

RIICE Phase 2 Thailand – Summary Report

Achievements and Collaboration with National Stakeholders

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1. Overview of RIICE Phase 2

The Remote sensing-based Information and Insurance for Crops in Emerging Economies (RIICE) project offers rice crop monitoring to Cambodia, India, the Philippines, Thailand and Vietnam. The project improves food security planning and aims at introducing new or enhancing existing crop insurance programs in these countries. RIICE is a public-private partnership comprising of five project partners: SARMAP SA, a Swiss-based technology company is supplying the necessary remote sensing technology; the International Rice Research Institute (IRRI), with headquarters in the Philippines is collecting field data and estimating rice yields; Allianz Re is providing insurance services to smallholder farmers as beneficiaries; GIZ is providing capacity building and facilitating the political dialogue in India, the Philippines and Thailand. The Swiss Agency for Development and Cooperation (SDC) is the main funder of the Project. SDC is also providing capacity building and facilitating the political dialogue in Cambodia and Vietnam. In addition, a partnership with Swiss Re is envisaged to start in 2017. However, a successful work of RIICE would not be possible without the cooperation with various local partner agencies and institutions, such as FPO, BAAC and Rice Department.

1.1 Rice Phase 2 in Thailand

The RIICE project in Thailand pursues the objective of increasing the efficiency and transparency of the agricultural insurance scheme. Therefore, GIZ who implements RIICE in Thailand engaged in several activities, such as evaluating scheme design options, technology development, pilot-planning and preparing and capacitating partners at several multi-stakeholder workshops. As for Thailand, RIICE seeks to engage with Thai partners to explore the use of satellite information to improve the current crop insurance programme, including data collection, insurance product design and capacity development for partners.

For the Scope of RIICE Phase II, activities are divided into two components. First component consists of insurance product design & piloting, including consultation, sharing experience, and supporting stakeholder collaboration through Concept Note & Exchange of Letter with FPO which appear as Annex 1 & 2. The second component focuses on remote-sensing technology application through Letter of Agreement (LoA) among RD, GISTDA, DoAE, IRRI, SARMAP which appears as Annex 3.

This report summarizes the achievements and progress of the RIICE phase 2 in Thailand and the collaboration with FPO and other stakeholders. This report shall also

serve as a basis for future collaboration between FPO and the project in RIICE Phase 3. Therefore, it also contains prerequisites for a further fruitful cooperation between the RIICE consortium, FPO and other Thai stakeholders.

2. Results of RIICE Phase 2 in Thailand

Based on two project components, the results of RIICE Phase 2 in Thailand are divided into Insurance Product Design & Piloting and Remote Sensing Technology Application.

2.1 Insurance Product Design & Piloting

Under the first component of RIICE project, Concept Note with work packages proposed and discussed with FPO on RIICE phase 2 has been developed and Exchange Letter proposing collaboration between GIZ and FPO to strengthen crop insurance has been signed by both parties. This component focused on developing area yield index insurance (AYII) pilot model, consulting and sharing experiences of AYII, and supporting stakeholder collaboration related to crop insurance.

Develop Pilot Model

Since 2012, the RIICE project has engaged with different Thai stakeholders regarding opportunities for the improvement of the current Thai rice insurance scheme with the vision in mind to make it financially viable, politically stable and technically sound. RIICE assessed the strengths and challenges of the Thai rice scheme and developed a proposal for a SAR-based area yield index insurance scheme (AYII) in a “Green Paper on AYII” in 2013, thereby, taking into account the structure of the National Disaster programme for smallholders.

In January 2014, RIICE explained its objective and setup to FPO, proposed an intensified collaboration and depicted further steps in Thailand. Furthermore, RIICE conducted a stakeholder workshop on the Thai crop insurance scheme and the way forward in Hua Hin in July 2014. The aim of the workshop was to provide a platform for key stakeholders of rice crop insurance in Thailand to discuss weaknesses of the current scheme and to find a common understanding on what substantial changes are necessary to improve Thailand’s disaster risk financing strategy for farmers. A number of representatives from various organizations participated, such as FPO, BAAC, DoAE, OIC, Thai GIA, Thaivivat, Kasetsart University, Dhipaya insurance and Chao Phaya insurance. Moreover, a study on “The demand assessment of AYII with Thai farmers” conducted by Kasetsart University was presented during the workshop.

Throughout 2014, RIICE dry tested an AYII product in its two rice monitoring test districts, compared to selected test sites only in RIICE Phase 1. To simulate a real area yield-based crop insurance product, RIICE has calculated the pricing and tested the functioning of satellite technology in an insurance setting. The core areas tested were the appropriateness of the AYII product design, the functionality and timeliness of a SAR-based yield assessment, the key steps in the distribution process and the key steps in the claims process.

In follow up meetings and discussions with FPO, RIICE presented considerations for a new crop insurance programme in Thailand. These included key features of a revised crop insurance system for Thailand and a dry test of a satellite-supported area yield-index insurance product.

In addition, in January 2014, RIICE conducted a workshop with BAAC on the improvement of the current scheme, its processes and distribution. Additionally, an assessment of the feasibility of a SAR-based AYII from BAAC point of view was discussed. This led to the development of the so called “BAAC business plan”, containing various points of action and strategies for BAAC on how to strengthen the outreach of the previous top-up insurance programme, their internal processes and interfaces with other stakeholders.

In January 2016 another stakeholder workshop was conducted, where RIICE presented a concept for an area yield index insurance pilot tying to the challenges of the current scheme identified in 2014. Allianz Re presented an analysis about the Thai rice production and the existing scheme. Furthermore, product development was discussed. The improvements on the distribution side had been acknowledged and valued by BAAC, helping the bank to improve efficiency and insurance sales practices that benefited the overall crop insurance programme.

RIICE suggests to stakeholders to explore the technology use by providing additional transparency around certain loss cases that are disputed. Such a demonstration should be made retrospectively for 2016 and (provided that stakeholders see a value and are prepared to invest in it) also for 2017 and beyond.

In January 2016, RIICE conducted a stakeholder workshop about an “Area Yield Index insurance pilot” in 2016. The objective of the workshop was to inform all stakeholders involved in the Thai crop insurance scheme on the planned area yield index insurance pilot and to provide a platform for discussing key elements and finding a common understanding on the roles and responsibilities in the implementation for a pilot in the main season of 2016. Participants of the workshop included FPO, BAAC, OIC, Thai Rice Department, DoAE, OAE, Thai GIA, Thaivivat, Allianz CP, Aon Benfield, Swiss Re and RIICE partners (IRRI, Sarmap, Allianz Re, GIZ). In particular, the focus lay on informing, seeking a common understanding of the roles and responsibilities amongst the stakeholders and on clarifying requirements of the pilot (e.g. subsidies, regulatory

issues). Moreover, product features and operational issues were discussed and feedbacks from the insurance pool and reinsurers were obtained. Summary of stakeholder workshop appears as Annex 4.

This was followed by the preparation of an AYII pilot for the main wet season from May 2016 – December 2016. Throughout, the process a consultant collected and analyzed historical yield data for the chosen pilot districts. Moreover, RIICE and the Thai technical implementation partners provided the technical products (area and yield) to be able to conduct the insurance pilot. Allianz RE worked out three different product pricing options. Additionally, Allianz Re and Thaivivat started working on the wording of a policy. Last but not least, pilot processes and farmer registration level, sales via BAAC and claims assessment were analyzed and discussed with stakeholders.

