Cambodian Agricultural Research Fund (CARF)
Projects

Round 7

Project ID: CARDI 206 - Participatory Selection of Waxy maize Cultivars for Cambodian Farmers

Lead Organization: Cambodian Agricultural Research and Development Institute (CARDI)

Project Leader:

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Collaborating Institutions:

- Provincial Department of Agriculture, Kampong Thom
- Research Station in Kampong Cham, GDA
- Department of Industrial Crops – GDA
- Prek Leap National School of Agriculture
- CARDI – Socio Economic Division

Project Budget: USD$ 29,972

Project Duration: June 2009 – June 2012

Project Overview:

Waxy maize is considered as the important traditional crop of Cambodia. It provides good quality taste for human consumption and serves as the source of extra income for the farmers in this country. It is grown almost through-out the country including Kampot, Kampong Thom and Takeo. However, waxy maize gave very low yield due to inbreeding depression and lack of variety improvement that led to being substituted with the imported high yielding varieties (non-waxy and yellow maize). Therefore, waxy maize in Cambodia is under endangered situation and farmers' incomes are very low according to low yield. For this reason, the Cambodian Agricultural Research and Development Institute (CARDI) wishes to propose a research project to address such problems. Ultimately, we expect our new varieties will enable farmers (rice-based and non-rice based) to improve and diversify their income from waxy maize production. This conforms to the Government strategy in poverty alleviation and CAVAC's guidelines for CARF projects. Even though farmers in CAVAC's provinces are mostly rice farmers but they also grow non-rice crops including waxy maize as source of incomes. Thus, this project will be really helpful to them in generating more incomes.

The proposed project will be implemented over a period of three-year from July 2009 to June 2012 by Plant Breeding Office of CARDI in collaboration with Department of Industrial Crops under General Directorate of Agriculture, Prek Leap National School of Agriculture and Kampong Thom Provincial Departments of Agriculture in the form of assistance in the project implementation. The project cost is USD 29,971.99. The proposed project, building on existing material from Rock-VN project, attempts to identify waxy maize cultivars which are high yielding and have required quality traits. Through this project fifty farmers will be interviewed in the first year to assess pre-condition for crop change and importance of waxy maize in income generation and 18 waxy maize lines of CARDI will be evaluated for broad adaptation and farmers and consumers' preference by using participatory approaches. The evaluation will be preliminarily conducted in CARDI, Kampong Thom, Kandal and Kampong Cham for adaptation to different environment with a PVS for each trial. After that, the most promising lines will be further evaluated as well as disseminated to other farmers through on-farm adaptive trial (OFAT) in Kandal and Kampong Thom, the main waxy maize production areas.

The pre-released varieties will be multiplied for seeds; a research paper will be prepared for publishing in CJA for the use in research purposes; and brochures describing varieties, agronomic practices and variety purification methods will be published for extension purposes.

After the project finishes, the seed production (breeder seed) will be conducted by CARDI. For other classes of seeds, CARDI will produce on demand. Alternatively, growers themselves can produce their own seeds based on provided CARDI's guideline or CAVAC can push other relevant agencies to establish a seed company to guarantee sustainable seed supply chain system. We anticipate that the proposed project will broadly benefit farmers, researchers, policy makers, scientists and other people as a whole.

Project ID: CARDI 211 - Enhancement of Farmers' knowledge and skill of pest management on Tomato crops in Cambodian

Lead Organization: Cambodian Agricultural Research and Development Institute (CARDI)

Project Leader:

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Collaborating Institutions:

- Agronomy and Farming Systems Division, CARDI
- Socio-economic Division, CARDI
- Provincial Department of Agriculture, Kampong Thom
- Charles Sturt University, Australia

Project Budget: USD$ 24,633

Project Duration: January 2009 - January 2012

Project Overview:

