

# Enhancing the Impact of Research for Development: A Pilot Competitive Grants Program to support innovative partnerships and projects

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Organization description and date established	AIT, is an international academic institute established in 1959, that promotes technological change and sustainable development in the Asian-Pacific region through higher education, research and outreach. It is actively working with public and private sector partners throughout the region and with some of the top universities in the world to address issues pertinent to developing nations.

## II. Project Details

Title of Proposal	Linking Thai Jasmine Rice farmers with markets using participatory action research for sustainability of rain-fed lowland rice-based system of Northeast Thailand
Project Duration using Grant Funds (in month)	24 months
Countries of Implementation	Thailand

## III. Primary CGIAR Center Partner

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## IV. Other Partners

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Type of Organization	NGO
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## V. Other Partners

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# I. Project Description

## 1. Project Title

### **Linking Thai Jasmine Rice farmers with markets using participatory action research for sustainability of rain-fed lowland rice-based system of Northeast Thailand**

## 2. Problem Definition

Amongst the four regions of Thailand, Northeast Thailand has the most land devoted to agriculture (9.25 million hectares) and the greatest number of farms (2,273,000) (Office of Agricultural Economics, 1998). However, income per capita for the region is less than 40% of the national average and the incidence of poverty is at a relatively high level effecting 37% of the population (Matsuo, 2002). More than 80% of the population is engaged in agriculture, of which the dominant form is rainfed. The region is considered an integral component in agricultural food production with rice production being undertaken on 70% of the arable land in the region. Apart from the constraints of small farm size, the region is dominated by low fertility soils (sandy soil, extremely poor water holding capacity and subject to erosional degradation), lack of irrigation infrastructure (Anon. 2007a), inadequate water management techniques, flash floods and droughts (Kabaki, et al., 2003; Kupkanchanakul, 2005) and a lack of location-specific technologies to address these constraints. Whilst the predominant form of rice production is rainfed, poor soil fertility and low nutrient inputs are considered to be the major limiting factors affecting low rice yields (Wijnhoud, 2007). As a means of addressing the constraints of water and poor soil fertility, several farmers have adopted alternative approaches such as Integrated crop management (ICM), Integrated Production and Pest Management (IPPM) and System of Rice Intensification (SRI) which encourages holistic and synergistic way of crop management.. However, enhancing the fertility of soils and optimal water use for sustainable rice production require better understanding of soil-plant-water relationship and so the better skill to manage it. Farmers will appreciate these soil-plant-water relationships only when they understand the dynamics of it.

Given the location-specific nature of these crop management principles, farmers are better placed to adapt and adopt these crop management practices using a participatory approach for higher and sustainable rice production (Mishra et al., 2006). Apart from poor soil fertility and water management another major limitations to farmers of Northeast Thailand in rice farming are the weed problem. To address these challenges, farmers recently established experiments to evaluate intercropping rice with different species of green manure using first as a cover crop to suppress the weed and later as a green manure to increase the soil fertility status. This represented an innovative action research approach by farmers of this region which has reduced weed pressure, increased water use efficiency and enhanced soil organic matter. Farmers evaluated this innovative crop management practices and adapted them to meet local circumstance using the Farmer Field School (FFS) methodology. They were assisted by the Asian Institute of Technology (AIT), and ThaiEd Foundation, with funding support from Challenge Program for Water and Food (Grant number 504), CGIAR. The first season of action research was highly successful. It resulted in reduce weed competition, addressed pest problems, improved water usage, and enhanced soil organic matter. The result of these interventions were increased rice productivity and improved profitability which was presented and discussed by the farmers at an International Forum on Water and Food (12-17 November 2006 at Vientiane, Lao PDR) (Anon. 2007 b)

Recent studies undertaken in Northeast Thailand to assess the efficacy of a range of soil interventions to enhance the fertility of rainfed light textured sandy soil have demonstrated the positive impact of additions of locally sourced bentonite on upland forage sorghum yields (Noble et al., 2004). Research undertaken with organic rice farmers in Northeast Thailand, rates of bentonite between 0.6 – 9.6 t ha<sup>-1</sup> in combination with their normal compost/manure applications have yielded considerable increases in organic paddy rice production as well as profits clearly indicating that this approach to remediating soil constraints has considerable. The reasons for the substantial increases in production are due to the ability of the added clay to increase soils ability to retain and supply plant essential nutrients, along with a measurable increases in the soil water holding capacity (Suzuki *et al.*, 2005; Noble et al., 2005).