FPO organized meeting on an Area Yield Index Insurance (AYII) Pilot in January 2017. GIZ and IRRI on behalf of RIICE presented a concept and explained the technical feasibility of a pilot to Thai stakeholders (BAAC, OAE, GISTDA, Bank of Thailand, OIC and Thai GIA). The Meeting concluded that AYII in Thailand is pre-matured but needs exchanging experience and information. The Meeting supported the idea to continue to explore the development of AYII through a pilot.

However, the historical data (field collection) from OAE is currently available at district level. Before conducting a pilot implementation of AYII, it is necessary that concerned agencies (OAE, DoAE and BAAC) compile at least 10-year historical data at the plot level to compare with the data generated by satellite (field validation) in order to support the development and payout of an AYII policy product. This may require the establishment of data infrastructure by the concerned agencies. Moreover, necessary subsidies have to be agreed upon with FPO. Another important point is the official acceptance of OAE on area yield derived from SAR technology for an insurance purpose. Further prerequisites are the pilot can make use of the BAAC distribution infrastructure and a selected geography only offer the area yield based RIICE product, so that the RIICE product does not compete with other products in the same geography. Additionally, Thaivivat needs to come on board again as the primary insurer and Swiss Re needs to provide reinsurance.

Examples/Experiences of AYII

From international experiences, agriculture production is underinsured, particularly in emerging and developing markets. However, recent trends in agriculture insurance show that there is a growing number of crop insurance programs for smallholders. Agriculture insurance has evolved from publicly provided multi-peril crop insurance (MPCI) programs towards insurance tied to named perils and index-based products, and index-based solutions have been driving the fast growth of insurance premiums

globally. In addition, private sector has expanded its role mostly through public-private partnerships. Furthermore, increased government support in the form of premium subsidies and/or large-scale government insurance schemes helped to make schemes available to farmers that would otherwise not be commercially viable. Moreover, innovations in technology and distribution allow for an outreach to rural areas at affordable costs, i.e. digital delivery, and bundling.

In India, the government has setup the government supported area-based insurance program (Pradhan Mantri Fasal Bima Yojana (PMFBY)). In the state of Tamil Nadu, since 2016 RIICE technology has been used for settling preventive sowing claims or around 15,000 farmers as of June 2017. Under this prevented or failed sowing cover farmers received an average pay-out of around 200 EUR if in their village rice could only be sown in less than 25% of the rice growing area because of too little or too much rain.

Stakeholder Collaboration

GIZ/RIICE organized a AYII stakeholder workshop in January 2016 with participants from various organizations, which also served as a coordination platform amongst agencies. Throughout RIICE Phase 2, there have been several meetings between FPO and GIZ/RIICE discussing activities, workshops and options for the Thai rice insurance scheme. FPO was also invited to and engaged in two governmental capacity building workshops (Vietnam and Indonesia).

2.2 Remote Sensing Technology Application

Under the second component of RIICE project, Letter of Agreement (LoA) among RD, GISTDA, DoAE, IRRI, sarmap SA for implementing activities related to remote sensing technology application has been developed. The LoA has been signed by all parties, except DoAE. This component focused on mainstreaming processing and validation of rice maps products, and provided technology know how transfer for SAR processing and crop yield simulation and ground data collection by sarmap and IRRI to RD, DOAE, and GISTDA.

Collaboration & Coverage

- Collaboration with Rice Department (RD) allowed RIICE project to achieve the goal in phase 2 to cover rice monitoring of 19 provinces across Central Plain, North East, and North Thailand during rice wet season 2016.
- DOAE and GISTDA participated in the early model parameterization & validation during rice wet season 2015. Due to the delay in signing of the Letter of

Agreement (LOA) by the Thailand national partners, only Rice Department continued full activities supporting sarmap and IRRI team in generating and validating rice monitoring products that include cultivated rice area at mid-season and end of season, rice start of season information at mid-season and end of season, yield forecast and end of season yield estimates. Rice Department took the initiative to actively support RIICE activities under the environment of the existing bilateral collaboration with IRRI.

- Since the start of RIICE project in 2012, RIICE has conducted 8 training courses to MOAC and GISTDA staffs on system operation and protocol for collecting ground data for system calibration and products validation.

Products Accuracy & Effectiveness

- RIICE project has maintained high product accuracy/agreement of 85% or above both for cultivated rice area and yield estimates.
- In term of effectiveness, yield forecast and estimates were made available timely during mid-season and soon after the season ended, respectively. In 2016, yield forecast for the irrigated environment in Central Plain and North Thailand were made available 19 August whereas end of season yield estimates were generated by 31 October. Given rice maturity duration is longer, for the rainfed environment yield forecast and end of season estimates were generated later at 14 November and 16 December, respectively. By the time of this reporting official yield data from OAE were not yet available and thus not possible to assess accuracy of the 2016 season yield estimates.

Technical Advantages & Methodology

- Technical advantages:
 - Synthetic Aperture Radar (SAR) satellite systems are weather independent; hence these sensors ensure high quality data with higher temporal frequency irrespective of the cloudy skies.
 - The Sentinel-1 satellite by the European Space Agency (of which Switzerland is a member) is providing raw data free of charge.
 - Sarmap and IRRI provide long experience in remote sensing and crop modeling, the team provided operational software (SAR data processing and crop yield modeling) and guide Thailand national RIICE partners in processing the satellite data to generate yield information.

- Generated rice area products were validated based on land-use survey method by randomly evaluating geographical locations whether it is identified as rice or non-rice by the model and in the reality. In addition aggregated rice area at district and provincial level was also compared against reported rice area data from DOAE. Such exercise was conducted collaboratively between IRRI team and Rice Department team in 2016.
- Yield estimates generated by RIICE were compared against official yield data from Office of Agricultural Economics (OAE). The agreement level between modeled yield and the official yield was then assessed.

Highlight outputs for RIICE phase 2 are rice area maps and yield forecast and estimates were generated for rice growing areas in North, Central, and North East Thailand (accuracy >85%), drought maps and ground verification were conducted in Central Plain/Suphan Buri for 2015 Wet Season, rice planting dates map revealed 1 million ha of rice with late planting during 2016 Wet Season and demonstrated capacity to assess pest damage (BPH) using combination of satellite and unmanned aerial vehicle (UAV) remote sensing – case study in Ayutthaya in 2016 Wet Season.

In summary, RIICE provides accurate & timely estimates of rice planting dates and area, accurate & timely estimates and forecasts of rice yield, accurate & timely estimates of damage from flood or drought, protocols for rapid and low cost field observations, and software, training and capacity building on the above.

3. Recommendations and Outlook for RIICE Phase 3 in Thailand

Before the end of phase II, RIICE Thailand Stakeholders Meeting has been conducted at FPO on 27 January 2017. It has been concluded that AYII is pre-matured but needs exchanging experience and information. Thailand focuses on improving the existing crop insurance scheme instead of introducing new crop insurance product. For RIICE phase 3 in Thailand, there is an opportunity to explore the possibility for strengthening remote-sensing technology application to improve the current crop insurance scheme and support other non-insurance purposes. This includes improving the disaster declaration mechanism and post-event damage/loss assessment to speed up the compensation process, and providing other agricultural insurance advisory supports and services to build foundation and readiness for the implementation of remote sensing technology and area-yield index insurance (AYII).

RIICE Phase III has an expected impact to reduce the vulnerability of smallholders in rice production caused by natural catastrophes with overall outcome to have 0.5 million smallholder farmers in at least 2 countries covered by RIICE-supported insurance

solutions. The project targets small-scale rice farmers in Cambodia, Vietnam, India, Thailand, and possibly Indonesia. The consortium partners are SDC, Sarmap, IRRI, Swiss Re, and GIZ. The project duration is from July 2017 to December 2019 with possible extension to 2020.

