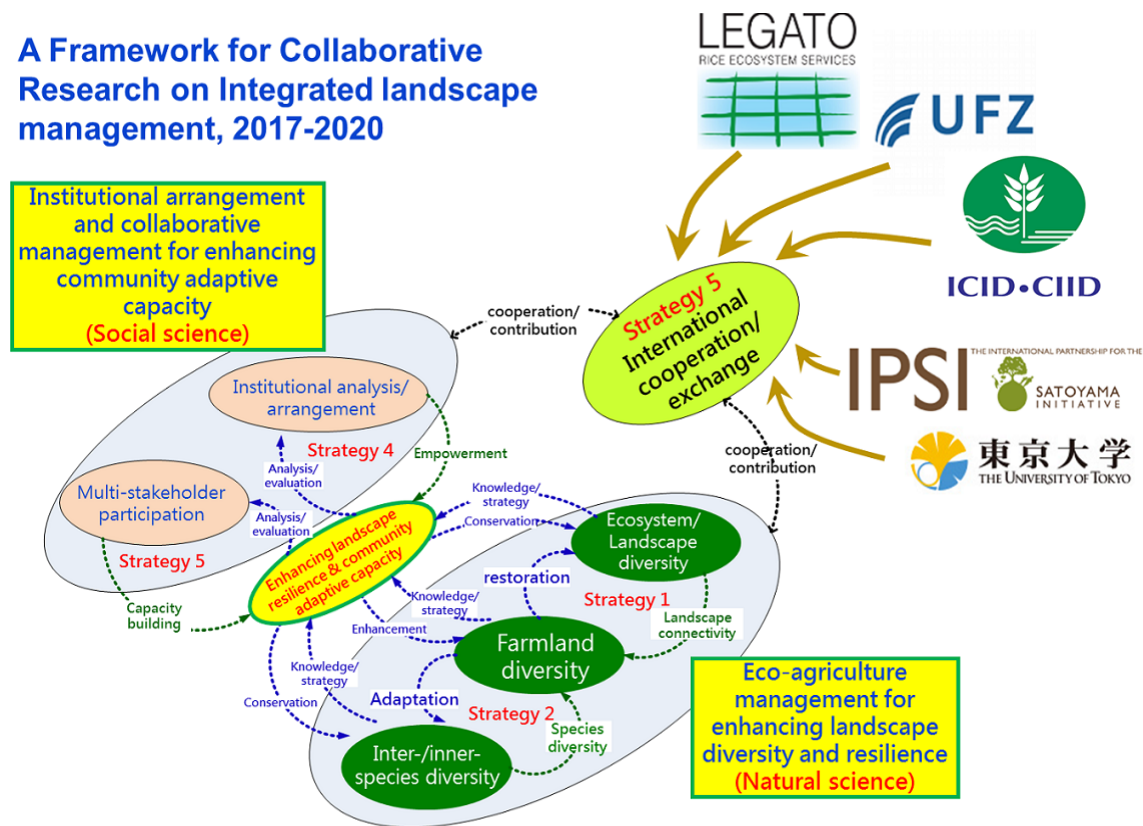
**2. Activities**

This integrated project will be led by Hualien District Agricultural Research and Extension Station(HDARES) and implemented cooperatively by involving National Dong Hwa University(NDHU), National Taiwan University(NTU), Agricultural Engineering Research Center(AERC), Miaoli District Agricultural Research and Extension Station (MDARES), Chinese Taipei Committee, International Commission on Irrigation Drainage(CTCID). The framework for collaborative research is like the figure below. The main research strategy is to combine efforts of social science and natural science studies with a focus of enhancing landscape resilience and community adaptive capacity that can be learnt especially from relevant international institutions such as IPSI, LEGATO, UFZ, University of Tokyo and the water conservation organization ICID. The five research strategies and related important tasks are as below:

- (1) Increase the diversity and resilience of agricultural production landscapes (HDARES, NTU, and MDARES).
  - Research the current situation of agricultural landscapes resource and the situation of landscape fragmentation in east and west of Taiwan.
  - Study the impact of different farming methods on the agricultural biological diversity of paddy fields and create the index database for in east and west of Taiwan.

- By means of international communication, study the ecosystem service and assessment technology of the paddy fields and landscapes in east and west of Taiwan.
- Establish paddy fields and landscapes for other crops to increase the diversity of habitats.

## A Framework for Collaborative Research on Integrated landscape management, 2017-2020



- (2) Increase agrobiodiversity of paddy fields and enhance ecosystem services by habitat restoration within and surrounding the farmlands (HDARES, NTU, MDARES, and CTCID).
  - Create diversity and abundance of the pests and their natural enemies on the paddy fields.
  - State the connection between biological diversity index and the quality and quantity of rice.
  - Test the influence of habitats management on the food chain (net) on the paddy fields and state the operating mechanism.
  - Conduct the survey measurement on micro climate of paddy fields, active radiation of photosynthesis and rice sampling.
  - Figure out the water demand difference of crops on the paddy fields under ecological engineering and conventional farming.
- (3) Enhance adaptive capacity of rural communities through collaborative planning and multi-stakeholder participation (NDHU and NTU).
  - Choose case study areas with satoyama-like, satoumi-like and satochi-like landscapes in eastern and western rural Taiwan; conduct participatory action research for increasing adaptive capacity of rural communities.
  - Develop workable indicators of resilience in socio-ecological production landscapes for evaluation of current situation and monitoring of future progress
  - Develop feasible frameworks for planning and management of community-based ecoagriculture development.
- (4) Explore relevant international policies for promoting ecoagriculture in Taiwan (NTU and CTCID).
  - Analyze the international policies and strategies of ecological agriculture and grasp the dynamic trend.
  - Analyze the differences between the ecological agriculture policies and strategies at home and

abroad and put forward the coping strategies.