With the expanding success of these local initiatives at the community level, farmers are now increasingly willing to adapt/adopt improved crop management principles for Jasmine rice in the northeast region, which is the original home of Thai Jasmine rice (Anon. 2007c). There is growing market demand for Jasmine rice both nationally and internationally that has developed in a sustainable manner. However, productivity of Jasmine rice is very low compared to other rice varieties. Furthermore, farmers cite additional significant risk factors that include pests and diseases and poor soils as factors influencing productivity (Wall, 2006). This proposal aims to integrate, evaluate and upscale the initial learning derived from the introduction of rice + green mulch and soil amendment techniques. In addition, the project will assist farming communities/NGO develop an innovative multi-stakeholder model – involving traders, millers, researchers, government and nongovernmental organizations – that enhances profitability and income security of Jasmine rice farmers in Northeast Thailand that is ecologically sustainable.

### 3. Project Rationale and Objectives

*Describe the overall project rationale and list the project objectives. Please also describe the relevance of project partnership in achieving objectives*

The project rationale stems from the problem definition outlined above. Moreover, rice farmers of Northeast Thailand are facing serious challenges due to rapid deforestation; erratic rainfall patterns and unbalanced farming systems that have prevailed over the past several decades (Bridges et al, 2001). These changes have directly affected the overall livelihoods for millions of smallholder rice farmers that are afflicted by this vicious cycle of chronic low productivity. By addressing soil constraints along with the adoption of more ecologically sustainable farming principles it is argued that this will significantly reduce vulnerability to climate variability as well as increase productivity.

Enhancement of food and income sustainability in the context of climate variability and within socially vulnerable smallholder rice grower communities of NE Thailand is the main focus of this project. This will be addressed through building upon an ongoing (Challenge Program for Water and Food funded small grant 504) successful project. The project will develop location-specific technologies and approaches with groups of farmers on aspects of water productivity by optimizing agronomic practices, the incorporation of an intercropped green mulch crops (i.e. Mung Bean) and the implementation of soil rejuvenation approaches in a participatory action research model. Food and income sustainability is a complex issue that requires addressing persistent production problems such as land degradation and declining water resources but also needs to investigate ways of incorporating potential export oriented rice varieties such as Jasmine thereby enhancing income generation at the household level. In order to achieve this, a multi-stakeholder action research pathway with a democratic and participatory ethos that includes the entire community of rice growers is required for the positive effects to impact individual households. The proposed project envisage that a forward linkage to markets and at the same time a backward linkage to research institutions of national and/or international would immensely benefit farmers and participating partners in the long-term.

The overall objective of the project is to increase the productivity of Jasmine rice production systems that will lead to enhanced incomes and poverty alleviation in Northeast Thailand. This will be achieved through the following specific objectives:

1. Evaluate the potential role of green mulches in combination with clay and organic amendments to soils as a means of enhancing the fertility and water holding capacity of degraded sandy soils;
2. Evaluate the impact of these interventions on soil fertility status, water holding capacity and microbial diversity and its subsequent effect on rice plant productivity;
3. Develop training materials based on the result of PAR along with systems of forward and backward linkages for sustainability of the process and benefits to rice farming community;
4. Build capacity of participants in understanding the process of problem sensing, trial development and setting, evaluating and modifying action research to enhance the water, rice and soil productivity for Thai Jasmine rice;
5. Incorporate technological and quality issues into the action research and training process in order to provide stronger linkages between Thai Jasmine rice farmers and the market that will facilitate meeting national and export market demands.