Appendix A: Rice Monitoring System Diagram

1. MAPscape-RICE generates a set of cultivated rice area and start of season maps for the target duration (either up to mid-season or end of rice growing season);
2. Rice start of season information along with leaf area index (LAI) information derived from SAR image analysis were then assimilated into ORYZA crop growth model. Together with weather, soil, and agronomic management data, these information were then converted into yield forecast and/or end of season yield estimates
3. In case of major catastrophes (storm, flooding, drought), additional information including information on the affected area and related rice damages were generated on need basis.

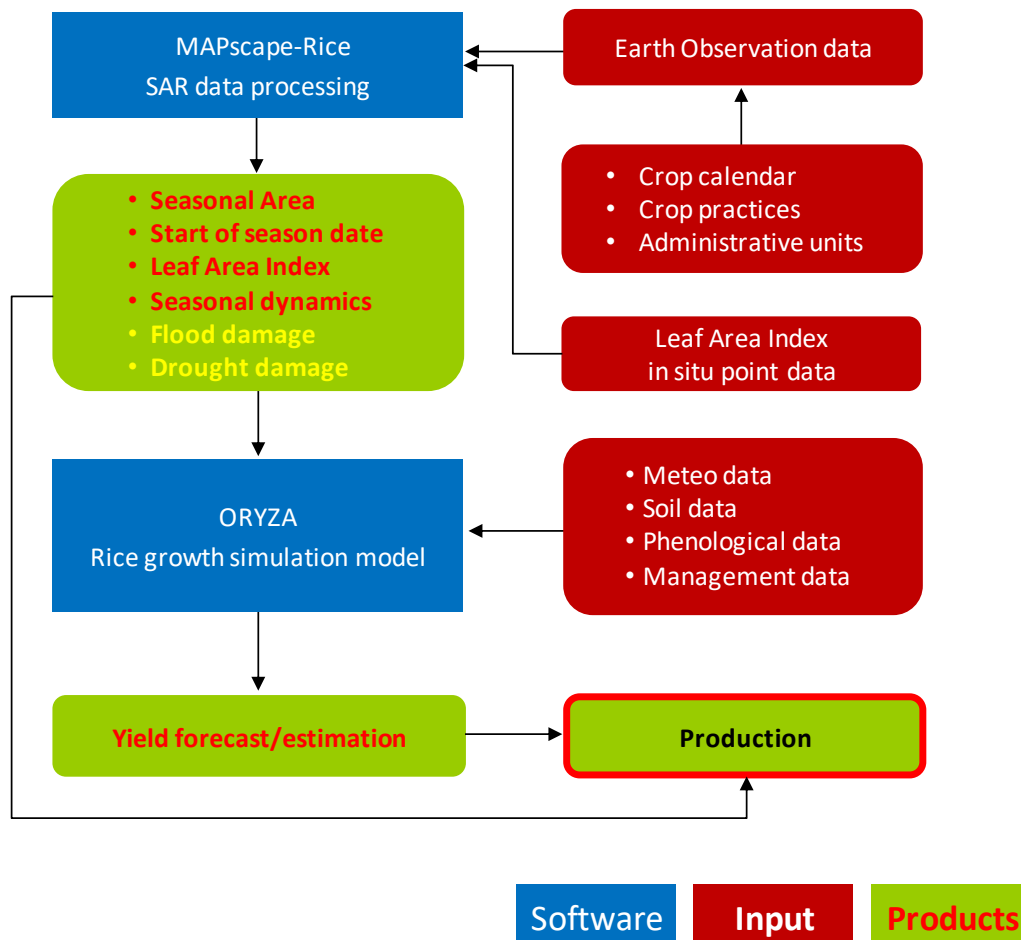


Figure 1. RIICE System Operational Diagram

Appendix B: Mid-season Yield Forecast for 2016 Wet Season in the Irrigated Ecosystem

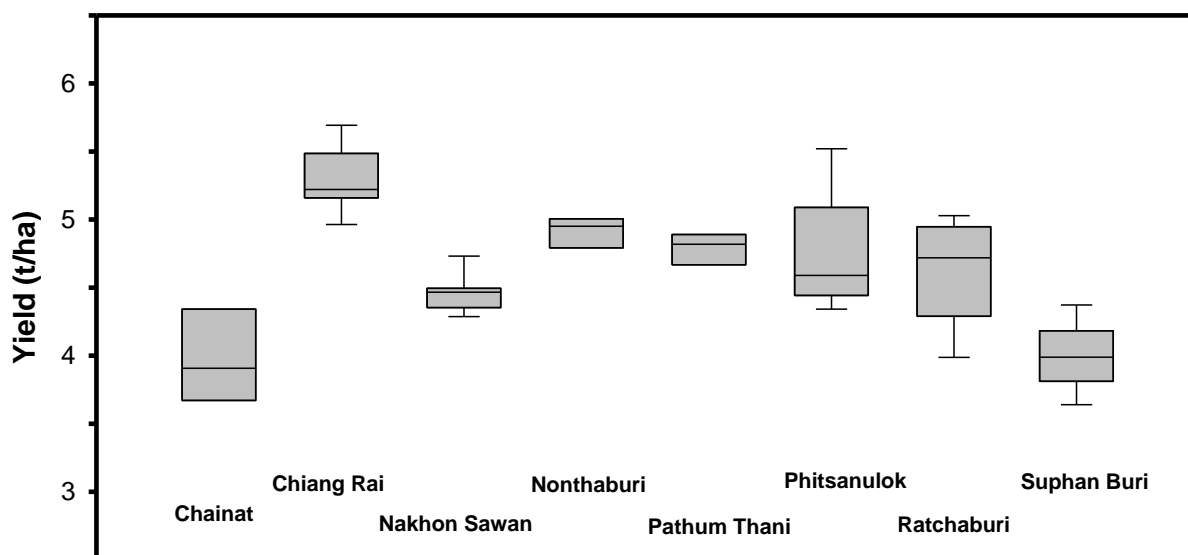


Figure 2. Mid-season yield forecast for 2016 wet season in the irrigated ecosystem. The products were made available by 19 August.