Rice is the major crop providing stable food security and income for the population. However, secondary crops such as vegetables play an important role to increase income to Cambodia population. Tomato is one such crop to target. However, tomato crops are often damaged from pest from start of growing to harvesting stage. To control this, farmers have relied heavily on pesticides. In general, the pesticides have been used improperly, the result of which are populations of pests that are pesticide resistance, the occurrence of secondary pest outbreak and unwanted death of beneficial insects. In addition, improper use of pesticides has impacts on human health and environment. Thus, to resolve these constrains are better and better:

The first phase of this project, during the first thirteen months, will aim to collect basic information about growers' perception or knowledge of the cropping system, cultural practices with emphasis on pest management in tomato crop, and the attitude farmers toward pesticide use. The survey also aims to identify the major pests that constrain tomato crop production in Cambodia.

The objective of the second phase of the project, during the second year, will be to design and conduct experiments of pest management at CARDI's field in order to determine pest management technology with effective and low economic costs, with an emphasis towards practices safe for human health and environment. Alternative practices include the promotion of simple organic pesticides and IPM practices. Furthermore, this project will contribute to the protection of our environment and human health through minimizing residues and promoting safe and effective organic pesticide use on the farm.

The third phase of the project, for eleven months, will conduct field demonstration on growers' farms by comparing the most effective of organic pesticides and IPM technologies done experiment at CARDI's field with a general growers' practice. The field demonstration will be collaborated with extension worker at Kampong Thom province.

The project will costs US $ **24,633.4** (Twenty four thousand six hundred thirty three dot four US dollar) and will have a duration of three years.

The improvement of tomato production and alleviation of pest constraints will increase the value of the commodity and assist in improving smallholder incomes in whole production areas. This is a key goal in the

recently established CAVAC program. In addition, this proposal will address several of the aims of CAVAC by:

- Addressing pest constraints in tomato production value chains
- Provide publication materials allowing the transfer of improved pest management technologies and information to extension workers, researchers, students, especially to farmers
- Link researchers, extensionists, and farmers through farmer surveys and field demonstration sites.

Drs Ben Stodart and Gavin Ash, Charles Sturt University, will provide advice and assistance in experimental design, and the analysis and interpretation of results. In addition, advice on the production of research publications will be provided.

Project ID: CARDI 222 - Increasing banana production in Cambodia through tissue culture

Lead Organization: Cambodian Agricultural Research and Development Institute (CARDI)

Project Leader:

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Collaborating Institutions:

- International Network for Improvement of Banana and Plantain (INIBAP), Philippines

Project Budget: USD$ 21,000

Project Duration: January 2010 – December 2012

Project Overview:

Bananas and plantains (*Musa* spp.L.) are giant perennial herbs that thrive in the humid and subhumid tropics. They evolved from intra- and inter-specific hybrids of the two diploid wild species *Musa acuminate* Colla. and *Musa balbisiana* Colla. in the EuMusa series of the genus *Musa* (Simmonds and Shepherd, 1955; Simmonds, 1995). Banana fruit provides one of the major commodities in international trade, but they far more important as a starchy staple in local food consumption.

Traditionally, farmers grow banana by using sword suckers. By this way, multiplication for the next generation is very low (1-2 suckers can be multiplied from each mother plant during the year) and it easily transmits diseases from generation to generation. Both constraints issues in world's banana production and also in Cambodia. The common banana's disease in Cambodia reported by Preap Visarto et al., (2006) and Chea Sareth (2008) in fusarium wilt (*Fusarium oxysporum* Schlecht.), but there is no information yet about its effect.

Coping with these constraints, researchers came up with rapid clonal propagation of any plant part on nutrient medium called plant tissue culture. In the early 1970s, Ma and Shii (1972) reported first banana plants produced by shoot-tip culture in Taiwan and then Berg and Bustamante (1974). However, large-scale field establishment of micropropagated plants of banana has been first reported by Hwang et al. (1984) in Taiwan and then rapidly wide- spread across the world. Tissue culture is not only used for safe multiplication of banana but also for conservation genetic resources of banana.

