

OrganoRice

Minutes of the internal meeting

6th and 7th of November 2024

Project Report

In this document we report on the project progress by summarizing shortly the presentations provided by the individual group. Where necessary additional information from other activities such as the interviews from DARDs and LotusRice has been included to provide full detail of knowledge for all partners.

General Information

Khoi and Lutz reported on current project status. We currently have 3 growing seasons of data from fertilization, pest control and variety trials. In the 2 first growing seasons the varieties have been changed as this is also common practice by farmers. In the 3rd season variety TNN91 has been grown as this seems to be the best suited variety in the trials. Same holds for the fertilization. In the first 2 growing seasons fertilization in the pest control and variety trials was according to farmers practice and changed in the 3rd year to the best practice determined by the fertilization trials. The field experiments are secured for the next 2 growing seasons, whereby TNN91 and best fertilization will be applied.

From actual data gathered so far, we can already recommend best practice for trials but also for implementation but the next 2 growing seasons need to verify the recommendations.

Vinh Long Province

Extending the organic model in Vinh Long (cooperative) seems to be difficult and Khoi had many discussions with the farm manager to convince for transition of 30 ha but working with the cooperative seems to be quite difficult. As a consequence, Khoi stopped the cooperation with the cooperative.

Reasons are monetary and even including the local DARDs did not help in the discussion. Here it has to be noted, that the cooperative now consists of 2 cooperatives one for the organic 30 ha and another one for the conventional farming, whereby both are ruled by the same manager.

An Giang Province

In An Giang, we had the agreement to convert 2 ha which should be enlarged to 8 ha after the first year. LotusRice requested all farmers (~30) to start transition to ensure a sufficient large area of organic rice production to avoid contamination from conventional fields. Unfortunately, not all farmers agreed to start transition, and therefore, the size stayed too small for permanent organic rice production and also the DARD recommended not to follow up at this area. As an alternative, CTU identified another farmer which will convert 7 ha to organic by implementing in a first step safe rice (VietGap standard). The fields are part of a cooperative which showed willingness for transformation and also we do have the DARD support.

Dong Thap Province

In Dong Thap we have the support from the DARDs and safe rice is currently what is envisioned in the buffer zone adjacent to the national part. Joachim reported that pesticide use has there been reduced by 50% already. There are also smaller areas which will be transformed to organic rice production and 10 ha will be transformed.

Stakeholder engagement

LotusRice is still on board and shows willingness to support the project but currently they do not know how much yield loss they expect during the transformation process hindering large scale expansion as they need to compensate the farmers. Additionally, current rice prices between high quality rice (fragrant rice, or medical rice) and organic rice do not differ much and even rice prices for conventional rice are still high taking off the pressure on farmers to look for alternative production systems. LotusRice reported that they pay 40-50% higher prices for high quality organic rice compared to conventional standard rice but it seems that the current income of farmers is high enough to avoid the risks of transforming to organic production.

Control Union suggests to use mineral fertilization during the transition as an additional fertilizer besides organic fertilization to avoid large yield decrease, whereby the use of mineral fertilizer should be stepwise reduced to zero at the point of certification. This practice can be applied as the main target for certification are pesticides and their residues in the soil and product.

Safe Rice Concept

The concept of *Safe Rice* is that the product needs to be free of pesticides. This concept was formerly known as VietGap or GlobalGap. Background is that traders need to prove pesticide free products if they want to enter the US or EU market, especially in the high price segment as the large commercial enterprise request for pesticide free products. Commercial enterprise will test the products before marketing putting pressure on Vietnamese traders but also farmers.

High Quality and Low Emission Rice

The MARD launched a strategy from December 2023 on to convert 1 Million ha of rice to high quality and low emission but detailed information what the low emission means is unclear.

Reports from the different working groups

Here the major findings, problems and challenges are summarized. The full set of slides from the individual presentations can be found [here](#).

Fertilization Trials

Fertilization trials were performed in the glasshouse and fields. At Vinh Long fertilization trials were performed in combination with Si-fertilization but it seems that Si-fertilization reduces plant available N and P. This problematics need to be confirmed in the next 2 growing seasons. In general 6 different fertilization treatments have been tested and best fertilization practice has been implemented in the 3rd growing season for the pest control and variety trials.

There has been a quite large Corg difference measured between Si and non Si fertilization trials which cannot be explained by the Si treatment of differences in plant growth. Therefore, Corg will be measured again from fresh samples assuming that the Corg content did not changes much even after different fertilization treatments as the background Corg dominates the total Corg. Also the plant available P differs between Si fertilized and non-Si fertilized plots. Reasons need to be explored.

The greenhouse fertilization trials have been performed and samples will be taken back to Germany for analysis.

Variety Trials

In total 7 different rice varieties (3 high quality, 3 functional, 1 control) have been tested on the experimental field in Vinh Long, whereby fertilization

was performed the first 2 growing seasons according to the standard farmers protocol and in the 3rd growing season according to the model proposed by the fertilization group. The variety trials will be repeated for the next 2 growing seasons as we do see seasonal differences in yield. The data gathered so far show substantial yield differences between varieties, whereby variety TNN91 has been identified as best variety and has been used in the 3rd growing season also throughout all experiments (fertilization and pest control). We recommend to calculate total revenues for the farmers for the different varieties also including seed prices, market prices and inputs/labour.

Rice Quality

The rice quality group analysis different parameters of the rice varieties tested and also assists in the measurements of rice quality after post-harvest (storage). The high quality rice varieties show a high amylose content and based on the yield and chemical assessment variety TNN91 has been identified as the line to be used from growing season 3 onwards in all experiments. Japonica (Vin16) showed also high amylose content, which is quite surprising for a standard rice variety.