Appendix C: Start of Season Rice Map

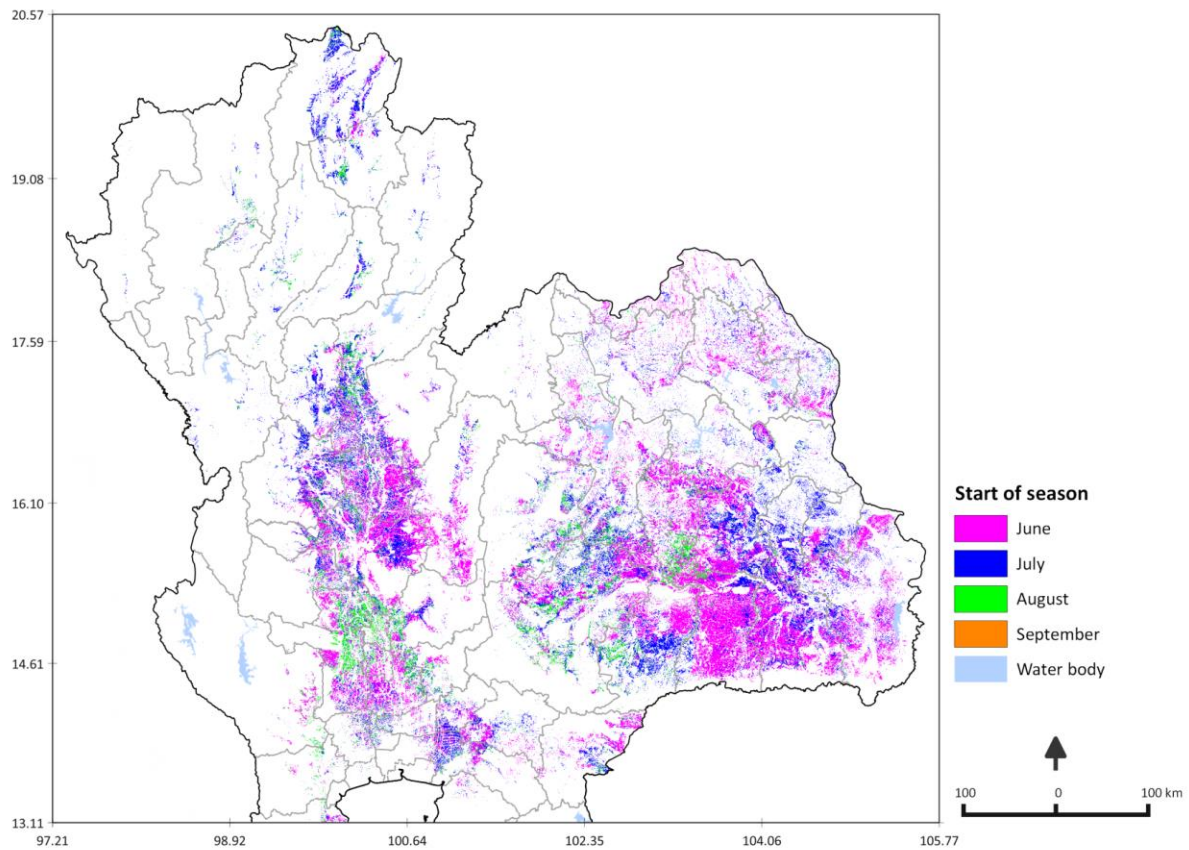


Figure 3. Start of season rice map made available in early December 2016 providing detailed crop progression status with critical information such as delayed in rice planting detected in over 1 million of rice area (in green) presumably due moisture deficit early in the season.

Appendix D: Detection of El-Niño over Cultivated Rice

Drought map
May-June 2015
From SENTINEL-
1A (20m
resolution)

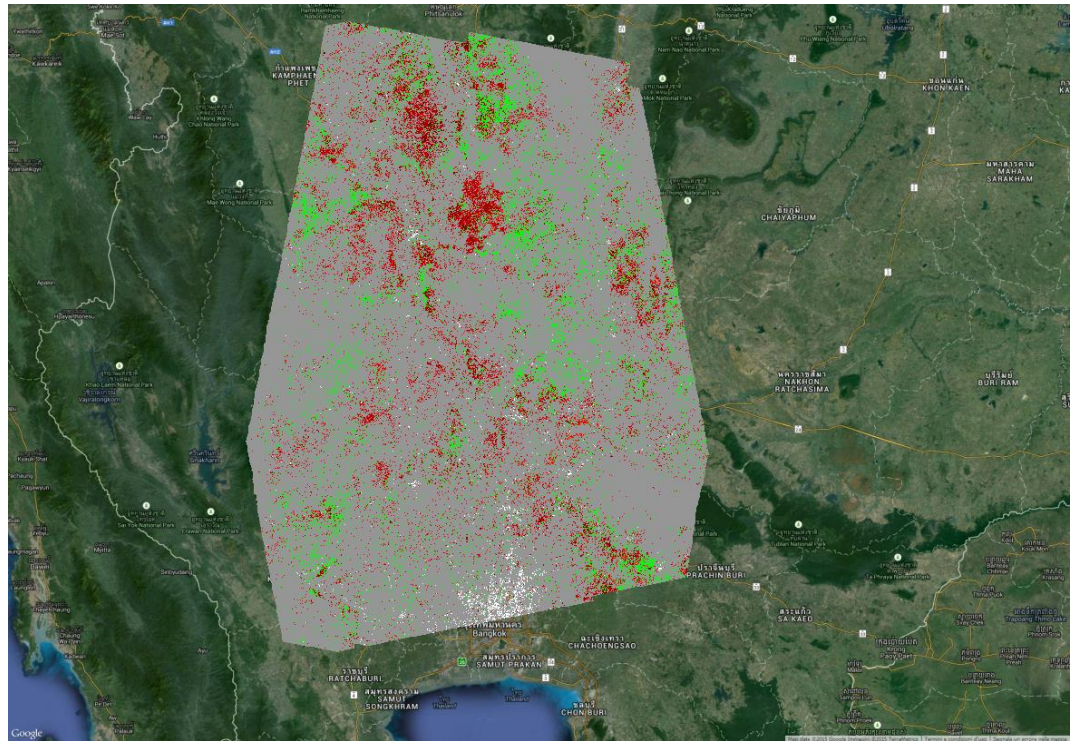
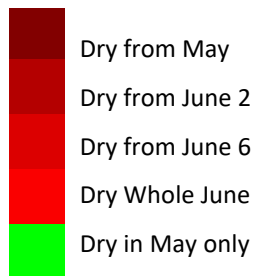


Figure 4. Detection of El-Niño driven drought during May to June over cultivated rice during wet season 2015 in Central plain Thailand using the SAR technology implemented by RIICE in Thailand.



Remote Sensing based Information and Insurance for Crops in Emerging Economies

Concept note with work packages proposed and discussed with FPO on RIICE phase II

11 December 2014 at FPO office

*Present: the RIICE team (Susan G. / Juthatip T. / Suriyan V. / Michael A.)
and FPO (Khun Lavaron Sangsnit and team)*

Value Proposition

RIICE is a unique partnership of public, private and academic actors that brings latest satellite technology to use for crop insurance in Asian economies.

The project has been providing capacity building to Thai partners in the Ministry of Agriculture and the space agency GISTDA since 2012 with a view to equip partners to make satellite-based rice yield forecasts already at mid-season and provide final yield estimates at high accuracies right after the end of the cropping season.

On the insurance side, the project is advising governments and insurance stakeholders in Asian economies to build robust and sustainable crop insurance programmes that attract private capital and are providing value for smallholder rice farmers. For that purposes, RIICE had been working with BAAC to support the agricultural lending bank to improve their systems for selling crop insurance and designing insurance literacy materials for BAAC.

RIICE has also priced crop insurance products for two pilot project sites that have been selected to test the whole RIICE operational system. These are Nakorn Ratchasima Province representing rain-fed rice and Suphan Buri Province representing irrigated, intensive rice production. For these test sites RIICE was successful in delivering a proof of the technology concept by providing products such as accurate rice area maps, seasonality maps, and yield forecasts during the season as well as yield estimates at the end of the season. The 2013 flood incident and rice area loss in some parts of Nakorn Ratchasima Province were accurately reported by RIICE within a few days after the incident happened. All of this information is made available to partners through Thailand WebGIS portal.



Remote Sensing based Information and Insurance for Crops in Emerging Economies

RIICE is jointly implemented by five partners: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Allianz Re, International Rice Research Institute (IRRI), sarmap and the Swiss Agency for Development and Cooperation (SDC).



Remote Sensing based Information and Insurance for Crops in Emerging Economies

Public Private Partnership Set-up

All major crop insurance programmes around the world are organised as public private partnerships. Such a setting is making the most efficient use of public and private system: The private side brings in efficient service, the public side is making best use of its capital, jointly do they achieve a fair price through a broad risk diversification.