In response to the above problem, CARDI wishes to propose a research projected named ***Increasing banana production in Cambodia through tissue culture*** which will contribute to glorify banana production by having main objective of increase farmer's income by growing high yield and diseases-free varieties.

A total of 2 sets of experiment involving one variety (Chek Pong Moan) with two treatments. One treatment is banana plantlets from tissue culture and other is banana conventional suckers. The experiment will be conducted under farmer's field management in Kampot provinces in dry and wet seasons over the period of 3 years started from January 2010 to January 2012 under responsibility of Plant Breeding Division of CARDI in collaboration with Provincial Department of Agriculture (PDA) of targeted areas. The project will cost totally **21,000USD**. This project will be contributing to the processes of technology transfer and adoption by stimulating the utilization of previous research technology.

Project ID: CEDAC-205 - Study on rice market chain in Takeo and Kompot Provinces

Lead Organization: Cambodian Center for Study and Development in Agriculture (CEDAC)

Project Leader:

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Collaborating Institutions:

- Provincial Department of Agriculture, Takeo
- Provincial Department of Agriculture, Kompot
- Prek Leap National School of Agriculture

Project Budget: USD$ 10,000

Project Duration: July 2009 – December 2009

Project Overview:

About 80 percent of the 14 million Cambodia population is rural, and mostly they are rice farmers. There are around 1.8 mill rice farming households, and the majority of them are subsistence rice farmers with land holding less than 1 ha per family.

The research entitled-above will be conducted in purpose of studying precisely the situation of rice market chain in Takeo and Kompot provinces especially to study in detail about the demand of rice per annum, to assess the capacity of local farmers in producing rice for market supply, to conduct the price trend analysis throughout the year especially to find out the value addition of rice across the different market actors. Additionally, SWOT analysis for each market chain actor will be conducted. Currently, there are 2 community based rice mills set up under CEDAC's program, so this research will study also about the impact of community based rice mills to the price of rice and how it provides advantages to the rice producers. Furthermore, the financial flow analysis in term of rice product in the studied villages will be conducted as well and it intends to find out the appropriate solutions and marketing strategies for enhancing and empowering farmers' role in the whole process of rice market chain.

As mentioned above, this proposed research project will last for 6 months from July to December 2009. The study team will be formed with participation of CEDAC's staff, staff of agriculture offices of each studied district, and students from National School of Agriculture Prek Leap.

The participatory market chain approach will be used to ensure a good active participation from farmers and local authorities in the studied villages. The completion report as well as cases-studied produced by this proposed project will be written in both, Khmer and English version, in order to ensure highly dissemination of the finding results. The research team will circulate all those reports to community farmers, local authorities and government line departments in the studied districts through organizing technical workshops to present the finding results. To ensure a massive dissemination, those documents will be also published via CEDAC's media such as Farmer Magazine and website and other journals which are relevant to this research project. In short, it is to emphasize that the community farmers, local authorities and government officials, students from agriculture school, will be able to access the information and get the benefit from this research project.

Project ID: GDA 212 - Study of seed method and seed rate for direct seeded irrigated rice

Lead Organization: Department of Rice Crop, General Directorate of Agriculture (GDA)

Project Leader:

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Collaborating Institutions:

- Cambodian Agriculture Research and development Institute (CARDI)
- Provincial Department of Agriculture, Takeo
- Provincial Department of Agriculture, Kampong Thom

Project Budget: USD$ 29,815

Project Duration: June 2009 – June 2012

Project Overview:

In Cambodia, there are two rice cultivation seasons, dry and wet seasons. Wet season rice covers larger area (rainfed area) and dry season is grown in the flooded area (surrounding water reservoirs) and in some areas where irrigation systems have been well developed. When talking about dry season rice most people consider that it needs higher inputs but it also gives higher yield in comparison with wet season. In the past years most farmers have grown dry season rice by transplanting method but when the labor cost is getting higher and higher they have changed their practice to direct seeding, especially in the areas along Vietnamese border such as Prey Veng, Svay Rieng, and Takeo provinces. At present, this method has spread out to other dry season areas like Battambang, Pursat, Kompong Chhnang and Kompong Thum provinces. The seed rates used by farmer for direct seeded rice in the dry season has big variation ranging from 50 to 300kg/ha but most farmers use about 200-250 kg/ha with the reason that using higher rate will be able to control weeds and increase yield. This practice is higher rate than the recommended of CARDI only 70-80 kg/ha (Rice book, 2007). Whether the reasons raised by farmers true? and is it economically viable? Is there any other factor affected to rice yield and weeds management? Actually, water management, and land preparation have effected to weed growth. Whereas, soil fertility, fertilizer use, land preparation have effected to yield. In this research, it is focused only on seed rate but the other factors will be observed based on different agro ecosystem.
To reduce seeds rate of direct seeding rice, new technology (drum seeder) was innovated by IRRI and presently, being used and evaluated by researchers and farmers in many countries such as in India, Indonesia, Bangladesh, Philipines and Vietnam.

“The performance of the drum seeders is quite satisfactory and economically efficient,” says Dr. Tin Hla, national coordinator of the International Rice Research Institute’s (IRRI) office in Myanmar. The intensive demonstration of Vietnamese plastic drum seeders has been conducted with participating farmers. Based on the training workshop on Application of Participatory Approaches to Agricultural Research and Extension on 7-18 August 2006 at MSS Hall, IRRI, Training Center one conclusion was that plastic drum seeder technology is an excellent practice for direct seeding rice. “Compared with broadcasting, about 50–60% less rice seed is needed, there are very much savings in labor cost as compared to transplanting method. Moreover, these machines are easier to use in operations such as weed control, pest management, interrow cultivation by a push weeder, and harvesting.

This technology (drum seeder) is considered as an interested technique by Department of Rice Crop of Cambodia. If this alternative method was evaluated as the appropriate technique and adaptable by Cambodian farmers, the demonstration and promotion will be done widely for Cambodian farmers.

Nowadays, direct seeding of rice is being posted as an alternative planting method to answer scarcity of labor during peak periods. It requires well-leveled puddle soil surfaces, good water management during the first week

after seeding, and good weed control the latter often through the use of pre- or post-emergence herbicides offer a cost-effective alternative to laborious hand weeding afterward (farmers' practice). However, chemical control is knowledge-intensive, and overuse of herbicides may cause weeds to evolve resistance, damage the environment, and pose a risk to human health. So, manual weeding will became supplementary to chemical control.

The overall objective of the proposed project is to evaluate the effect of the different rates on yield and economics and to look for the optimum rate to be recommended to farmers for direct seeded rice. Moreover, some observation will be made also such as good land leveling for drum seeder, and weed control and the feeling of cooperation farmers and visitor. If observed that drum seeder is not adaptable by Cambodian farmers, in the third year will drop it and weed control methods will be more focused.

The project will conduct on-farm trials in collaboration with motivated district agricultural extension workers of provincial department of agriculture with participation from farmers in selected areas. Treatments to be evaluated are T1: Drum seeder (50kg/ha), T2: 50kg/ha,, T3: 100kg/ha, T4: 150kg/ha, T5: 200kg/ha, and T6: 250 kg/ha. Before promoting this technology widely in Cambodia, the Department of Rice crop wants to evaluate its effectiveness and efficiency first in this project. The rice variety will be used for this experiment is IR_{66}, the popular variety for dry season rice. The project will be implemented in large dry season province in Takeo and Kompong Thum provinces.

The beneficiaries will be Cambodian farmers, technical staff of the Department of Rice Crop, and district agricultural extension workers of Provincial Department of Agriculture who are working in the target areas and other relevant stakeholders. The conclusion of this project will be prepared for publication in Cambodian Journal of Agriculture and the relevant topics are probably identified for further researching.

