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Agroforestry farmer field schools: informed farmers for sustainable landscapes

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Abstract

Most of agroforestry extension methods are modified from the methods developed in agricultural extension. Agricultural extension methods were mainly developed to enhance production of staple crops or short term crops with production cycle less than one year in more monoculture system. Meanwhile, the presence of perennial crops in agroforestry system requires more than 1 year to see the results of agroforestry extension programs. Also, the focus of agroforestry extension program is not only focusing one commodity as in agricultural extension but to optimize production of different crops under one agroforestry system. Thus, agroforestry extension need to focus more on equipping farmers with knowledge that can enhance their analytical skills in managing their agroforestry farms, and farmer field school is one of the extension method that facilitate the process of knowledge transfer on agroforestry. A two-way communication between farmers and extension agents in FFS facilitates the interactive learning process that enhance farmers' willingness to test technologies introduced through the extension program. Designing an Agroforestry Farmer Field School (AFFS) focusing on agroforestry farm management is expected to enhance agroforestry farm productivity. The objectives of the AFFS are to: 1) enhance farmers' analytical skills in managing agroforestry that support the sustainable landscape management; 2) provide innovative extension approach that enhance farmers' analytical skills and information networking; 3) utilize farmer demonstration trial and nursery as places to test and learn new agroforestry knowledge and technology; and 4) prepare expert farmers who will play role as agroforestry extension agents. Topics learned in the AFFS are linked to sustainable landscape management with main focus from germplasm improvement to garden management. Combinations of different extension methods are used in the AFFS, ranging from scientist-to-farmer, farmer-to-farmer, fieldsite visit and development of demonstration trials. The AFFS on agroforestry farm management was tested in Sulawesi, Indonesia under Agroforestry and Forestry project (AgFor) from 2013 to 2015. The implementation of AFFS have contributed to the enhancement of agroforestry' role as source of livelihood in sustainable landscapes of Sulawesi.

Keywords: *Agroforestry extension, Demonstration trials, Expert farmer, Sulawesi, AgFor*

Introduction

Agroforestry is a sustainable land management system that increases land productivity while providing environmental services through practices that are compatible with the local cultural context. Ecological, economic and social aspects of sustainable landscape are considered in agroforestry management. Low productivity of agroforestry system due to lack of access to agroforestry technologies and information made agroforestry extension become urgently needed by agroforestry farmers. As agroforestry is a new branch of study if compared to agriculture, most of the current agroforestry extension methods are modified from agricultural extension. In agricultural extension, methods were mainly developed to enhance production of staple food crops or short term plants. Meanwhile, the presence of perennial crops in agroforestry system require longer time to facilitate the process of technology dissemination, and to evaluate the effectiveness of the extension services. Also, agricultural systems tend to be monoculture, while in agroforestry there are high variation of plant combinations in the systems. Thus, if compared to agricultural extension, in agroforestry extension the focus will be more to equip farmers with knowledge that can enhance their analytical skills in managing their agroforestry garden.

Farmer Field School is an effective extension method that facilitate a two-way communication between farmers and extension agents through participatory process that can enhance farmer's analytical skills in managing their agroforestry farms. Farmer field school is a group learning process where farmers enhance their knowledge and analytical skills through observation and experimental learning conducted over the full cycle of crop production. The concept was originally developed and tested by the FAO in Indonesia in 1989 for controlling the use of pesticides in annual crops, particularly, rice (FAO, 2015). Thus, developing agroforestry farmer field school is expected to assist the improvement of agroforestry farm productivity in a sustainable landscape. This study evaluate the implementation of AFFS, one year after the AFFS is implemented.

Agroforestry Farmer Field School

Agroforestry Farmer Field School (AFFS) is extension approach that modified from the farmer field school developed by FAO (2015). AFFS is focusing on agroforestry farm management for enhancing farm productivity in sustainable manner. The objectives of the AFFS are to: 1) to enhance farmers' analytical skills in managing agroforestry that support the sustainable landscape management; 2) provide innovative extension approach that enhance farmers' analytical skills and information networking; 3) utilize farmer demonstration trial as a place to test and learn new agroforestry knowledge and technology; and 4) prepare expert farmers who will play a role as agroforestry extension agents.