This proposal would be a new phase of an ongoing project that focused on a bottom-up approach - from the problem definition and gaining consensus to dissemination of solutions and formulation of related policy imperatives by bringing all stakeholders to a common platform involved either at local, regional, national or international level. AIT, being a regional hub for post-graduate studies in the region, is currently undertaking cutting-edge rice science research which would directly contribute to the project along with its commitment to bringing knowledge of sustainable water use technologies and experience from over 5 decades of working in the Mekong region. Further, AIT and its local partner, ThaiEd, have over the past 10 years worked with farmers in Thailand and countries in the Mekong basin on enhancing livelihoods and addressing poverty and these experiences would strongly contribute to the success of the proposed project. We believe that association and knowledge exchange with ThaiED would assist ThaiED to strengthen its scientific capability that would have beneficial impacts on the organizations continued work within the region. In addition, a partnership of AIT-ThaiEd with IWMI (CGIAR), would greatly strengthen the vast array of technological expertise in water productivity aspects and practical approaches to improve the productivity of degraded soils (use of bentonite), would assist the project achieve its ambitious goals in gaining a wider and more sustainable impact.

### 4. Project Implementation with timeline

Describe (i) the methodology and (ii) list the key proposed project **activities** (including roles of partners), and planned **outputs/deliverable/milestones**, including the **timeline** for delivering these outputs.

As stated above, Asian Institute of technology (AIT, details at [www.ait.ac.th](http://www.ait.ac.th)) and its NGO partner, Thai-Education Foundation (TEF, details at [www.thaied.info](http://www.thaied.info)) is currently running a CPWF small grant project. The objective was to increase water use efficiency of rice in NE Thailand. The project successfully mobilized stakeholders' from the Governor to district-level functionaries of the government. It also engaged non-government organizations leading to the successful increase in rice yield with less external input use, especially water. The project is in its second season of action research using the innovative research-community-farmers platform (January – July 2007). The project has so far trained 30 farmers (extending to around 200 through field day and mid-season workshops) for season-long studies on water and biodiversity, using an innovative rice growth development curriculum. An additional 60 farmers are being trained through funding from the FAO regional IPM program to the partner NGO, ThaiEd. In addition, 10 field trainers from the Department of Non-formal education were trained in the methodology and technical contents of the project.

The first project cycle evaluated the concept of increasing water productivity and sustainable production of locally preferred traditional/glutinous rice varieties to improve food security. The proposed second cycle seeks to go beyond food security to income security by working on internationally-preferred Thai Jasmine rice which has considerable export potential and to introduce innovative approaches to enhancing soil fertility. The proposed cycle of work also aims to develop a sustainable consortium between farmers, traders, government and NGOs to work as a focal point for a proposed research-extension-trade partnership. This could serve as model with national and regional significance.

The following activities will be undertaken to achieve the stated objectives:

1. Development of innovative action research platform by active advocacy involving farmers, traders, research and development community (*a first step in this direction was made on 13-15 June 2007, when all stakeholders of the ongoing project met and agreed on the overall objective of this proposal (see annex -1) (Similarly, a detail discussion was held with the CGIAR partner Dr. Andrew Noble in Bangkok)*;
2. Participatory problem analysis on the current status of the Jasmine rice production (from crop production and protection, post harvest, quality, access to local and export markets along with policy implications) from strategically selected areas using direct baseline surveys, secondary information source, empirical experience coupled with SWOT analysis to assess priorities and achievable problem solving;
3. Workshop to seek the best available solution (under the framework of Good Agriculture Practices, GAP) from the research communities on these various aspects and development of study designs (field study, market chain study etc.) so as to enable farmers and traders to produce GAP standard produce for in-country and export-oriented Jasmine rice;
4. Implementation of PAR (participatory action research) field studies;
5. Second-season project implementation and repetition of the evaluations to generate local specific technology and GAP standards;
6. Two season of concurrent training to farmer groups using FFS (Farmers Field Schools) methodology of non-formal adult education based on site training and linking the producer to the local traders and rice mills to the market;
7. Participatory project evaluations both during and at the end of the project involving all stakeholders of the consortium;
8. Curriculum development workshop to assemble and finalize local specific training curricula
9. Collection, analysis of all information, field data and presentation of the key results to the key policy makers at regional and national level. Presentation of key findings to students from the various countries in AIT for further dissemination of the results and methodologies.