Antioxydants are mainly found in the unpolished rice and highest in red and black rice.

A proposal for a DAAD scholarship has been submitted in September by Tam to pursue a PhD at Bonn University in the Food Quality Group. Decision will be made in early 2025.

Post Harvest

The post harvest groups studies the best storage conditions after harvest using lab experiments (in a cooling cell). Therefore, storage at different ambient temperatures (10, 20 and 25°C) have been performed and the rice quality determined. Currently data only form short storage are available as quality assessment is quite tedious but longer storage impact will be determined too. Next to ambient temperature, rel. humidity, and light are recorded automatically during storage by sensors.

The data gathered so far (4 weeks of storage) do not show and trend in rice quality irrespectively on different storage conditions, which is a good result, whereby changes are expected after longer storage.

Plant Protection

For *weed control* the use of Azola seems a promising approach as it surpasses weeds and can be used as an additional N and Corg source for the next growing season. The combination of

hand weeding and Azola is the best practice found so far and will be recommended. Hand weeding is important for high yields (30 days after sowing).

There has been no strong *golden apple snail* (GAS) in the last spring season but large infestation in the summer/fall season. Dugs are released 7-10 days before seeding and *D elliptica* extracts sprayed at DAS 7 to reduce GAS. There seems to be a problem that there is not always enough time between seasons to release dugs on the fields and as an alternative the plant extracts are recommended. Water level maintenance at 2 cm or below can also help to reduce GAS pressure. Maintaining the water level low contradicts somehow the best weed control for which the water level should be maintained at 3-5 cm.

An economic evaluation of the costs for hand picking of GAS and the higher yields has been performed already and turned out to yield double price compared to conventional GAS treatment.

For *insect control* the experiments have shown that brown grasshoppers can be efficiently controlled by plant extracts. Same holds for all other insects (stem borer, leaf folder and army worm). There has been strong differences found between the abundance of natural enemies between treated and non-treated trials likely due to small experimental field sites and small distance between treated and non-treated plots. Application for insects should be performed 30-40 day after seeding and for stem borer 60-70 days. In general the control measures (spraying) should be only applied when necessary to avoid affecting natural enemies, which means that the farmers need to be trained rigorously.

For *plant disease* (leaf blast, grain rot) different plant based products have been tested at different application times. Both diseases could be tackled efficiently and yield was somehow as those in the control (not treated). In contrast, sheath blight control failed in the spring season 2024 and the solution would be also to spray using a biological pest control substance. Also during the 2024 fall season sheath blight infection stayed high and remains a problem.

Remote Sensing and Hydrology

The remote sensing group has published a first paper on land use classification in the MKD. Currently, they prepare a next round for questionnaires looking at irrigation and pest control in non-rice systems in Vinh Long. Nick will train students next days. Next steps will be the irrigating channel and water pathway delineation.

Pesticide and heavy metal monitoring

The results from the heavy metal screening in Vinh Long showed that there is no critical heavy metal contamination in the field. The samples from Dong Thap are prepared and will be measured soon. Rice samples have been also measured and do not contain any heavy metals either. Pesticide analysis showed some high concentrations of tricyclazole and isoprothiolanein the soil vom Vinh Long taken at the organic certified fields and also in the conventional fields. Both pesticide were also found in rice (organic and conventional). Samples from the field trials are in the processing and data will come soon. Currently, the data from the interviews are evaluated but more interviews from none-rice farmers need to be gathered and will be taken by CTU students until end of 2024.

Socio economics and market (Dung CTU-6)

A literature review was performed on consumer perception and behaviour. The group asked to provide the review for posting on the homepage and further use. Additionally, a first round of consumer survey was performed asking for perception of consumers. As India stopped the export of rice prices already dropped down (but stabilized at relatively high level). Nevertheless, it is expected that farmers do see again the chance to transform to organic production to stabilize or even increase income. German partners request for providing master thesis and reports to avoid double work and to build our conclusions on full data gathered.

Socio economics (FZJ)

A list of recommendations for spraying (per season with exact dates) should be provided by DARDs as this would be helpful to connect to the pesticide interviews and the application clock of Joachim. Joachim also suggests to contact the DARDs if they are interested in a TV broadcast where the major findings of the OrganoRice project can be presented.

Socio economics (FZJ)

Goia requested an update of available data from all project partners as UNU will need an overview of all data for the Multi Criteria Evaluation (MCE). Hereby, all data provided need to be documented and a readable format. For the MCE gathered and provided data need explanation also what they mean as this is beyond the capacities of UNU. We also should have in mind that all data have o be published at the end of the project (request from BMBF). Any data which can be traced back to individuals need therefore be 'manipulated' to avoid back tracing to individual farmers or fields. Nick and Linda have been already in contact with KIAG to find a solution for that.

KIPUS, and E-Diaries

An example what is already in our database (diagrams) should be presented on our homepage to give examples of application of the data. The KIPUS system can be also used to get information which might be suitable for any kind of publication in the project. We also should think about publishing a data paper referring there on the KIPUS system. Linda and Nick have been already in contact with KIAG to evaluate possibilities.

OrganoRice Workshop 2025

We plan to organize an international workshop on organic rice production in the first week of **2025 (3-7 November)**. Please already save the date. Work shop will be likely over 3 days starting mid-day first day and finishing mid-day last day to facilitate travelling for domestic participants. There will be also an excursion after or before the workshop.