The study will first be conducted on farmer fields of major dry season rice cultivation in Prey Kabas, Angkor Borei, Koh Andeth, Borey Chulasa, and Kirivong of Takeo province that covers approximately 7,0000 ha and in Staung, Steung Sen, Kampong Svay, Baray and Santouk districts of Kampong Thom province that covers approximately 2,0000 ha. To implement this research, the team will train the involved stakeholder to design experimental protocol, to discuss the implementation modality, management, and evaluations of the experimental results.

In the first year the project will study conduct one research per district and in the second year the project will repeat the field study to confirm the results. In the third year the project will conduct field demonstrations on farmer fields with farmers in the 2 target provinces.

The project expects to find optimum seed rate for direct seeded rice in dry season with reasonable yield and economic return to be recommended and disseminated farmers. This will lead to the reduced seed inputs as well as to increased production, economic viability and food supply for rural population

This three-year project (from June 2009 to June 2012) will require a total budget of US$ 29,815.00. The project will be implemented by a project coordinator who is a chief of Research and Development Office, the Department of Rice Crop, General Directorate of Agriculture. However, the project is going to work in close collaboration with Provincial Departments of Agriculture, district agricultural extension workers and farmers in the target provinces.

Project ID: GDA 223 - The Fruit Flies in Mango Management in Cambodia

Lead Organization: Department of Plant Protection Sanitary and Phytosanitary, GDA

Project Leader:

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Collaborating Institutions:

- Department of Rice Crop, GDA
- Provincial Department of Agriculture, Takeo
- Provincial Department of Agriculture, Kampot
- The National Plant Protection Department, Vietnam
- The Griffith School Environment, Australia
- Center for Management of Pest Fruit Flies(ICMPFF), Malaysia

Project Budget: USD$ 29,975

Project Duration: January 2009 – December 2012

Project Overview:

Fruit fly species (*Bactrocera spp*) are acknowledged to be the most destructive pest in mango (*Mangifera indica*) orchards in Cambodia. The adult females lay eggs in the green and maturing fruit; as the larvae mature they cause extensive damage by eating the fruit from the inside. Following an infestation by fruit fly larvae, the fruit becomes inedible and unfit for sale. Actual economic loss from fruit fly infestations in mango orchards in Cambodia has not been quantified. However it is known to be very significant. In addition to losses in mango sales on the domestic market, the presence of fruit fly inhibits access to export markets. With the development of an accurate data base these export restrictions can be overcome by compliance with international export agreements. The regulations for international export of agricultural produce are classified in the International Sanitary and Phytosanitary Measures agreement (ISPM agreement). These measures must be adhered to before export rights are granted. It has been recognised that access to the international markets for Cambodian agricultural produce would provide potential lucrative returns for Cambodian farmers and help reduce the levels of poverty in rural Cambodia.

The objectives of this project are to conduct field surveys including orchard monitoring and lure trapping and fruit sampling as well as farmer surveys, to determine what fruit fly species are present, their population densities and distribution, throughout the two worst fruit fly affected mango production provinces of Takeo and Kampot. Research conducted internationally on fruit fly management, in combination with local findings, will be drawn upon to assist with the determination of optimum methods for fruit fly control in Cambodian mango orchards. Economic thresholds for action will be determined during the management option trials. A number of management options will be assessed in both field station trials, as well as in trials conducted in farmer owned commercial orchards. Feedback of the project findings will be presented to farmers via a range of different delivery methods. Population monitoring as well as farmer surveys will continue, following implementation of the control measures. The database developed throughout the duration of this project will be maintained and additions made a part of pest data are acquired. As a vital tool, the database will enhance the capacity of educational and training programs for agricultural technicians and farmers in Cambodia, by providing reference specimens to assist in specimen identification, as well provide population data that will enhance their abilities to design appropriate control strategies, as well as predict pest population outbreaks.

Upon completion of the proposed CARF project, it is hoped that Cambodian mango farmers will gain sufficient knowledge and experience in environmentally friendly management of this insect pest and that they will then get the required regulatory approval for the export of mangoes on the international market. The research

findings will be published in appropriate journals, while the technical recommendations for control of fruit fly in mango will also be presented in appropriate extension manuals.