**Table 1: Detail project activities with time line**

<i>Sl.</i>	<i>Activities</i>	<i>Partners</i>	<i>outputs/deliverable/milestones</i>	<i>Time line</i>
1	<b>Preparatory phase Project inception and planning workshop</b>	AIT – TEF All <sup>1</sup>	<b>Project inception and planning report (Deliverable) Development of innovative action research platform (Milestone) Farmer and village selection (Outputs)</b>	<b>Preparatory time: Nov. 07 – Jan. 08 Workshop: Jan 08</b>
2	<b>Participatory problem census and analysis of current status of the Jasmine rice production system (JRPS) from strategically selected areas using direct baseline surveys, secondary information source etc.</b>	AIT- TEF	<b>Report on Current Status of Problem and Opportunities for smallholder jasmine rice producers in NE Thailand (Deliverable) Crop Calendars, list of problems with jasmine rice production and market (Output) Fine tuning of research objectives (milestone)</b>	<b>Feb – May 08 Reporting June 08</b>
2 a	Detail literature review on current status of the Jasmine rice production in NE Thailand vis-à-vis production, protection, export etc.	AIT		Jan - April
2 b	Baseline survey and development of cropping calendar	AIT- TEF		Feb-April
2 c	Analysis of baseline data and problem identification	AIT		May 08
3	<b>Workshop to identify Good Agriculture Practices (GAP), available solutions and formulation of detail experimental design using experiences from previous project cycle and from IWMI and other research institutions.</b>	ALL	<b>Details of first season action research (D) Initial Identification of GAP (Output) Development of Experimental design for the first season field experiments (Milestone)</b>	<b>June 08</b>
4	<b>Setting up of first season action research in select village in the NE Thailand using Farmers Field School approach</b>	AIT- TEF	<b>Pre and post action research farmers evaluation ; Crop growth and development data; Evaluation of soil characteristics vis-à-vis soil fertility before and after intervention (Output) Setting up of Farmer's Field Schools (FFS) ; Mid- season evaluation (Milestone)</b>	<b>July- December 2008</b>
4 a	Soil testing for CEC (Cation Exchange Capacity),soil organic matter, water holding capacity, total NPK content, soil microbial diversity etc. twice, first before transplanting and second, after harvesting	AIT		July 08 Dec. 08
4 b	Pre-action research farmers evaluation using ballot box test for FFS farmers	AIT- TEF		July 08
4 c	Data collection	AIT- TEF		July – Dec. 08
4 d	Mid-season PAR workshop and Evaluation	AIT- TEF		Oct. 08
4 e	Post farmers evaluation using ballot box test for FFS farmers	AIT- TEF		

<sup>1</sup> Including IWMI (CGIAR project partner), TEF (local project partner), millers, traders, local government and nongovernmental research and extension agencies

4f	End of first season's experiment (field day to evaluate and share results with farming community)	AIT-TEF		Dec.08
5	<b>Data analysis and stakeholder workshops; planning for the second season</b>	All	<b>Report of first season's action research (Deliverable) Preparation of second season's action research (output) Fine tuning of action research objective and GAP practices based on the first season's result (milestone)</b>	<b>February 2009</b>
6	<b>Setting up of second season action research using FFS approach</b>	AIT-TEF	<b>Pre and post action research farmers evaluation ; Crop growth and development data; Evaluation of soil characteristics vis-à-vis soil fertility before and after intervention (Output) Setting up of Farmer's Field Schools (FFS) involving additional farmers ; Mid-season evaluation (Milestone)</b>	<b>March 09 – Oct. 09</b>
6a	Pre action research farmers evaluation using ballot box test for FFS farmers	AIT-TEF		
6b	Data collection	AIT-TEF		
6c	Mid-season PAR workshop and Evaluation	AIT-TEF		
6d	Post farmers evaluation using ballot box test for FFS farmers	AIT-TEF		
6e	End of second season experiment (field day to evaluate and share results with farming community)	AIT-TEF		
6f	Soil testing for CEC (Cation Exchange Capacity), Soil Organic matter, water holding capacity, Total NPK content , soil microbial diversity etc. after final harvesting	AIT-TEF		
7	<b>Final data analysis (field data, soil data and experiences from partners like millers and traders) and stakeholder workshop to discuss findings and development of GAP</b>	All	<b>Functional community owned multi stakeholder partnership for Thai Jasmine rice (Milestone) GAP for export Jasmine Rice smallholder production in NE Thailand (output) Results of second seasons action research and stakeholders workshop (deliverable)</b>	<b>Nov. 09</b>
8	<b>Curriculum Development workshop on the development of non-formal education based training curricula and guide for Export Jasmine Rice smallholder production in NE Thailand</b>	AIT-TEF	<b>Weekly curricula for the Farmers Field School on export Jasmine rice production for NE Thailand; Training design and session guides (output)</b>	<b>August-Sept 09</b>
9	<b>End Project policy workshop</b>	All	<b>Final Project Report (D)</b>	<b>Early Oct. 09</b>
10	<b>Preparation of manuscripts to create International public goods on the project outcomes</b>	All	<b>Manuscript to seek publication</b>	<b>After October 09 -</b>

