Which future for agriculture in Prachinburi Province?

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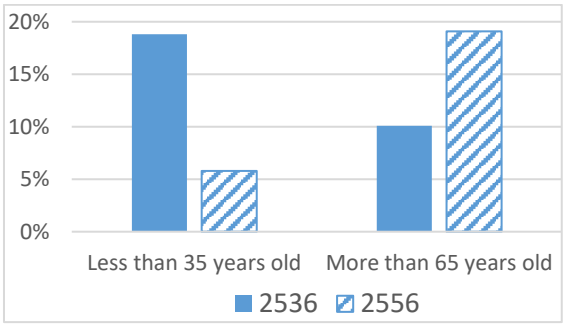
In the western part of Prachinburi Province, farmers have adapted their farming to local constraints, such as the frequent floods or the occurrence of brackish water in Prachinburi River during the dry season. However, especially in the rice sector, these constraints impede the evolution towards farming systems that can be sufficiently profitable to attract young farmers. The Doubt project aims to characterize opportunities to face these challenges and to identify scenarios for a sustainable agriculture.

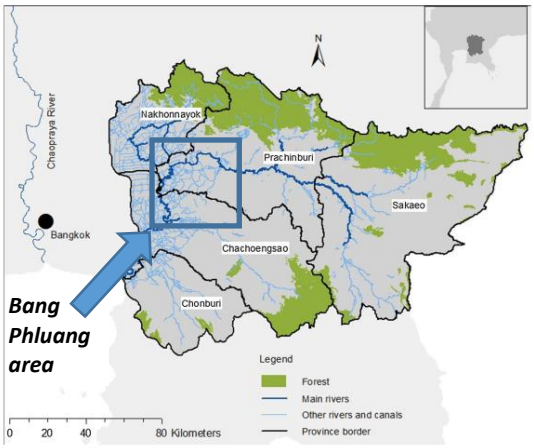
Thai agricultural sector is facing several challenges nowadays. Many farms face problems related to ***water (droughts, floods)*** and ***limited profitability***. These problems have been present for many years and are still acute nowadays. On top of these challenges, an increasing one is the issue of the ***ageing farming population***. As the following table shows, there are less and less young people and more and more elder people in the farming population of Thailand.



Percentage of young and old people among farmers (source: agricultural census)

The Cirad French Research Institute and the Thai Water Partnership Foundation have initiated the DOUBT research project[1] in Prachinburi Province to support thinking with local stakeholders about what may be scenarios for sustainable farming systems, giving these interrelated challenges in terms of water management, economic profitability and ageing farmer population.

The research focuses on the Bang Phluang area, situated in the western part of Prachinburi Province, which is a key interface zone: downstream, water in the Bang Pakong River is often brackish and farmers mainly grow shrimp and fish. Upstream of this area, water remains fresh and farmers produce mostly rice.



The Bang Phluang area (Source : Kupkanchanaku and coauthors, 2015."Integrating Spatial Land Use Analysis and Mathematical Material Flow Analysis for Nutrient Management: A Case Study of the Bang Pakong River Basin in Thailand.")

[1] The DOUBT project (2560-2562) investigates the dynamics in place in the Irrawady delta in Myanmar, the Chao Praya and Bang Pakong deltas in Thailand and the downstream part of the Mekong River in Cambodia. It involves various European and Asian academic institutions. In Thailand, it involves mainly Cirad and Thai Waterparnership. For more information, contact Kassirin Phiboon (08 99 97 66 98, kassirinp@gmail.com).

Different farms – different challenges

In 2560, 108 farmers were surveyed in four Tambons of the Bang Phluang area. The surveyed farmers can be separated into four types.

Farm type	Average age (year)	Average farm size (rai)
Farms that produce only rice, no machines	57	36
Farmers that produce only rice and have machines	54	78
Farmers that do mixed fish and shrimp farming	50	24
Farmers that produce rice and shrimp	49	60

A first type encompasses farmers that mainly ***produce rice and have not invested in machines*** (tractors and harvesters). Some of these farmers grow other crops or have fish ponds, but on very small areas and mainly for home consumption. Farmers of the second type mostly ***produce rice and have invested in a tractor***, and in rare cases also in a harvester. Their average farm size is more than double the one of the first type. The third type groups farmers that produce ***fish and shrimp*** together. Since shrimp farming requires investments on land (digging the pond, equipments, etc.), these farmers own most of the land they use for shrimp production. The last type groups a small number of farmers who produce ***both rice and shrimp***.

These four types represent most of farms in the Bang Phluang area – though other types of farm also exist, such as some focusing on orchard production.

