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Study on the Empowerment Effort of Conservation Farming on Kaligarang Sub Upstream Watershed

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Conservation farming be an option in utilizing dryland of upstream watershed, but in its application not only the technical aspects but also the socio-economic aspects should be considered. Research was aimed to obtain empowerment of conservation farming of social economic aspects. It was conducted by employing survey method approach to conservation farming in the village of Lerep, West Ungaran Sub-district, Semarang District, Central Java Province. Two farmer groups, namely "Ngudi Makmur" and "Sumber Hasil" were chosen as a partner throughout the experiment. Data used was a qualitative primary data collected through Focus Group Discussion (FGD). The results showed that the empowerment of conservation farming is needed to increase the productivity of small scaled-land by integrating mixed garden with livestock, depress dairy cattle production input from outside through feed formulation based on local resources and to determine the empowerment model of farmers of conservation farming sustainability while increasing farmers' income.

Keywords: Conservation Farming, Empowerment, Mixed Cropping, Small Farmer Scale, Watershed, Ungaran.

1. INTRODUCTION

Watershed region is a rain water catchment and drainage of water towards the sea, in need of development and empowerment of specific community. Watershed area is divided into two areas, namely the watershed areas upstream and downstream. The level of infiltration and run-off affected by physical condition of the land such as is soil type, slope and rainfall intensity.¹ Interests regulate land use in the watershed areas is to protect upstream watershed areas through land cover with vegetation. If the ideal conditions are fulfilled, then the fluctuations of the river flow will be more stable throughout the year, no flood in the downstream region in the rainy season and drought in the upstream region during the dry season.²

In this region, conservation farming is the most appropriate method that may be applied in the land use for agriculture. Through conservation farming, soil conservation technologies must be implemented when a steep slope land were kept for agriculture including arable crops. This may protect the land from erosion/landslides, degrade and eventually not become critical lands.³ These soils are generally acid soils with low organic matter content.⁴

Previous studies,⁵ show that the function of the upstream watershed of Kaligarang in sub-district of West Ungaran,

Semarang district is a function of protected areas and buffer zones. Land with an indication of low C-organic content (<2%), dominant gradient of 8–15% with the use of land as a mixed farming. Implementation of conservation farming has been done through the utilization of community forests and mixed garden that shows the erosion rate lower than fields and albizia gardens. The result showed that for conservation farming is the transformation of terraced-rainfed land that was dried become mixed gardens with cattle. The cropping pattern that has been implemented is mixed garden of cloves, coffee, grass and *Calliandra*. Implementation of farming may strengthen the conservation techniques on lands with crops terrace and use of manure. This is indicated that conservation has been implemented properly by farmers, although the implementation of the integration of crops and livestock on conservation activities just was carried out by 40% of the farmers.⁶

Land productivity of rice, corn, cloves, coffee, grass and *calliandra* was low, use of production facilities through the use of seed, fertilizer, pesticides and organic fertilizers was still limited.⁵ Based on the results of further research, the factors to increase the empowerment of farmers to access the excesses of the business, market, technology and negotiation in order to increase the income level was also still low.⁷ From the aspect of utilization of dairy cattle, increasing the carrying capacity of feed resources was essential to increase the milk production.⁸

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Likewise improve zoo-technical behavior will improve milk production and quality. Livestock farmers in the village of Keji, Lerep dan Sumerejo who has a carrying capacity of feed resources and good level of zoo-technical behavior may become a model of empowerment conservation farming with livestock. The purpose of this study was to assess the empowerment required by the perpetrators of conservation farming.

2. EXPERIMENTAL DETAILS

This study was conducted to assess empowerment of necessary conservation farming in Sub watershed area upstream of Kaligarang. The study was conducted in the sub-district of West Ungaran, Semarang District, from July to September 2015. The study was conducted with survey method approach on the conservation farming in Lerep village, sub-districts of West Ungaran, Semarang district.

The population of respondents of the research is the farmers group members in the sub-district of West Ungaran, Semarang district. In this area, groups of farmer have been formed scattered

in sub-districts and villages. The average farmer groups have 20 to 40 members. The sampling technique was conducted by withdrawal of two samples of farmer groups, with members between 20–40 farmers who implement conservation farming. Determination of the number of groups was purposive where all members of farmer groups with consideration of farmers who have farms land and raise livestock.