## 5. Project Results and Impact

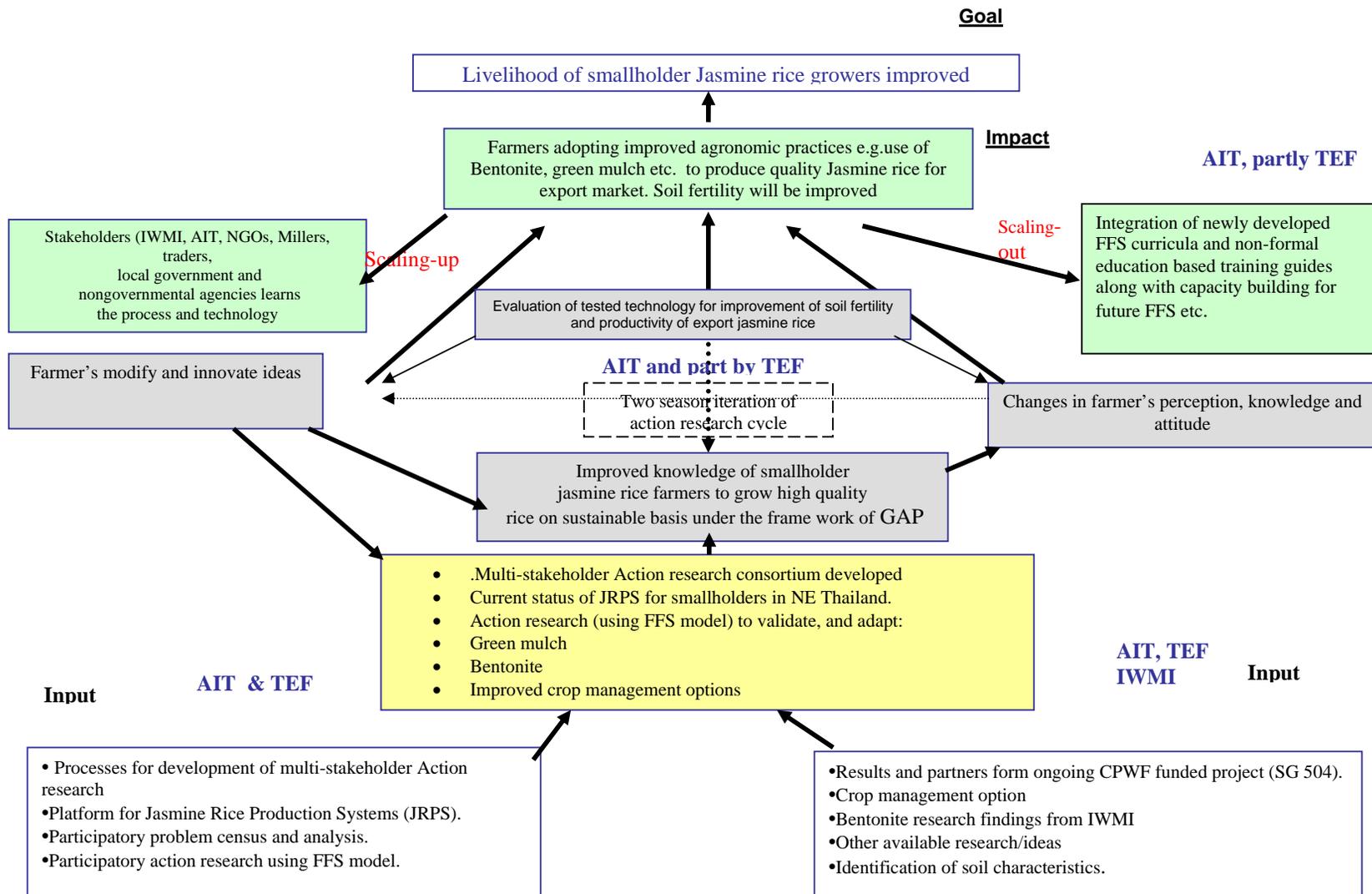
### 5.1 Description of Intended Impact Pathway