RIICE believes that both the Ministry of Agriculture and the Fiscal Policy Office are the key public partners of in Thailand to bring about a broad and state-of-the-art crop insurance programme. The project is therefore offering to accompany those partners on their path to a robust crop insurance programme.

This concept note addresses the need for collaboration between RIICE (through GIZ) and the Fiscal Policy Office on crop insurance.

Vision

An effective and efficient nation-wide crop insurance system in Thailand that reduces the vulnerability of Thai rice small holder farmers against natural disasters is fully operational and institutionalized.

Objectives

RIICE Phase II has the main objective to support further strengthening of rice loss and yield monitoring and based on that, planning and implementation of crop insurance in the rice sector as a public-private partnership with the following specific objectives:

1. Short-term: Supporting FPO, BAAC and other crop insurance stakeholders in improving the current scheme.
2. Medium-term: Supporting Thai stakeholders in analyzing how to merge their two current schemes (disaster relief scheme and top-up insurance scheme) and designing a viable new set-up.
3. Medium-term: Supporting Thai stakeholders in studying the potential for an integration of satellite-supported technology applications in their crop insurance scheme including testing the feasibility of a SAR-supported area-yield crop insurance product.



Remote Sensing based Information and Insurance for Crops in Emerging Economies

Proposed work packages

Work Package 1

RIICE will act as an advisor to the FPO on matters with regards to crop insurance

Rationale

RIICE proposes to advise the FPO on key challenges with regards to crop insurance design. The issues to be investigated by RIICE in its advisory capacity are defined below. The aim is to better equip FPO to mandate solutions to particular challenges relating to scheme design, product design and implementation. RIICE will also draw on experts beyond the RIICE parties to provide advisory to the FPO. An active collaboration of FPO in the definition and discussion of the challenges is essential.

In its advisory role, GIZ/RIICE will give input on issues pertaining to crop insurance. The issues will be set between GIZ and the FPO. A close participation of FPO in the working sessions is required. The FPO would be its Chair as well as the prime addressee of the work but could share it to other members of the Technical Insurance Working Group.

Furthermore FPO could use the work output as a contribution to the **National Rice Policy Committee** to which FPO has the responsibility to provide input on crop insurance related issues and recommendations. FPO could assign RIICE to research into pertinent questions, analyze linkages to other rice policy measures and prepare reports or any other input for FPO to be presented at the National Rice Policy Committee.

Proposed work involved

Issues that RIICE and FPO should address are listed here. The corresponding activities are indicative and shall be decided upon further elaboration with the FPO.

- a.) **Scheme design options** for Thailand, taking into account the structure of the National Disaster programme for smallholders. Activities may include:
 - Drafting product design and product delivery options for a national crop insurance programme that incorporates the current national disaster scheme; work to be undertaken jointly with the (re-)insurance community.
 - Drafting different options for risk transfer mechanism with the reinsurance market;
 - Proposing product options that make use of satellite technology.
 - Searching for (loss-/yield-) data for product design, jointly with OAE.
 - Government involvement: roles and responsibilities
- b.) **Testing and piloting** product set-ups agreed (in 2015) and tested in a pilot (in 2016 and beyond).
 - Simulate different insurance products that use remote sensing technology as a basis for loss adjustment.
- c.) Prepare **business plan** for rice scheme for 2015.



Remote Sensing based Information and Insurance for Crops in Emerging Economies

- Plan for sales projection for next year with BAAC's inputs by each region and also sales activities and features in different areas.
- Undertake a due diligence with BAAC to examine its capacity to administer a larger base of clients.

d.) **Pool arrangements** in crop insurance programme design

- Study examples of pool arrangements in other countries in crop insurance (e.g. Turkey, Spain, Mexico) to analyze potential applications in the Thai system
- Options for managing the interface between the pool leader and the distributor (here: BAAC). (Deliverable: process map with input from all stakeholders).

The deliverables of the task force topics would be “issue papers” in the form of a presentation or similar that is being discussed jointly with FPO.

The activities are indicative and subject to further elaboration jointly with FPO.

Work Package 2

RIICE supports the coordination of key stakeholders related to crop insurance

Rationale:

The parties involved in crop insurance in Thailand (FPO, BAAC, Thai GIA, OIC, DOAE and selected insurance companies) are meeting several times a year on an ad-hoc basis to discuss outstanding issues (mostly operational and planning matters) related to crop insurance. The meetings are set up in an ad-hoc way as issues arise. There is no defined structure in terms of minute taking, dissemination and follow-up.

Proposed work involved

GIZ/RIICE proposes to coordinate the meetings among the related parties in order to support FPO in organizing and following-up of meetings in a structured and professionally managed way. At the same time GIZ/RIICE provide facilitative and advisory support by monitoring time-critical issues, documenting stakeholder inputs and following-up.

- Setting meeting agendas in accordance with FPO, writing minutes and disseminates it to the group members
- Supporting the FPO or another convening stakeholders in setting up an operational plan including defining activities, setting milestones and defining responsibilities
- Facilitating inter-agency consultations
- Providing technical support to issues and challenges in the implementation of the operational issues
- Monitoring of decision and also following-up



Remote Sensing based Information and Insurance for Crops in Emerging Economies

Term and set-up

The cooperation will start in May 2015, coinciding with the beginning of phase II of the RIICE project and will last for 24 months.

Following an exchange of letters between GIZ and FPO, an activity plan will be developed between RIICE (Khun Juthatip) and FPO (designated person to be named). At least bi-monthly exchanges take place to review the results of the advisory activities; they may also be held more frequently if an issue arises.



No. 1008/ 89

Fiscal Policy Office
Ministry of Finance
Rama VI Road
Bangkok 10400

12 January B.E. 2558 (2015)

Dear Mr. David Oberhuber,

**Subject: The exchange letter proposing collaboration between GIZ and FPO
to strengthen Crop Insurance**

Reference is made to your letter dated December 17th 2014, proposing the collaboration between GIZ and FPO to strengthen Crop Insurance through the implementation of the Remote Sensing Based Information and Insurance for Crops in Emerging Economies (RIICE) Phase II (2015-2017) through the concept note with work packages proposed and discussed with the FPO on RIICE phase II.

In this regard, we would like to inform you that we are accepting the aforementioned concept note as we agreed. We believe that enhanced cooperation will lead to a mutually beneficial relationship between FPO and GIZ and will ultimately lead to further development of the rice insurance system in Thailand.