Similar projects to that being proposed for CARF-7 funding support have been carried out in both Vietnam and Papua New Guinea, with the application of the results then giving dramatic increases in economic profitability in the crops affected, providing a strong precedence for the relevance and impact potential of this proposed project.

This project is proposed as a three year project, to commence in January of 2010 and continue through until December 2012. The budget requirement for the three year period is US$29,975. This project will be implemented by Mr Mean Chetna, Officer of Plant Protection under the supervision of Mr. Heng Chhun Hy, Deputy Director of PPSPS in close collaboration with relevant national and international institutions who have good knowledge and experience in the area of fruit fly management. The collaborating institutions and personnel are listed in section 3.8 of this proposal.

Project ID: GDA 224 - Research for Best management of BPH in Cambodia

Lead Organization: Department of Plant Protection Sanitary and Phytosanitary, GDA

Project Leader:

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Collaborating Institutions:

- Department of Rice Crop, GDA
- Provincial Department of Agriculture, Takeo
- Provincial Department of Agriculture, Kampot
- International Rice Research Institute (IRRI), Philippine

Project Budget: USD$ 19,500

Project Duration: June 2009 – June 2012

Project Overview:

Brown planthopper become a problem in rice production system in Cambodia as it appears to outbreaks almost every year; especially in the provinces along the Vietnam border (Takeo, Kampot, Svay Rieng, Kandal and Prey Veng) in wet season and upper part of Tonle Sap lake (Kampong Thom province) in dry season rice crop. This potential constrain make the rice production scheme down as farmers abandoned the potential rice production area in fallow crop at dry season as they scare of BPH attack; for example at *Stoeung Chinith* irrigation scheme in Kampong Thom province. The expensive and harmful BPH control measures are the major concern by the Royal Government of Cambodia, which we need to find out the alternative options to deal with those destructive pest insect in Cambodia agro-ecosystem. We propose this project proposal to alleviate the shoulder load of the Government and farmers as well by introducing and testing the avoidance and escape strategic plan; planting date adjustment, tolerant variety, and safe manner (environment and health) of insecticide use will be tested and in this project. Farmers will be trained via learning by doing; farmers will participate in the experiment and they will learn from the activities. Alternative crops then rice, which are not BPH host, will also be tested to promote crop diversification for family extra income. The project will implement by project leader and his assistant with supervising by Dr. Preap Visarto, Acting Director of Plant Protection Sanitary and Phytosanitary Department and Dr. Haefele Stephan, IRRI expert as project mentors.

Project ID: GRET 215 - Research on Pest Identification and Management on Kampot pepper ("PIM-Pepper")
Identify the Harmful Insects and Diseases on Black pepper Plantation and Pest management

Lead Organization: Groupe de Recherche et d'échanges Technologiques, GRET

Project Leader:

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Collaborating Institutions:

- Department of Plant Protection, GDA
- Plant Protection Division, CARDI
- Pepper Promotion Association, Kampot
- Provincial Department of Agriculture, Kampong Trach District, Kampot

Project Budget: USD$ 7,000

Project Duration: June 2009 – June 2010

Project Overview:

Around 150families in Kampong Trach district have planted the black pepper from year 1998. Last year with the high black pepper price on the market, most of farmers take the initiative to extend their parcel surface and some farmers want to invest in this spicy production.

The information taken from the quick field survey showed the black pepper plantation was suffered by the serious affectation of insects and diseases and most of them were not identified properly by the farmers neither by the agricultural technicians of the district.

The proposed project are the objectives to

i) identify the major harmful insects and diseases of the black pepper in the study area,
ii) elaborate the field guide of crop protection for black pepper, including insects or diseases characteristics, damages symptoms, conditions favorable for pest development and pest management,
iii) follow-up the efficiency of the crop protection base on field guide recommendation,
iv) extend the field guide to the black pepper producers by organizing the short meeting discussion or training.