*Describe the intended impact pathway from project outputs through outcomes to the ultimate impacts that are expected to result from the project. Please describe the causal linkages between Input -> Output -> Outcome -> Impact, and the role of the partners at different stages in this pathway.*

Fig 1 (see page 8) shows the intended impact pathway of the project defining inputs from the AIT (Asian Institute of Technology), IWMI (International Water Management Institute), and TEF (Thai Education Foundation). Please note the expected output (yellow shaded box), outcomes (grey shaded boxes) and impacts (green shaded box) from the work and their possible scaling up and scaling out schemes as designed as a part of the project

**Role of partners:** The planned role of partners is indicated in the Figure 1(page 8). In general, AIT would take a lead role in establishment, management and reporting along with IWMI and TEF. The local NGO partner, ThaiED will help in execution of the project at the field level. IWMI will bring in its experiences of working with Bentonite and other appropriate technologies to the research consortium and will act as a guide to the process, participating at all crucial steps as outlined in the Table 1.

**Fig 1: The intended impact pathway of project:**



## 5.2 Project Results Framework

Please build a results framework for the proposed project complementing the **planned outputs**, with clear definitions of expected **outcomes** from the project, i.e. the external use, adoption, or influence of the projects output(s). Also define **outcome indicator** that help to assess the progress of the project against the stated outcome. Outcome indicators should be clear, relevant, adequate and monitorable to your project.

<b>Output</b> (including planned date for delivering output)	<b>Outcome</b>	<b>Outcome indicator</b>	<b>Baseline</b> (for outcome indicator at the start of the project)	<b>Target</b> (for outcome indicator)
Selection of study sites and farmers; development and strengthening of local research consortium; project inception report / January 08	Working consortium developed	Project inception report with details of consortium, location, farmers etc.	In 2007, no consortium existed	By 2009, functional consortium exists
Participatory problem census and analysis of current status of the Jasmine rice production system and GAP and development of field experimentation details, /June 08	Details of first season of field experiments plans developed and agreed upon by all parties.	Report on current status of Jasmine rice production – challenges and opportunities; crop calendar; marketing aspects; Initial identification of GAP indicators	In 2007, no detailed information on Jasmine rice and GAP standard exists for smallholder export Jasmine rice of NE Thailand.	By 2009, farmers will be aware about the GAP for Jasmine rice
Setting of first season PAR; farmers evaluation; project evaluation and end of season workshop to evaluate the outcome/ February 09	Results of first season action research reported.	Report on the first season of PAR; farmers field schools; number of farmers trained; number of farmers exposed to the action research; cost-benefit analysis; linkage to market developed	-do- In 2007, little capacity among local partners in problem census, analysis and action research development, execution, analysis and interpretation	-do- By 2009, local consortium and partners develop capacity to run action research, able to link major problems to national, international research centers. Understand and uses participatory tools and techniques
Setting of second iteration of action research; training of more farmers using FFS; exposure to more farmers using mid-season and field day/ July 09	Results of second season of action research reported.	Report of second season of action research; farmers field school curricula developed; no. of farmers trained, exposed; linkage to market developed in better way	-do- In 2007, no technology/ide as available on increasing rice productivity	-do- By 2009, two season results will be available and used by farmers to increase rice productivity; increase soil fertility, better conserve water and increase profitability
Curriculum development workshop / Sept. 09	Curriculum developed for GAP standard for smallholder rice producers	Detail curricula and non-formal based training guide available for scaling out; local	In 2007, no curricula and training guides available using non-formal	By 2009, a detail weekly curricula along with details of session guides will be available for scaling out

	using FFS approach for further scaling out	consortia of farmers, researchers, NGOs, GOs developed liking production to market; number of peoples trained to take up the ideas to more farmers in the locality	education methods on GAP standard for Jasmine rice in NE Thailand	
End of project workshop	Results of project shared with students, NGOs, policy makers; better idea on links with CGIAR center and CSO developed	International public goods in form of manuscript developed on learning from the project; better links with CGIAR system and CSO such as AIT developed; number of policy makers from national and other level briefed; number of students from Asian countries exposed to the project	In 2007, smallholders Jasmine rice growers are marginally addressed in national and local policy sphere	By 2009, the strong case of action research and its advantage through development of local peer group and research outcome will help to draw the case of smallholder's rice farmers to the policy makers.