Water-related problems

In Bang Phluang area, farmers get irrigation water thanks to a network of canals connected to Prachinburi and Bang Pakong Rivers. Occurrences of brackish water in the river have become increasingly frequent during the dry season in the past 15 years, especially during March and April. This has been due to increased water demand, especially because farmers started producing dry season rice. Farmers have adapted at individual level by growing short-duration rice varieties, that can be harvested before March. At collective level, in February, water is pumped in canals that are used as a storage facilities and then, when water in the river becomes brackish, the gates connecting the canals to the river are closed and no more water is pumped into canals, usually till June. Since gates are closed, farmers may sometimes face shortages of water during this period. Sometimes also, farmers plant dry season rice late and do not manage to complete the irrigation cycle before water becomes brackish. In total, ***52% of interviewed farmers consider that they face problems related to brackish water but only 11% consider that this problem affects crop yields or production of fish and shrimp***.

Moreover, floods occur frequently during the months of October and November. Most farmers have adapted by harvesting rice or finishing a shrimp or fish production cycle before the flood period. Some fish and shrimp farmers have installed nets on the boarders of the basins or they have collectively built small dykes around the basins. In one of the subdistricts, the Tambon administration pump water out of the canals to the river. Most farmers declare that they are usually not affected by floods.

Farming practices

Many rice farmers externalize part or all of agricultural activities. Among the farmers producing rice, 77% do not plough by themselves, and 96% do not harvest by themselves, mostly because they do not have the machines. Moreover, approximately two thirds of rice farmers also use labor for sowing seeds, spraying chemicals and fertilizers. Reasons given are: 1) lack of available family labor during peak periods; 2) health concerns for spraying pesticides; and 3) farmers' old age. Hiring labor has a consequence on profits, since payment of external labor and of machine operators represent approximately half of production costs.

Farmers' plans for the future

Farmers involved in the most profitable activities per rai (shrimp and mixed fish and shrimp farming) generally either plan to invest in their existing farming systems or have no major plans for change because they were generally satisfied with their farming systems. Almost none of the farmers producing rice only contemplates to invest more in their farming systems. They consider that rice production has limited horizons for development, due to low rice prices and lack of identified opportunities for a major improvement in farming practices.

Surprisingly, rice farmers with machines do not express a plan to go on expanding the rice cropped area. A bit less than half of farmers producing rice only aim to diversify, i.e., to start farming new crops such as vegetables and orchards and fish farming. Among them, 40% farmers want to do it mainly for home consumption, following the policy of "self-sufficiency economy". The other 60% want to be able to sell the new productions. None of the farmers producing rice only are interested in shrimp farming because of the high investment costs required, lack of knowledge of the production techniques and markets, and because of the risks involved. The other half of rice farmers have no plans because they consider their margins of maneuver to be too limited.

Constraints to change

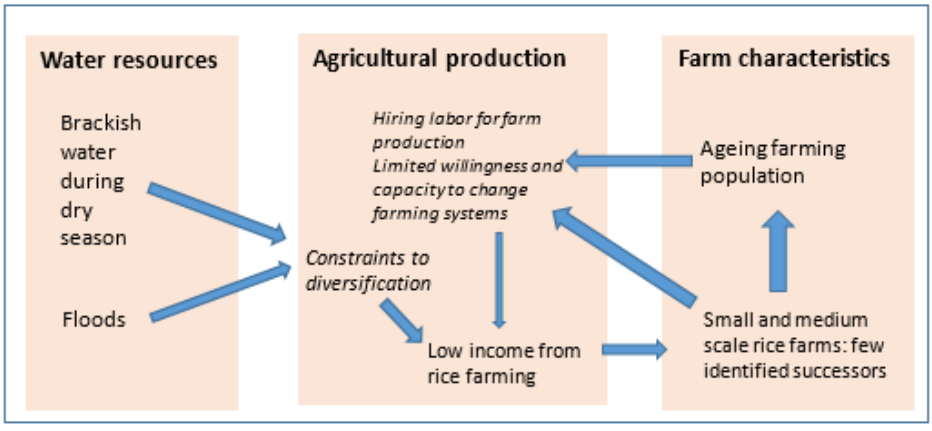
Two main constraints limit opportunities for change in farming systems. First, the ***occurrence of brackish water and floods*** limits investments in more profitable crops, such as orchards and vegetables. Farmers may attempt to deal with floods by planting in lands situated in upper parts (if they have some) or buy building dykes. Farmers can attempt to deal with brackish water by digging ponds in which they store fresh water. However, these investments can be very costly and none of them can provide a guaranteed solution to the problems of brackish water or floods. The Huay Samong Dam, situated in the upper part of the Prachinburi River Basin, started operating in 2559. Thanks to this dam, floods were more limited in 2559 and releases from the dam in 2560 enabled to maintain low levels of salinity in Prachinburi River during the dry season. However, the planned development of an irrigation scheme just downstream of the Huay Samong Dam and of industries situated upstream of the study area, may lead in the future to the reappearance of brackish water events in Prachinburi River during the dry season.