Year one, the proposed project will do the monitoring of the harmful insects and diseases of black pepper through the production cycle but mainly in the favorable appearing conditions to identify the insect species and the disease pathogens. This work will be jointed with the expert entomologist of the black pepper crop.
The desk study and exchange with the black pepper expert is needed in order to elaborate the black pepper crop protection field guide.
Year two, it will be the monitoring of the efficiency of the field guide used for crop protection and readjusting the weak points or inefficient recommendations for the field guide, then this field guide will be disseminated to other pepper producing provinces.
Year three, repeat the same action of year two and even year one (if appearing new species) and conform the efficiency of the field guide, then continue to do the extension to the black pepper producing provinces.

A booklet of recommendation will be published in year 2 to be used for dissemination purposes.
In addition, it is envisaged to submit an article to be issued in the Cambodian Journal of Agriculture, or in other relevant scientific publication.

Project ID: IDE 207 - A simple tool for improved on-farm irrigation scheduling

Lead Organization: International Development Enterprises, IDE

Project Leader:

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Collaborating Institutions:

- Cambodian Agricultural Research and Development Institute (CARDI)

Project Budget: USD$ 16,980

Project Duration: July 2009 – July 2011

Project Overview:

Limited water is one of the biggest constraints to improved agricultural production in Cambodia.
Significant investments have been made by multiple donors, in large scale water supply projects around the country. However, these schemes stop at the farm gate.
Little work has been performed on simple, on-farm , methods for water saving. There are currently no on-farm water management guides in Khmer. No previous work on irrigation scheduling (applying the right amount of water at the right time, accounting for crop type, stage, rooting depth, soil water holding capacity, and atmospheric conditions) has been performed in Cambodia. This work is important to enable Cambodian farmers to extract the most amount of value from their scarce sources, particularly in the dry season. Good scheduling practices also protect other agricultural inputs eg fertilizer, from leaving the crop root zone and entering other, unintended, systems such as ground and surface water.

Work is also important in this area to develop skills and tools that can be utilised in the CAVAC program, which has a strong focus on water management. The project will work on a *simple tool for on-farm irrigation scheduling*. A *circular evaluator* (attached at the end of the proposal), linking crop, soil, and climatic parameters, was developed through a collaboration between International Development Enterprises (Ethiopia, Myanmar) and University of Wageningen (Netherlands).

Our proposal will test the evaluator in the field to determine if it can make water/labour/economic efficiency gains over current practices. The project will bring together IDE's on-farm water management experience and on-farm drip irrigation demonstration network , and CARDI's in-depth soils and water research understanding.
The project will be performed in existing IDE drip irrigation demonstrations in Kampong Thom and Prey Veng provinces. IDE collaborates with PDA through seconding staff in its active provinces.
Primary crops for testing will be cauliflower and chilly.

Two years of funding are requested to cover two dry season crops (Dec/Jan – Feb/Mar and Feb/Mar – April/May) in each of 2009/10 and 2010/11, and associated preparation and analysis.
Budget requested is $16,980.

IDE specialises in developing market oriented enterprises in the agricultural, and WATSAN sectors. IDE currently supports a network of 25 Farm Business Advisors (60 by end-2009), who profit from improving farmers income. All new research outcomes are funneled through IDE to this network.

Project ID: RUA 221- Farmer's perspective in using water at Stung Chinit Irrigation Reservoir (SCIR)

Lead Organization: Royal University of Agriculture, RUA

Project Leader:

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Collaborating Institutions:

- Fisheries Administration Cantonment, Kampong Thom
- Coordinator, Water User Community, Kompong Thom Province, CEDAC
- Groupe de Recherche et d'échanges Technologiques, GRET

Project Budget: USD$ 5,000

Project Duration: June 2009 – May 2010

Project Overview:

To ensure food security and income generation of the farmers in the rural areas of Cambodia, agricultural activities should be strengthened especially water policy. In this case, Ministry of Agriculture, Fishery and Forestry (MAFF) and Ministry of Water Resources and Meteorology (MOWRAM) have worked closely with development partners and civil society to develop water supply network in the rural area. For instance, Stung Chinit Irrigation and Rural Infrastructure Project (SCIRIP) were organized under control of joining proposal between the Government and NGOs, Development Partner toward rehabilitating Stung Chinit scheme. The Stung Chinit Irrigation Reservoir (SCIR) was reconstructed through the rehabilitation project by GRET; ADB; AFD; and Government of Cambodia since 2001 as a six years project (2001 to 2006). The irrigation scheme was in Kompong Thmar Commune, Kompong Thom Province, Cambodia. Unfortunately, it is observed that despite having clear structure of water management including physical structure of the irrigation scheme and Farmer Water Use Community (FWUC), but farm activities in the region have been less blooming especially activities of rice paddy and cash crop. Currently, there is still less information clarifying about 'the ignoring of irrigation system and why do not the peasants crop for full year, while there were enough water in the canal?' It is a probing question for defining the face situation of farmers. This project will take 1 year to be revealed.

The project aims to define the real situation of farmers surrounding Stung Chinit irrigation scheme through studying deeply on farmers' attitude and the applying of new technologies conducted by the developers to farmer especially FWUC in Santouk district, Kompong Thom province. The study will take one year for the whole process and will be started from June 2009 to the end of May 2010 with the clear budget plan. It cost totally only USD 5057.85 to achieve with the fruitful result. This project was also involved senior researchers at RUA and outside.

The Beneficiaries of the project will spread to all vulnerable people in Stung Chinit scheme and others. FWUC is very important target group for this study. The report of research will be published in a local journal (CARF). The research team strongly believes that the finding of the research will be a key answer for the government and development partners and it will serve as a lesson learnt for the future irrigation development. Cambodian farmers will be the core beneficiaries from irrigation development since the information about the need of farmers in the target area will be clearly defined. This research will benefit to all development stakeholders, including farmers, local NGOs, sub-national and national government and development partners as well as the researchers and educators. On the other hand, During researching, some students and young staff in RUA will get opportunity to participate in this project to build their capacities.

Project ID: RUA 225 - Supplement forage legume to increase pig production of small holder farmer in Takeo Province

Lead Organization: Royal University of Agriculture, RUA

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Collaborating Institutions:

- Office of Animal Health and Production (OAHP), Provincial Department of Agriculture, Takeo Province
- Forage and Livestock Systems, CIAT

Project Budget: USD$ 18,326

Project Duration: July 2009 – June 2011

Project Overview:

Pig raising is still the mean for rice based farmer to save the money. The small scale farmers used the available resource such as rice bran, household waste and small amount of locally available green feed such spinach. As result, the growth rate of pig slow because of low protein content of the feed supply. With good experience from Laos, ACIAR project showed that the pig growth rate of small holder farmers could increase growth rate with supplement of fresh forage legume (stylo 184, *Stylosanthes guianensis*) (ACIAR-Partner Magazine, March-June 2008). Stylo contains high protein, grows well on poor soil and can be fed fresh to pig. With above experience, the project is proposed to introduce stylo 184 to small holder pig raising farmer in Takeo Provice in the in order to increase the animal productivities.

The project activities are conduct the on station experiment at Royal University of Agriculture, select farmers and introduced the forage legume, and follow up at farm level in order to measure the response of pigs to the supplement.

The project is to be implemented for 2 years (July 2009 to June 2011) with the estimated budget of 15,219.00US$. The project lead institution is Graduate School, Royal University of Agriculture in collaboration with Office of Animal Health and Production, in Takeo Province, and also technical supported from CIAT.

The beneficiaries from this project will be the university staff in term of capacity building and student to be on hand experience with applied research at farm level, officer of the department and office who gain more knowledge about applying forage legume to pig production. Farmer will have higher income from the pig production trough lower cost of input.