## 6. Project Partnership: Innovation, Roles, Responsibilities and overall organizational sustainability

*Please describe the (i) roles and responsibilities of each partnership organization in achieving the project outcomes, (ii) how the partnership embraces principles of joint decision-making, inclusiveness, mutual learning and knowledge-sharing, (iii) and how an organizational sustainability of this partnership is envisaged.*

AIT and its local partner, ThaiEd, would contribute from their wide ranging experiences of working in Thailand. Notably, the ongoing work on water productivity using SRI elements in the NE Thailand would directly contribute to the project's understanding and day to day functioning at the ground level. In addition, a partnership of AIT-ThaiEd with IWMI (CGIAR) would help the project achieve its ambitious goals and assist in gaining a wider and more sustainable impact. IWMI has undertaken considerable research into enhancing water use efficiencies in upland cropping systems through addressing soil constraints in Northeast Thailand with concomitant increases in productivity and income generation. These approaches that include the incorporation of clay (bentonite) based materials have not been assessed within the context of SRI and offers a potential opportunity for rice farmers to increase the productivity. The complementarities of each of the partners and their roles are summarized in the Table below.

The project design is based on participatory ethos thereby ensuring inclusiveness of all partners at every stage of project as outlined in table 1. Mutual learning and knowledge sharing are part and parcel of this proposal through a series of workshops, meetings etc. These close interactions at every project stage will help to arrive at joint decisions and ensure timely exchanges towards meeting set objectives.

Partner	Role
AIT	Project management, provide technical support on rice and its experiences to the overall project, host the project, policy workshop, reporting etc.
IWMI	Share Bentonite based technology, experimental design, expertise in soil chemistry and soil moisture determination, assist in data interpretation, and reporting.
TEF	Assist AIT in organizing the farmer's field school, local organizational support at project site; local field day and workshops. In later part, TEF will be the knowledge host for the

	other local and regional NGOs and GOs in Mekong area for scaling out
Others	SRI researcher Abha Mishra from AIT will support the development and implementation of the field trials, data monitoring and other need based support

Until now AIT (regional institute with a mandate of post graduate research and training) with its time-tested and multi-dimensional relationship with the governments and non government organization in this region is poorly linked to the CGIAR centers like IWMI. The proposed complementary partnership will have long term benefits to the institutions and peoples in the region. In addition, it could open up a potential mutually beneficial chain of events in times to come directly contributing to the shared goals of prosperity through use of good science.

Moreover, as the project inputs would assist in initial development of multi-stakeholder local platform comprising of farming, research, business and NGOs/CBOs communities under one roof; it is envisaged that this group will act as a local sustainable group catering, nurturing local issues and eventually developing into a peer group to add to overall policy direction of local government and its policies. Thus winning combinations of business, research and policy interest are at core idea of this project proposal and that would be achieved through participatory ownership and execution of the project.

## 7. Proposed Budget

Item	Grant request	Co-Financing/funding (in Kinds)
Personnel	88,000.00	25000
Research supplies and services	10,000.00	40000
Equipment	10,000.00	25,000
Training and other knowledge-sharing activities	79,000.00	
Travel	25,000.00	
Communication	7,000.00	
General Administrative Expenses	24,000.00	20,000
<b>TOTAL Project Cost</b>	<b>243,000.00</b>	<b>110,000.00</b>

Please provide details on other co-financing and funding sources:

In kind co-funding will be made available by AIT in form of faculty timing, providing office space etc. AIT will also host workshops and will allow using its extensive laboratory, and fielding facility to the project on institutional rates.

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**Annex 1:** Discussion meeting on project objectives and ideas, Roi-Et, NE Thailand 13-15 June 2007; participated by farmers, local officials and NGO partner (coincided with the evaluation of the ongoing project SG 504)