Second, ***almost half of rice farmers without machines are sure that they will not have a successor within the family***. The main reason was that their children are not interested in taking over the farm. Rice farmers with larger farmed areas are more likely to have an identified successor (only 4 of the 22 farmers who farmed more than 54 rai have no identified successor). This percentage of farmers who know there will be no successor within the family is much lower for farmers engaged in shrimp or mixed fish and shrimp farming. Aged farmers that know that none of family members will take over the farm have limited incentives in investing and making strong changes in their farming systems.

Young people that are children of farmers often compare the income they can expect from farming with the one they could get in cities, as one criterion to decide whether to work in cities or to stay in rural areas. This criterion is just one among many others, such as the opportunity for increases in income, the uncertainty of incomes, the quality of life, the autonomy, etc. If we focus on this economic criterion, – in very rough terms - young people may expect to earn 6,500 baht per month from working in factories (8,000 baht of wage minus 1,500 baht for lodging). This calculation is obiously an approximation, because other costs may be involved (transportation, etc.). Young people may consider whether they would earn at least this amount if they take over the farms of their parents. In surveyed farms, ***only one third of farmers that produce rice only generate an income that is above this threshold.***

Key lessons

Farms in irrigated areas of Prachinburi Province have designed production systems that have enabled them to adapt to a large extent – but not completely – to constraints related to water resources.



Fish and shrimp farmers generally make profits and most do not want to implement major changes in their systems –though they also face specific issues, such as unstable market prices. The most fragile farms appear to be the ***smaller rice farms without machines,*** which are caught ***into a vicious circle of low profitability, lack of identified successor, ageing farmers' population, and limited capacity to invest and innovate***.

In 2558, the government has launched the "large-scale schemes" program. Groups of farmers are invited to work together and in partnership with public institutions, for the production and marketing of one specific crop (or animal). The aim is to achieve economies of scale so as to decrease production costs, and to collectively negotiate better prices. Public institutions are called to act in a coordinated way to support these groups. In the frame of these development projects, farmers should receive some small equipments, they will have the opportunity to attend more trainings organized by the various divisions of the Ministry of Agriculture, and they should receive some support to negotiate better prices for both inputs and for their own production.

However, these changes will require major changes at farm level, in particular it will require implementing practices that are more time-consuming and more knowledge-intensive. It will also require very active collective action for jointly negotiating prices of inputs and of harvest. The implementation of such major changes will be a challenge for already aged rice-producing farmers who have almost no experience of collective action for agricultural production and marketing.

Thinking forward

In the Bang Phluang area, each type of farms faces specific issues that have to be dealt with to improve their systainability. In particular, breaking the vicious circle in which small rice farms are caught may involve first helping farmers design farming systems that are more profitable. Apart from the above-mentioned "large-scale schemes" initiative, this may be also achieved thanks to diversification, but this will mean to better manage the issue of brackish water and floods, and thus actions both individually and at collective level. It will require also to achieve in the same time an engagement of young farmers, in order to stop the process of ageing farming population. This means to help young farmers set up on farms from which they will get an income that makes it worth not moving to cities.

In order to accompany the thinking about these challenges, the DOUBT research initiative aims to organize a participatory analysis of the opportunities of changes in agricultural activities, and in water management, and about possible evolution of farming systems and water management in the 10 years to come (i.e., by 2027). We aim to ***assess with local actors, how to achieve sustainable farming systems, from now till next 10 years, in the Bang Phluang area by means of jointly:***

- ***Getting sufficient water for farming activities***, in terms of quantity and salinity and successful management of possibly negative water related risks, such as flood;
- ***Ensuring farming activities that are sufficiently profitable;***
- ***Enabling the successful involvement of a new generation in farming.***

The DOUBT project will first characterize opportunities for improvement of farming systems and water management at local level, in partnership with local actors. Second, the project will assess the main on-going changes and the main forthcoming ones in terms of water resources and use in the Bang Pakong catchment and in the main value chains (rice, fish and shrimp). Third, various scenarios for the Bang Phluang area, by 2032, will be analyzed and compared in partnership with local actors.