A Case Study:

"Weed Management and Water Shortage Solutions for Pepper Plantation - Case Study of Farmer Nutt Phi"

Prepared by:
HEKS Cambodia,
SmartAgro,
Cambodia Climate Change Alliance-Phase 3 (CCCA3)

Nutt Phi, is a farmer who lives in Memong village, Memot district, Tbong Khmum province. He is 48 years old and earns his living by cultivating plantations, growing a variety of crops including rice, cashews, rubber, and especially pepper that he has so far planted for a total of 1.400 poles. Through his 6-years pepper cultivation experiences, he shares pepper management challenges encountered on the farm. He has noted that pepper consumes much water and regular irrigation is required, especially in the dry season. He used to irrigate his pepper crops 3-4 times a week using a hose system connected to a pump from a pond, and each irrigation took between 30 minutes to an hour and used about 60 liters of diesel a month (3,500 riels a litre). In addition, if the temperature was very hot, more water was needed. **Nutt Phi** told that relying on water sources from wells to irrigate pepper crops was not working, and he had to pump water stored in ponds before using it for irrigation.

Figure 1: Weed management practices prior to project participation (weeding and chemical pesticides).

Due to continuous drought in the area, he and some other farmers had to increase the farm irrigation, and that put them at a risk of water shortage. Therefore, he spent extra money to deepen the well to store enough water. When there was not enough irrigation water, the pepper fruit didn't provide good yield and this required him to find other solutions to keep the soil moist in the field. He added that he used to use hay covering between pepper poles to prolong moist longer, yet this practice required more labor. During the dry season, he also spent money on weeding at least every two months, and this action took for two people for three to four days (the cost for a weeder is 25,000 riels a day). In addition, he sprayed (the cost of a sprayer is 50,000 riels a day and a bottle of pesticide is 40,000 riels) the grass once after the harvest every year. The total maintenance cost was about 2 million riels a year, not including the cost of fuel (1.3 million riels a year)[1].

*Figure 2: **Mr. Nutt Phi** (below) attends a demonstration training course for farmers organized by the project in Memmong village, in Memong commune, Memot district, Tbong Khmum province.*

1 60 liters a month costs is for 3500 riels and the use is for 6 months a year

In the beginning of the rainy season in 2021, Nutt Phi participated in a farmer field school on the use of cover crops organized by Climate Smart Farming Project (supported by the Cambodian Climate Change Alliance Phase III) implemented by HEKs Cambodia. At the field school different cover cultivation techniques were introduced to the participants. After the training, **Nutt Phi** has changed the maintenance practice of 300 poles of plantations for planting cover crops between pepper substrates to increase soil fertility for all weeds and maintain soil moist in the field.

Figure 3: HEK's farmer field school

During the first year of the cover crop practice, **Nutt Phi** noticed that the new practices helped to reduce water usage in the dry season. The soil stays moist for a longer time period when it is covered with cover crops, and farm irrigation can be reduced to one to two times a week with less water. He can irrigate well in just 10 to 20 minutes. Therefore, the use of diesel is about 30 liters a month for all of his pepper fields. He also observed that pepper changed the color of its leaves to darker green because of the sufficient soil moist for feeding the stems, and the new practice has also reduced the use of herbicides. In 2021, **Nuth Phi** received 1,700 kg of pepper from his 1,400 poles, and for the 2022 pepper harvest was 2,200 kg of pepper. He highlights that the increase in yield is due to sufficient moist, that makes the feeding of the stems better and the fruits heavier.

"Cover cropping plantation in pepper farm could maintain soil moisture, reduce weed and cost of pesticide, and improve the yield" told **Nutt Phi.**

*Figure 4: **Nutt Phi** is monitoring his pepper plantations*

However, he has also faced some difficulties and found out that the ground weed cover needs to be cleared before the cover crops to grow close to the ground. He had to remove all weeds by hand for 3 months before the cover crops covered the ground. He has seen the benefits from using the cover crops, including reduction in the use of pesticides, and water for irrigation. His community's farmers have already expanded the cultivation of cover crops. An additional 200 square meters (about 100 pepper's poles) of a land is next to be covered with cover crops.