

Case study of Mr. Sorn's legum-based cropping systems

Updated in Jan. 2019, Battambang, Cambodia



Mr. Chrech Sorn is a 68-year-old farmer living in Sdey Kraom village, Prek Loung Commune, Ek Phnom District, Battambang Province. He grows 1 hectare of vegetable crops and 2 hectares of rice fields. He cultivates the love for farming, especially vegetable cropping.

Mr. Sorn's farming background

He has been farming for 30 years. At first, he only owned a rice-field and he grew just 40 square meters of vegetables around the family home. Because of his love for the land, he decided to buy a land away from home, about 13 kilometers away, in the area flooded by the Tonle Sap. During the wet season, the flooded area cannot be cultivated. However, alluvial sediments and vegetal waste are dropped off on the topsoil when the flood waters receded, favoring soil fertility and allowing the area to maintain good yields.

When he began agriculture, he cultivated a single crop on the same land and used pesticides and chemical fertilizers. Despite its fertile soil, its soil began to deteriorate, and its yields dropped year by year, which increased its debt and prevented these children from continuing to go to school.

Sorn on-farm's observations

He started growing mung bean from 2004 because of market opportunities, but he soon found that crop yields of other crops were better in places where the crop was preceded by mung bean. Instead of planting the same crops in the same place like most of the neighboring fields, he began to changing crops in the same place, with regularly mung beans crop.

In the past four years, he has cultivated three main types of crops: mung bean, rice and watermelon. During the first year after the flood waters receded, he implement legume crop

rotation with rice. Mung bean crops improved soil fertility for the next crop, rice yielded higher yields, and Mr. Sorn spent less money on chemical fertilizer purchases.



Sorn's grandson harvesting mung bean, May 2018



Sorn's daughter harvests watermelon, June 2018

In the second year, Mr. Sorn has grown only one mung bean cycle, then left the land vacant without planting anything else. In the third year, he planted the mung bean crop, as in the previous two years, he then cultivated watermelons, then planted a short cycle rice. The yield of the watermelon was high. However, the rice sown after the watermelon crops had a moderate yield, because he thinks the watermelon to export a lot of nutrients. To date, he finds that his yield is increasing, so much so that other farmers are very interested in the success of his crop.

Training workshops on Organic Farming

Since 2008 to 2012, Village Support Group (VSG) NGO has trained and inspired him to make compost and diversify vegetable crop production. The compost trained with build a high shelter to protect compost, and build crib with wooden or bamboo, including layer of dry material, fresh material and layer of manure, maintain constant humidity, turn over the earth beside the crib, move the crib, and put it over the turned earth, fill the crib by turning over layer by layer.



The compost taught required to build a crib made of wooden or bamboo and that of a raised shelter to protect it. Farmer have to make the compost inside the crib by adding layers of dry material, fresh material and manure. It was taught to turn over the compost pile, by moving the crib beside, then turning over the compost layer by layer in the crib back on. In fact, Mr. Sorn

was the only farmer to have adopted this practice in his village for several years, especially because there is too high labor-intensive need.

In his case, Mr. Sorn had the strength to make a lot of compost and use it on several kinds of crops, such as chili pepper, watermelon, eggplant, cucumber, orange tree, mango tree, and on his rice field. Through the practice of composting, he was able to become familiar with the important of soil organic matter to maintain crop health.

Farmer-to-farmer study visit to improve cover crop adoption

Though a participative field study in 2017 implemented by Life and Soil NGO, he improved his understanding of his cropping system practices, in particular regarding the atmospheric nitrogen fixation by legume. That is allowed him to confirm its observation and to strengthen the planning of these cropping system, by implementing a systematic crop rotation. Currently, he is implementing a cropping system based on three-crop rotation.

This cropping system has been shown to be effective in maintaining soil fertility but has failed to restore degraded soils. In 2018, the so-called "ART" research group in partnership with Life and Soil NGO, identified his village as a target area in order to organize study tour in Mae Taeng District, Chiang Mai Province, Northern Thailand. Thai farmers have been using cover crops such as *Crotalaria Juncea* for several years to restore soil health in this region.



Mr. Sorn during a study tour in Thailand, August 2018

The farmers' demonstrations on the soil restoration process by cover crops seemed more understandable and interesting by the Cambodian farmers' group. Back in Cambodia, he decided to use cover crops to rebuild his degraded lands, producing a lot of biomass and increasing biological nitrogen fixation.

Currently, Mr. Sorn is implementing step by step continuous process to enhance soil fertility for maintaining stable incomes during the transition process. He decided to adopt cover crops. In 2018, Mr. Sorn sowed *Crotalaria juncea* on 1 hectare and shared seeds around him. At the beginning of the year 2019, he grows cover crops on 2 hectares, and cash crops on 1 hectares, and then he plans to set up gradually with rotation including *Crotalaria juncea* in all his cropland.

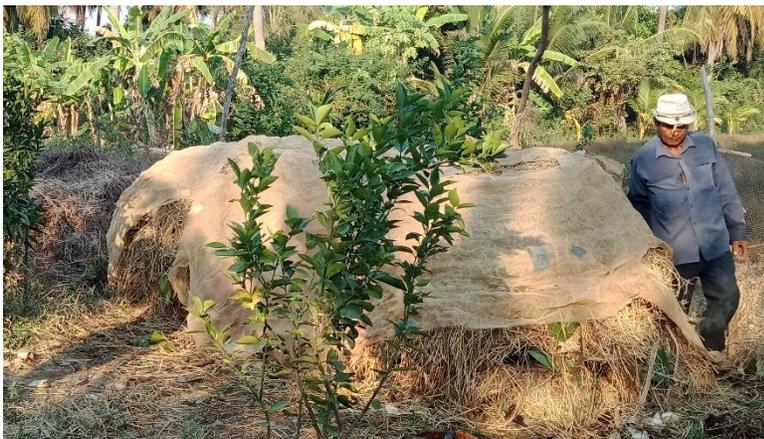


Sorn's cropland of *Crotalaria juncea*, Dec. 2018

Farmer-to-farmer study visits to improve composting adaptation

Mr. Sorn took part in a study visit facilitated by Life and Soil NGO at "Chamka Savotapiep Toamachiet" farmers' group in Sotnirkhom district, Siem Reap province, supported by GRET and CIRDA. After this farmers' exchange, Mr. Sorn has adopted his compost practice following the farmers' composting without crib and compost house, and adapted it to his needs. Indeed, Mr. has a surface of 3 hectares, so he needs more compost. To do this, it does not cut the raw materials, and increase the length of the compost pile. This big pile of compost requires 5 months to decompose completely.

Thanks to this adequate practice, Mr. Sorn not only makes more compost than before, but the other villages are interested in this practice and adopt it. Dissemination has started well, about ten villagers are adopting this practice.



Mr. Sorn's compost pile during a study tour in Thailand, Jan. 2019