- Analyze the water resource changes in specific situations and put forward the restoration and management measures of coastal wetlands so as to improve the efficiency of water control.
- Through international communication, develop innovative method for water management during dry period.

(5) Learn from innovative international technology and practices and contribute Taiwan's experience to international societies (HDARES, NDHU, NTU, and CTCID).

- Hold international seminar to share the experiences on the implementation of ecological agriculture policies and strategies so as to establish cooperative mechanism.
- Conduct training in the form of workshop on the practice, case and tool of ecological agriculture strategies.
- Interview the internationally famous ecological agriculture program execution organizations and establish follow-up cooperation.
- Enhance the quantity and energy of academic activities among organizations and countries, display the research achievements and become outstanding in the international field.

### **3. Expected outcomes**

- Create the index database of biological diversity on different paddy fields and landscapes, and understand the mutual impact between the paddy biology and surrounding landscapes so as to provide information for the pest control of epidemic prevention units and farmers. Through this it indirectly helps the farmers reduce 20% of pesticide because of the construction of ecological environment.
- The paddy field living environment can increase the diversity and abundance of beneficial insects for one to two times, thus maintain the ecosystem service and indirectly increase farmers' harvest on the crop production.
- Create agricultural biodiversity index and provide the monitoring results of the specified species to policy makers for them to make environmental management measures suitable for the situation of agriculture, which indirectly increases the public's awareness on protecting the environment by 10%.
- Complete the analysis on the irrigation water volume of paddy fields under ecological engineering and conventional farming; develop localized intelligent irrigation methods which are suitable for water resource and ecological environment; make production policies for planting suitable crops on suitable fields; apply systematical automatic monitoring equipment to improve the strategies of water-use efficiency and the harvest on crop production. Provide the above strategies to competent authorities like the Department of Irrigation and Engineering and the agricultural and food agency for them to conduct the implementation. Provide relevant test research institutes to promote environmental management system.
- With the planning method of landscapes orientation and diverse parties of rights and interests, assist three rural communities planning and implement the ecological-agriculture-based leisure agriculture tour through various forms such as ecological and cultural tourism, ecological agriculture education and interpretation and farm experience, which indirectly facilitates the job opportunity of the community (activate the human resource of the community) and other relevant benefits.
- Establish the ecological agriculture cooperatively management model suitable for the rural areas in east and west of Taiwan and the resilience index monitoring tool of the agricultural production landscapes, which indirectly promotes and implement this concept in three communities and increase the community's support to this value.
- Develop innovative method for water management during dry period of the agricultural ecology in dry seasons at home; research the water environmental changes under different situations so as to put forward the restoration and management measures of coastal wetlands as well as the measures for rational utilization, and the advice which facilitates the contingency management units such as the Department of Irrigation and Engineering to improve the efficiency on comprehensive water control.
- Promote the technical research and development on the sustainable development of rural areas and

ecoagriculture of Taiwan internationally and the cultivation of talents, and increase international support to Taiwan's research on eco-agriculture.

#### 4. Actors and task sharing

- Academics: Hualien District Agricultural Research and Extension Station is the project leader and coordinator
- Governmental Institutions: Council of Agriculture, Executive Yuan is the key project supporter
- IPSI members: National Dong-Hwa University
- IPSI non-members: National Taiwan University; Miaoli District Agricultural Research and Extension Station; International Commission on Irrigation Drainage; Agricultural Engineering Research Center

#### 5. How the activity relates to the IPSI Strategy and IPSI Plan of Action

According to the five target strategies and expected results of this integrated project, it can cover the four strategies of IPSI and the prior measures a to h which comply to IPSI plan:

- Increase the diversity and resilience of agricultural production landscapes: f
- Increase agrobiodiversity of paddy fields and enhance ecosystem services by habitat restoration within and surrounding the farmlands: d
- Enhance adaptive capacity of rural communities through collaborative planning and multi-stakeholder participation: b, e
- Explore relevant international policies for promoting ecoagriculture in Taiwan: a
- Learn from innovative international technology and practices and contribute Taiwan's experience to international societies: a, c, g, h

#### 6. Resources, funding

The financial resources for conducting this collaborative project will be mainly from Council of Agriculture, Taiwan; The budget for this four-year collaborative project is about US\$ 3,000,000

#### 7. Monitoring and reporting

Annual Project Progress Reports will be submitted to the Council of Agriculture and will be available online (in Chinese). We will be keen to share important findings and progress to IPSI Secretariat and relevant conferences and workshops.

Photo 1 Example of satoyama-like landscapes as case study areas



Photo 2 Example of satochi-like landscapes as case study areas



Photo 3 Example of satoumi-like landscapes as case study areas