Yours sincerely,

Krisada Chinavicharana
Director General
Fiscal Policy Office

German Development Cooperation
GIZ Office Bangkok
193/63 Lake Rajada Office Complex
New Ratchadapisek-Rama IV Road,
Klongtoey, Bangkok 10110

GTZ Office Bangkok, No. P-086	
Received	Iskolar
Replied	
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LETTER OF AGREEMENT (LOA)

between

International Rice Research Institute

and

Rice Department of Thailand (PLA: C-2015-47)

and

Geo-Informatics and Space Technology Development Agency (PLA: C-2015-49)

and

Department of Agricultural Extension (PLA: C-2015-51)

and

sarmap SA

AGREEMENT

This Agreement is entered into by and among:

International Rice Research Institute (IRRI), a nonprofit autonomous international organization, with headquarters at the Municipality of Los Baños, Province of Laguna, Republic of the Philippines, represented herein by its Director General, **Dr. Matthew K. Morell**, hereinafter referred to as “IRRI”; and

Rice Department of Thailand (RD), Minister of Agricultural and Cooperatives of Thailand, located at 50 Paholyothin Road, Ladyao , Chatuchak, Bangkok, Thailand, 10900, represented herein by its Director General, **Mr. Anan Suwannarat**, hereinafter referred to as “RD”;

Geo-Informatics and Space Technology Development Agency (GISTDA), Ministry of Science and Technology of Thailand, established as a public organization under the Royal Decree on the establishment of GISTDA B.E. 2543, located at 120 The Government Complex, Ratthaprasasanabhakti Building 6th and 7th Floor, Chaeng Wattana Road, Lak Si, Bangkok Thailand, 10210, represented herein by its Executive Director, **Dr. Anond Snidvongs**, hereinafter referred to as “GISTDA”; and

Department of Agricultural Extension (DOAE), Ministry of Agricultural and Cooperatives of Thailand, located at 2143/1 Paholyothin Road, Ladyao , Chatuchak, Bangkok, Thailand, 10900, represented herein by its Director General, **Mr. Somchai Charnnarongkul**, hereinafter referred to as “DOAE”; and

sarmap S.A., a Swiss company located at Cascine di Barico, 6989 Purasca, Switzerland, represented herein by its CEO **Dr. Francesco Holecz**, hereinafter referred to as “sarmap”;

WHEREAS, IRRI was established as a rice research and development institute that conducts researches and trainings to reduce hunger and poverty, improve the health of farmers and consumers, and ensure environmental sustainability through collaborative research, partnerships, and strengthening national agricultural research and extension systems;

WHEREAS, RD was established as national organization which mainly responsible in rice research and development and promote production efficiency as well as to cooperation with international to sustainably build capacity for farmers;

WHEREAS, GISTDA is responsible for space technology and geoinformatics including satellite data reception, distribution, applications, human resource development and satellite development.

WHEREAS DOAE was established as the national core organization to promote and develop farmers to produce agricultural products with good quality and be self-reliant by 1) transferring agricultural production technology to farmers; 2) promoting and developing farmers and farmers' organizations. 3; providing services and agricultural occupational training to farmer; as well as being the focal point for National Disaster Relief operation for farmers.

WHEREAS, sarmap's business is to build and provide an innovative remote sensing software products and services dedicated to the generation of digital information for better management and risk assessment of earth's natural resources;

Recognizing the goals of the Remote Sensing based Information and Insurance for Crops in Emerging economies (RIICE) project to develop technologies for rice crop monitoring for food security and crop insurance applications in Thailand, hereinafter referred to as the "Project".

THEREFORE, ALL PARTIES HAVE AGREED AS FOLLOWS:

ARTICLE 1- SCOPE OF ACTIVITIES

- i) Activities to be conducted by each partner

Detailed activities are annexed in the workplan, while the general responsibilities of each partner are outlined as follows

IRRI	<ol style="list-style-type: none">1. Assign staff who will conduct IRRI led activities, attend meetings and train partners.2. Support RD, GISTDA, DOAE and sarmap in project development, project management, project implementation and project reporting.3. Provide training, mentoring and troubleshooting on RIICE technologies and protocols related to field monitoring, equipment use, yield estimation, cloud computing platforms and data management.4. Provide smartphones and smartphone applications to RD and DOAE for field data collection activities.5. Prepare and provide data needed for yield estimation.6. Estimate yield using ORYZA at district level and compare these estimates to district level reported yield and provide these estimates to the project partners.7. Participate in project discussions and provide inputs for other project activities as needed.
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	<p>8. Report on RIICE project activities internally and to stakeholders on agreed timelines.</p> <p>9. Monitor and evaluate project activities and report to the donor.</p>
RD	<p>1. Set up RIICE Thailand project working committee and assign a project coordinator.</p> <p>2. Coordinate and monitor RIICE project activities, events and training.</p> <p>3. Assign staff who will conduct field and desk based activities for rice crop monitoring in representative sites.</p> <p>4. Select monitoring sites, conduct field monitoring and provide monitoring information to the project.</p> <p>5. Be the local resources person for training and national focal point for operational consultation.</p> <p>6. Perform quality control of the data and the mapping products.</p> <p>7. Participate in project discussions and provide inputs for other project activities as needed.</p> <p>8. Report on RIICE project activities internally and to stakeholders on agreed timelines.</p>
GISTDA	<p>1. Assign staff who will conduct GISTDA led activities, attend meetings and undergo training.</p> <p>2. Acquire and process regular SAR data for seasonal rice product generation and emergency request SAR data for flood mapping.</p> <p>3. Manage data dissemination platform for RIICE.</p> <p>4. Participate in project discussions and provide inputs for other project activities as needed.</p> <p>5. Report on RIICE project activities internally and to stakeholders on agreed timelines.</p>
DOAE	<p>1. Assign staff who will conduct DOAE led activities, attend meetings and undergo training.</p> <p>2. Assess user demands for RIICE products.</p> <p>3. Perform rice map validation each season and share validation results to the project.</p> <p>4. Participate in project discussions and provide inputs for other project activities as needed.</p> <p>5. Report on RIICE project activities internally and to stakeholders on agreed timelines.</p>
sarmap	<p>1. Assign staff who will conduct sarmap led activities (as 2.-5.), attend meetings and train national partners.</p> <p>2. Provide to all national partners with a) training on SAR data acquisition, SAR data processing, SAR product accuracy assessment, cloud computing and SAR data management, and b) mentoring and troubleshooting on RIICE technologies and protocols related to SAR.</p> <p>3. Provide MAPscape-RICE executable (software license) for the duration of the project under the condition that MAPscape-RICE will neither be used for commercial purposes nor distributed to third parties.</p> <p>4. Participate in project discussions and provide inputs for other project activities as needed.</p> <p>5. Report on RIICE project activities internally and to stakeholders on agreed timelines.</p>

ii) Reporting schedule

RD, GISTDA, and DOAE shall submit reports to IRRI on the following schedule.

	Due Date	Report Type	Title of Report
1	30 th June 2015	Technical & financial reports	1 st bi-annual report (Project initiation report)
2	31 st Dec 2015	Technical & financial reports	1 st end of year report
3	30 th June 2016	Technical & financial reports	2 nd bi-annual report
4	31 st Dec 2016	Technical & financial reports	2 nd end of year report
5	30 th April 2017	Technical & financial reports	End of project report

iii) Payment schedule

Payment amounts per partner are detailed in Annex 2. First payment from IRRI to RD, GISTDA, and DOAE shall be processed upon receipt of funds from the donor. Subsequent releases will be subject to availability of funds, liquidation of at least 75% of the released funds, satisfactory delivery of agreed outputs/milestones, and satisfactory narrative and financial reports.

Payment name	Amount (USD)	Amount	Paid on or after
1st Payment (Advance Payment)	US Dollars	60% of year one funds	Upon receipt of funds from the donor
2nd Payment (Outstanding balance for 2015 and for first semester 2016 after delivery of reporting as of 31.12.2015)	US Dollars	40% of year one funds plus 30% of year two funds	2016-02-01
3rd Payment (after delivery of reporting as of 30.06.2016)	US Dollars	60% of year two funds	2016-08-01
4th Payment (Outstanding balance for 2016 and for first semester 2017 after delivery of reporting as of 31.12.2016)	US Dollars	40% of year two funds	2017-02-01

Within thirty (30) days after completion of the activity, RD, GISTDA, and DOAE shall return to IRRI any unutilized funds, which must be reflected in the financial statements.