Before AFFS is implemented, farmers will be asked to identify 5-7 priority species that want to be learned and integrated in their agroforestry systems. Farmers will also be asked to identify topics they want to learn in AFFS ranging from germplasm improvement to garden management. A 3-months session of AFFS focusing on 2 prioritized species is conducted with the first one month is focusing on exchange information and knowledge between researchers with farmers and extension agents on management and cultivation of prioritized species in an agroforestry system. The second month is to have a field visit to successful farmers that managed that prioritized species under agroforestry system. The third month is evaluation on the next steps for testing technologies that want to be applied in farmer demonstration trials. After at least 12 months of AFFS implementation, farmer demonstration trials will be monitored and evaluated per 3 months for the next 1.5 year. Thus in total at least 2.5 years is needed for implementing AFFS, with the first year for improving analytical skills and the next 1.5 years for facilitating the adoption process of the introduced technologies.

Due to the characteristics of the perennial crop in agroforestry system that have slower growth if compared to agricultural commodities, in AFFS meeting with farmers is less intensive if compared to FFS for agricultural crops. In FFS, a weekly meeting is commenced, in AFFS a biweekly or monthly meeting is conducted. Voluntary participation is become the basic principle in AFFS, thus there is no pocket money for participants in attending AFFS. Involvement of expert farmers become key in AFFS as technologies and information disseminators and advisor for building knowledge, skills, relationships and self-confidence of other farmers in the area.

Methods

Agroforestry Farmer Field School (AFFS) that focusing on agroforestry farm management was implemented in South and Southeast Sulawesi, Indonesia (Martini et al. 2016). In the study area, a project implemented by ICRAF, called AgFor (Agroforestry and Forestry), was running with the objective to enhance rural livelihood through improved agroforestry and forestry management. There were 5 sessions of AFFS involving 7 different commodities (cacao, coffee, clove, pepper, durian, nutmeg, citrus) prioritized by farmers. Combinations of different extension methods were used in the AFFS, ranging from scientist-to-farmer, farmer-to-farmer, field-site visit and development of demonstration trials. In the scientist-to-farmer, collaborations were made with four Indonesian national research agencies specializing on commodities that were prioritized by farmer partners. This collaboration facilitated the sharing of knowledge between researchers with farmers and extension agents regarding innovative technologies that can be applied by smallholder farmers in their agroforestry systems.

In total, 1733 participants (472 female, 27% of the total) attended the AFFS from April 2013 to February 2014. Evaluation on the implementation of the AFFS was made based on interview with 263 respondents (12% of total AFFS participants) from April to July 2014.

Results

The implementation of AFFS have contributed to the development of sustainable landscapes in Sulawesi where agroforestry is the main source of livelihood in rural areas. Based on the evaluation conducted one year after AFFS was implemented, new and reliable knowledge or information was perceived as the most important aspect motivating farmers to attend AFFS. From total of 263 respondents, 86% attended AFFS for obtaining new knowledge, 12% because they were invited by the organizer, and 2% invited by a friend and wanted to expand their networks by learning from successful friends who attended the AFFS. The evaluation showed that AFFS has enhanced knowledge of 97% of the respondents and has generated cash benefits of 14% of the respondents. The amount of money generated depended on the type of knowledge tested. Fertilizing and pruning were important techniques that yielded cash benefits for farmers in the short term.

From AFFS implementation in Sulawesi, outputs were produced:

- a) Farmer Demonstration Trials (FDTs) were established for testing the new knowledge on agroforestry management under farmers' conditions as well as to promote innovation by farmers. Some of FDTs were established in existing garden and some on fallowed land. From 109 FDTs that were established since October 2013 in South and Southeast Sulawesi only 73 that existed up to end of 2016.
- b) Expert farmers' capacities were enhanced to become farmer extensionist that play role as extension agents that disseminate agroforestry technologies and information. From AFFS implementation in Sulawesi, 35 expert farmers (20% female) capacities in agroforestry management and agroforestry extension were enhanced.

- c) Technical booklets produced on the management of priority commodities and topics. The booklets were distributed to farmers in the study sites and also can be accessed by farmers in other locations and can be downloaded from internet.

From budget perspectives, in total, costs of AFFS implementation per province that cover 10 villages was USD 5927 for 3 sessions of AFFS in one year. Implementation of each session to learned about 2 priority species costed USD1975, with most expensive activity is the field visit that costed 48% of total costs per session, while scientist-to farmer costed 38% and farmer-to-farmer costed 15%. Thus, if the available budget is limited applying farmer-to-farmer can be one of the option in implementing AFFS. Role of expert farmers in agroforestry will be key in the farmer-to-farmer approach.

Conclusions

Agroforestry Farmer Field School has contributed in providing skills and knowledge for farmers in managing their agroforestry in Sulawesi. In its implementation, AFFS is flexible to be modified based on the needs and available resources. In areas where agroforestry become source of local livelihood, integrating the AFFS approach with the government extension program is necessary for enhancing farmers' livelihood while also maintaining the environmental services quality in the area.

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