



**PROJECT «NETWORK FOR AGRICULTURE AND RURAL DEVELOPMENT
THINK-TANKS FOR COUNTRIES IN MEKONG-SUB-REGION (NARDT)»**



Regional research

Agricultural innovations review in Sub-Mekong region countries

**Smart agriculture model at My Dong 2 Cooperative, Dong Thap
province, Viet Nam**

1. Introduction

The agricultural production makes a very important contribution to ensuring food security for the country and their family in Vietnam over more than 30 years. However, agricultural production in Vietnam is mainly small-scale and dispersed. Under the impacts of commercial agriculture and economic integration progress, this situation is facing difficulties such as hindering the application of scientific and technical achievements in irrigation, mechanization and especially digital technology. An important condition for the application of the advances of technology is that the production scale need to increase enough for high investment efficiency. Therefore, the Vietnamese Government encourages the development of a collective economy to take advantage of economic efficiency of large scale and optimal capabilities for the development of mechanization and the digital technology. Many provinces have built cooperatives and support investment projects for the cooperatives applying achievements of digital technology. One of the typical examples is the smart farming model at My Dong 2 Agricultural Service Cooperative in Dong Thap province. The rice fields of this cooperative are monitored by mobile phone. Watering and pest control are intelligently controlled, allow to reduce production costs and manual labor.

2. Model development

My Dong 2 Agricultural Service Cooperative has 108 members with a production area of about 570 ha. The main crop here is rice. Implementing the agricultural restructuring project in Dong Thap province, My Dong 2 Cooperative always focuses on finding solutions to improve product quality and reduce production costs for farmers. One of the solutions that the cooperative has paid special attention to in recent years is to take advantage of all the support funds from the locality and social mobilization sources to complete the in-field irrigation system, combined with solid construction. Electric pumping station according to 4.0 technology to help people stabilize production.

With the attention of the provincial leadership, in 2017, My Dong 2 Agricultural Service Cooperative carried out the construction of a system of electric pumping stations combined with infrastructure (canals, in-field traffic, electricity, smart irrigation systems) and equipment adapting to climate change, serving the 170-ha area of the cooperative. Mr. Tran Phuoc Sang - Deputy Director of My Dong 2 Cooperative said: "In the past, this area also had a pumping station, but the scale was small, not enough to meet the production needs of the people. By 2017, with the attention of leaders at all levels, more than 30 billion

VND had been invested to build infrastructure including canals, in-field traffic, electricity, smart irrigation system, which enable farmers to save water and reduce production costs”.

The combination of water level monitoring parameters, sensor tubes to control alternate wet and dry irrigation and pump control station makes it convenient for the cooperative to adjust the water level in the field. The electric pump station system consists of two pumps controlled by a sensor system, so the control station manager only needs to use a smartphone with an Internet connection to remotely control the pumping station system to supply water to the field in the right time. Therefore, it has helped to reduce 30% of water pumping costs by shortening the time. Specifically, if a normal pump takes 2 to 3 days to fill up the field with water, pumping with this inverter pump only takes 1-2 hours to ensure full water for 170 ha without farmers taking much effort. strength. Before, when this pumping station was not available, the pumping of water took a long time and was uneven among the fields. In the high fields, the water is not enough, while the low fields are flooded with rice, so the rice sometimes fails and sometimes hits. However, since having this pumping station along with the construction of canals, including laying water pipes for each field, people are actively in bringing water in and out. Along with the investment in the electric pumping station system, farmers the smart rice production process to reduce the amount of seed, use one-time fertilizer for a crop, reduce costs by 50% and increase profits.

Irrigation system at My Dong 2 Cooperative in Dong Thap province



Source: Vietnam Agriculture Newspaper.

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In addition to reducing the cost of irrigation, farmers whose fields are located in the pump system cover also enjoy many other benefits such as: thanks to the initiative in the water source, the weed situation is very few, due to simultaneous sowing and the same time. varieties, so it is easy to apply technical measures in rice cultivation such as "1 right, 5 decrease" (use of certified seed and 5 decreases including decrease of seed, fertilizers, water, pesticides and after-harvest losses), "3 decrease (seed, fertilizers, pesticides) 3 increases (productivity, quality, effectiveness". Since then, rice productivity has also been continuously improved. In addition, the harvest and sale of rice is also more convenient, because the entire internal surrounding dike system is closed, trucks can go to the field to buy rice.

Taking advantage of the large field, the cooperative has provided the service of sowing rice or spraying pesticides by drones for members to help reduce time and manual labor.

Equipment for sowing, spraying and pest control at My Dong 2 Cooperative



Source: IPSARD survey in Dong Thap province.

With Drone fertilization and rice sowing, each time the machine can carry an amount of fertilizer and rice seed from 40-45 kg with the amount of fertilizer used about 150 kg/ha/batch for rice, the machine only takes about 15 minutes, helping farmers save a lot of time compared to manual fertilizing. Pest monitoring equipment helps farmers know the density of pests in their rice fields so that they can request the cooperative to support spraying service by drone in time to reduce damage.

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With many modern farming methods implemented synchronously, the cooperative not only helps farmers to reduce production costs and reduce labor, but also improves productivity, with a rice yield of over 5,3 tons/ha or 1 ton higher than conventional farming methods.

3. Opportunities and challenges

The trend of applying high technology in agricultural production has always been of interest to all levels of government as well as production organizations in agriculture, especially with collective economic models such as cooperatives. Therefore, smart agricultural models at My Dong 2 Cooperative in Dong Thap province are a great opportunity for the development of Vietnam's modern agriculture, especially when technological equipment is interested by many businesses to produce with costs suitable to the economic conditions of Vietnam.

This is also a good opportunity for this model to participate in carbon reduction programs in agricultural production such as the 1 million hectares of high-quality rice export program in the Mekong Delta provinces, the SRP rice farming model., applying the Alternate Wetting and Drying Irrigation (AWD) method to reduce carbon emissions, etc.

However, this model requires certain conditions. Firstly, the scale must be large enough to be able to promote the superiority of smart technologies. Large investment is also a big challenge for collective economic organizations such as cooperatives with limited financial capacity. It is known that the current cooperative's smart farming system is mobilized from many different capital sources from the provincial budget, agricultural restructuring programs, VnSAT project, etc. with a value of about 32 billion VND.

4. Conclusion

The smart agricultural application model at My Dong 2 Cooperative in Dong Thap province is considered the most modern rice production model in the Mekong Delta region with outstanding features such as: controlling production by smartphone to monitor pests, spraying, fertilizing with Drones, remote control of irrigation pumps, mechanization of all stages of rice harvesting in the field. It has created fields without footprints. Farmers now work very well in the fields; their clothes are not as dirty as before. Cooperative has been taking care for cropping varieties, sowing time, and selling of rice. However, the expansion of the model requires the State's investment in field planning, the irrigation system as well as the development of the collective economy and the support of the people.

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