ARTICLE 2 - IMPLEMENTATION OF THE AGREEMENT

In order to coordinate the implementation of this project, the Parties shall set up a Joint Committee, hereinafter referred to as “the Committee”, with an equal number of members from all Parties. The Committee will meet in Thailand on an annual basis or as considered most appropriate by the Parties.

ARTICLE 3 - AVAILABILITY OF RESOURCES

Cooperative activities under the LOA shall be subject to the availability of funds. Each Party shall be responsible for its own expenditures.

ARTICLE 4 - INTELLECTUAL PROPERTY

i. All research materials used in the collaboration will be transferred using Material Transfer Agreements (MTA). Further, the transfer of biological materials, including breeding materials and germplasm, will be subject to pertinent biosafety and bioprospecting laws, rules, and regulations. Either party may use such materials for non-commercial research purposes, but will give full credit to the source of the materials.

ii. Ownership of any Intellectual Property (hereinafter “IP”) developed through this collaborative research will be determined in accordance with applicable law and the IP policy of IRRI and the other Parties. The Parties also expressly decide that global accessibility and impact as well as any commercial licensing and use of all intellectual assets/properties developed under this LOA will be subject to the CGIAR Principles and Guidelines on the Management of Intellectual Assets (ref: <http://www.cgiar.org/consortium-news/principles-on-management-of-intellectual-assets-approved/>)

It is understood and agreed that Intellectual Property developed by IRRI and/or other partners prior to the collaboration (“Prior IP”) will remain IRRI’s and/or other partners’ sole Intellectual Property. This LOA does not confer any right on the use of IRRI’s and/or other partners Prior IP.

iii. Either Party may provide permission, upon request and with consent from all other partners, for the use of the results of the collaborative research for the following purposes:

- a. for non-commercial research conducted by public sector organizations (“Research Exemption”); and
- b. for use in the event of a national or regional food security emergency limited to the duration of the emergency (“Emergency Exemption”).

iv. It is understood and agreed that research materials and/or IP developed through this LOA may not be used for commercial activity, unless all partners give its prior written approval.

ARTICLE 5 - CONFIDENTIAL INFORMATION

Confidential information shall be identified by mutual agreement of all Parties. All confidential information shall be protected in accordance with applicable laws in the territory of the State of each Party.

Confidential information may be disclosed to the third party under written mutual agreement of both Parties.

The protection of Confidential Information hereunder does not and shall not extend to any information, which it can be proven by the disclosed Party upon written request of the disclosing Party that the disclosing Party is legally obliged to disclose by reason of any law, regulation, rule or other requirement of any government or any agency or department , the Official Information Board under the Official Information Act B.E. 2540 provided always that the disclosing Party is given prior warning of such disclosure and the said Party shall use all reasonable effort to minimize such disclosure.

ARTICLE 6 - CROSS WAIVER OF LIABILITY

With regard to the activities undertaken pursuant to this Agreement no Party shall make any claim against another Party or the other Party's Related Entities (e.g. contractors, subcontractors, etc.), with respect to injury or death of its own employees or employees of its Related Entities, whether such injury or death arises through negligence or otherwise, except in the case of gross negligence and willful misconduct.

In addition, each Party shall extend the cross-waiver of liability above to its own Related Entities by requiring them, by contract or otherwise, to waive all claims against the other Party, Related Entities of the other Party, and employees of the other Party or of its Related Entities for injury or death arising from, or related to, activities undertaken pursuant to this agreement.

Notwithstanding the above, this cross-waiver of liability shall not be applicable to:

- (a) Claims between a Party and its own related entity or between its own related entities,
- (b) Claims made by a natural person, his/her estate, survivors, or subrogees for injury or death of such natural persons,
- (c) Intellectual property right claims.

ARTICLE 7 - ENTRY INTO FORCE AND TERMINATION

This LOA shall enter into force on the date of its signature of all Parties and shall remain in force until April 30 2017 subject to availability of funds.

This LOA may be terminated at any time by giving written notification to the other Parties at least three (3) months prior to the date of termination.

IN WITNESS WHEREOF the Parties have caused their duly authorized representatives to execute five originals of the LOA in English language, each copy of the text being equally authentic.

For IRRI

(Dr. Matthew K. Morell)

Director General

Date: _____

For RD

(Mr. Anan Suwannarat)

Director General

Date: _____

For GISTDA

(Dr. Anond Snidvongs)

Executive Director

Date: _____

For DOAE

(Mr. Somchai Charnnarongkul)

Director General

Date: _____

For sarmap

(Dr. Francesco Holecz)

Chief Executive Officer

Date: _____

Annex 1 Project document

(Attached)

Annex 2 RIICE Phase II budget information

Table 1 Funds provided by IRRI to Thai partners in USD

Partner	May 2015- April 2016	May 2016- April 2016	Total per partner
Rice Department of Thailand	57,469	35,744	93,213
Geo-Informatics and Space Technology Development Agency	19,122	18,022	37,144
Department of Agricultural Extension	13,300	12,656	25,956
Total per year	89,891	66,422	156,313

Table 2 Thai partners' in kind contributions in USD (staff time, office, materials, etc.)

Partner	May 2015- April 2016	May 2016- April 2016	Total per partner
Rice Department of Thailand	85,200	79,000	164,200
Geo-Informatics and Space Technology Development Agency	91,955	38,355	130,810
Department of Agricultural Extension	73,187	19,906	93,093
Total per year	250,342	137,261	388,103



Workshop documentation



**Workshop organized by
RIICE in cooperation with FPO and BAAC**

“AREA YIELD INDEX INSURANCE PILOT 2016”

**22th January 2016
Swissôtel Nai Lert Park, Bangkok**

Content of the workshop

1	Background and objectives of the workshop	2
2	Programme of the workshop	3
3	Feedback by participants and next steps	3

Annexes (provided in a separate document)

Annex 1: List of participants

Annex 2: Overview of RIICE achievement Phase I and outlook Phase II, Michael Anthony (sarmap)

Annex 3: Overview of the area yield index insurance pilot 2016, Susan Gille (GIZ)

Annex 4: Remote sensing -based yield modelling, Dr. Tri Setiyono (IRRI)

Annex 5: Area modelled yield index insurance product, Peter Book (Allianz Re)

1 Background and objectives of the workshop

The Government of Thailand is providing protection to its rice farming constituency through the Government Disaster Relief scheme since 2004 which is being expanded through an Insurance top-up scheme since 2011.

Since 2012, the RIICE project (“Remote Sensing Based Information and Insurance for Crops in Emerging Economies”) has engaged with different Thai stakeholders regarding opportunities for the **improvement of the current Thai rice insurance scheme with the vision in mind to make it financially viable, politically stable and technically sound**. A big stakeholder workshop in 2014 in which challenges and the way forward for the Thai crop insurance scheme were discussed, laid the foundations. RIICE is a consortium consisting of five different partners (SDC, GIZ, IRRI, sarmap and Allianz).

At the same time RIICE has also been providing capacity building to Thai partners, i.e. several departments of MoAC and the Thai Space Agency GISTDA to **use remote sensing technology and to link it to a sophisticated crop yield modelling technology** in order to build a rice production monitoring system which provides accurate and timely information on rice areas, yield, and disaster affected rice areas.

The Fiscal Policy Office is aiming at expanding and strengthening the current Thai rice insurance scheme. At the end of 2014, FPO and GIZ (on the behalf of the RIICE project) signed an agreement under which RIICE is supporting the Thai stakeholders in finding a solution how to improve their current rice insurance scheme. Under the umbrella of this agreement, **FPO mandated RIICE to provide support in studying the feasibility of a satellite-supported area yield index insurance scheme**. It has been agreed that RIICE would facilitate the organization and implementation of an area yield index insurance pilot in selected districts during the main season 2016. Several pre-discussions with FPO, BAAC, Thaivivat have been taken place in 2015 resulting in the proposal that the proposed area yield index **insurance pilot will be undertaken in the two selected provinces Suphanburi and Ubon Ratchathani in the main season 2016 in order to study the performance of the product and related design, distribution and claims assessment processes on a real-case basis**.

The objective of the stakeholder workshop “Area Yield Index insurance pilot 2016” was **1) to inform all stakeholders** involved in the Thai crop insurance scheme on the planned area yield index insurance pilot and **2) to provide a platform for discussing key elements** and finding a common understanding on the roles and responsibilities in the implementation of the pilot in the main season 2016. Participants of the workshop included FPO, BAAC, OIC, Thai Rice Department, DoAE, OAE, Thai GIA, Thaivivat, Allianz CP, Aon Benfield, Swiss Re, RIICE partners (IRRI, Sarmap, Allianz Re, GIZ).

The workshop in particular focused on:

- Inform all involved stakeholders on the planned insurance pilot
- Seek common understanding of the roles and responsibilities amongst the stakeholders
- Clarifying requirements of the pilot (e.g. subsidies, regulatory issues)
- Discussing product features and operational issues
- Receiving feedback from insurance Pool and reinsurers

2 Programme of the workshop

Time	Topic	Responsible
08:30-09:00	Registration	
09:00-09:15	Workshop opening speech, introduction and background and aim of the insurance pilot	Dr. Mahatana , FPO
09:15-09:25	RIICE team introduction	Dr Suriyan Vichitlekarn, GIZ
09:25-09:40	Overview of RIICE achievement Phase I and outlook Phase II	Michael Anthony, RIICE (sarmap)
09:40-10:20	Overview of the area yield index insurance pilot 2016	Susan Gille, RIICE (GIZ)
10:20 -10:35	Coffee break	
10:35-11:20	Yield estimation using satellite data incl. Q&A	Tri Setiyono, RIICE (IRRI)
11:20-12:30	Proposed insurance product design and features incl. Q&A	Peter Book, RIICE (Allianz)
12:30-12:40	Recap of morning session and questions	Dr Suriyan Vichitlekarn, GIZ
12:40-13:40	Lunch break	
13:40-14:10	Discussions and Q&A	Dr Suriyan Vichitlekarn, GIZ
14:10-14:40	Operational issues incl marketing, distribution and data flow	Jittima Chaimuanwong, RIICE (GIZ)
14.40-15.10	Open questions and discussing of next steps	Dr Suriyan Vichitlekarn, GIZ
15.10-15.30	Workshop closing and group picture	Dr Suriyan Vichitlekarn, GIZ

3 Feedback by participants and next steps

Feedback and comments by workshop participants

The presentations (please refer to the annex) were followed by lively and intense discussions amongst stakeholders who welcomed the opportunity and reconfirmed their commitment in implementing the insurance pilot at the one hand but also raised concerns and identified potential limitations for a successful implementation at the other hand. Main points raised by the participating institutions were as follows:

FPO explained in their opening statement the need for a significant **improvement of the current disaster risk financing strategy for farmers** which includes the disaster relief and the top-up insurance scheme. FPO plans to revise the current scheme set-up to achieve more efficiency and expand the outreach to a much bigger scale. The **planned area yield insurance pilot** serves as an opportunity to address shortcomings of the current set-up and to study the performance of the product and related design, distribution and claims assessment processes on a real-case basis.

BAAC re-confirmed their commitment to partner and support the idea of undertaking an area yield insurance pilot. BAAC sees this pilot as an **opportunity to address key challenges of the current scheme**. The importance of support and BAAC staff training in awareness raising and outreach to farmers is of key concern to BAAC.

Dr Apichart (former DG MoAC) noted that the collection of yield data needs to be further improved. MoAc and related agencies would like to see **the potential and empirical evidence how the described technology can help in improving data collection and rice production monitoring as well the existing crop insurance scheme**. He stressed that an efficient crop insurance programme would help the Thai Government to reduce its budget uncertainty.

Thai GIA stressed the **importance of a political will** and the need for a continuous leadership of the Government in revising the current scheme set-up and testing other potential products such as the area yield index insurance. The private insurance market needs a strong and clear signal from the Government otherwise they would hesitate to participate in this initiative. Remote-sensing technology will doubtless play an important role in the future of crop insurance.

Thaivivat followed TGIA by advocating for a **need for government leadership** in setting the framework for this insurance pilot and coordination amongst stakeholders. They confirmed their interest in supporting this initiative and underlined the important role of BAAC. They emphasized that **an official, authorized yield should be defined by a government authority** rather than the project or the insurers to avoid that different yield results exist and are communicated to farmers (through the two products sold in parallel) at season end.

The **regulator OIC** confirmed a **need to approve the policy wording** for an AYII product.

Allianz Re suggested that the modelled yield system incorporating remote sensing data could be used for **determining losses within the existing disaster scheme**. The methodology is already used in countries like the Philippines to assess yields on an area basis. They explained that it is imperative that the claim determination and the official yield follows the modelled yield methodology to avoid different bases of claims settlement.

Swiss Re stressed the **decisive role that technology will play in the near future** in crop insurance schemes around the world. The **big leap forward that is planned in Thailand with an increase of 1.5m rai insured to 10m rai insured** can only be achieved with committed efforts by all stakeholders. Looking at the experiences from the Indian area-yield index insurance scheme which is the biggest in the world in terms of farmers, **area yield index insurance is a step forward in terms of reliability, objectiveness and transparency but also comes with limitations**. Each country needs to define an individual design and set-up of its insurance scheme for farmers based on the country conditions. The extent to which technology will be the basis of the scheme needs to be defined (e.g. inherent in the product design or only for cross-checking). It is **important to test the technology in form of a pilot to make such decisions**. Swiss Re also emphasized from their experience that **consistent and continued commitment from the Government in form of coordination, leadership and also subsidies** is a precondition for a successful crop insurance scheme.

Next steps

Suriyan Vichitlekarn (GIZ) summarized as **next steps** to be taken, that a **small working** group with a representative from FPO, BAAC, Thaivivat and GIZ will be formed to work out details of the planned insurance pilot and prepare for a “business plan”-type concept (including policy pricing and wording, assumed number of insured, distribution plan). The results of this working group will be regularly fed into the **National Technical Working Group on Crop Insurance**. The need for a **clear guidance by the Government** was raised by several participants and will be taken up by GIZ in direct consultations with FPO. **Policy wordings** and other required documents will be submitted to OIC for approval as soon as possible. GIZ and BAAC will **further detail a marketing and distribution plan** with assumptions on potential sales in the selected districts and investigate options to increase marketing activities at BAAC branch level and via Community Rice Centers GIZ-BRIA is closely working with.

The workshop has helped to clarify aspects of the planned insurance pilot and its operational challenges. It also delineated roles and responsibilities of participating stakeholders and identified important challenges which need to be addressed prior to the roll-out.

GIZ on behalf of RIICE is aiming to improve food security by establishing a rice production monitoring system through the use of remote-sensing technology linking it to enhance the efficiency and transparency of crop insurance solutions. We hope that we can assist Thai government to institute an insurance mechanism that reduces the vulnerability of rice farmers from natural catastrophes. We would like to thank all participants for their important contributions.

Hope to see you again.

GIZ on behalf of RIICE