Based on these considerations two farmer groups, namely

- (1) farmer group of Ngudi Makmur and
- (2) farmer group of Sumber Hasil were elected.

Data used in this study was a qualitative primary data through Focus Group Discussion (FGD). It was collected using questionnaires method. The structure of the questionnaire for FGD consisted of an assessment on the empowerment of conservation farming and empowerment efforts.

3. RESULTS AND DISCUSSION

The result of the study as an effort to empower sub watershed conservation farming in the upstream of Kaligarang through FGD

Table I. Empowerment of conservation farming.

No.	Subject matter	Findings at Ngudi Makmur farmer group	Findings at Sumber Hasil farmer group
1	On the continuance of protected forests in the watershed upstream of Kaligarang.	It was still good. There is a local wisdom by maintaining source water with the expectation that it will not be interfered.	There were extension workers of the villages. Supervision of protected areas, and the seeds. Local knowledge is composed of the first cut and the third planting.
2	The decline in land cover in protected forest areas due to illegal logging and agricultural conversion.	Illegal logging was not there. No timber extraction. Indication of the forest and the cultivation was 75% and 25%, respectively.	There was no illegal logging. Rice field was converted into a perennial plant such as durian, mangosteen, cloves, and jackfruit). Difficulties in obtaining water for rice planting in the dry season, the water just enough to meet the needs of neighborhood.
3	Conservation farming by terracing techniques, plants strengthening for terrace and use of manure.	Terrace legacy, without knowing its function. The terrace was reinforced with trees, grass, <i>Calliandra</i> , <i>Leucaena leucephala</i> . Palm was planted at the bottom of the slope. Utilization of manure consisted of 3 biogas digesters but only one function and two did not work. This is due to the fact that the difficulty of maintaining.	There is a terrace. There is a strengthening plants such as mahogany, coconut, with grass planted between plants.
4	The trend productivity of conservation farming decreased and the selection of agriculture cropping pattern preferred either dryland farming or rice paddy.	Productivity of clove was not decreased but the selling price declined. The cropping pattern preferably mixed garden, trees, non staple food and elephant grass. The land area of paddy has been reduced 16 ha, which at this time paddy land area remains 1 ha. Conversion to mixed garden, red <i>calliandra</i> used as a stock of feed in the dry season.	Crop yield increases with the diversity of crops. Trees have started to harvest, because trees were planted about 10–15 years ago. Rice field were converted into a mixed garden, thus improving results. Composition of 30% agricultural crops +70% protection crop. Rice was cultivated traditionally with deep planting and tillers less. Plantation of crop is still depending on chemical fertilizers.
5	The trend of run off more quickly in the rainy season, erosion and degradation of water infiltration. Reduced water in the dry season.	The water in the dry season decreased, because the population is growing. Water flows down faster, and bring erosion.	January–February there has been no water. Source of water stops. In march to april, water is begin to flows.
6	Proposed empowerment of conservation farming in the watershed upstream of Kaligarang, both of soil and water conservation, as well as increased income.	Production was still good, but low prices. Good harvest of cloves, prices were low. Last year, the price was IDR 160,000 and now IDR 86,000/kg. Market of milk was rely on the middlemen with the price was IDR 4,000/liter (reasonable price was IDR 7,000). The results of the processing of coffee, sugar, ginger, has made by women farmers, but the sustainability of production and marketing is not yet assured.	Land tenure size was about 2500 m ² , it was dominated by cloves. Other crops such as durian, mangosteen, coffee were cropped. Results were not premium because pest problems and post-harvest processing. Livestock feed was need to be drilled. Capital catfish farming and dairy cattle and marketing of yoghurt were need to be coached. The permission of milk soap is hardly obtained from the Food and Drug Administration. Marketing of milk candy and ginger can only be done on the basis of the ordering.

was presented at Table I. The FGDs were conducted at farmer group of “Ngudi Makmur and Sumber Hasil” in Lerep village, West Ungaran sub-district, Semarang district.

Based on the point of view of conservation farming empowerment, farmers still did not make the effort on the productivity of crop yield and livestock. Although it is known that the level of productivity is significantly different with its potential productivity. The level of production and productivity is a matter of marketing and market absorption and price at the farm level.

As a reference to the production of cloves, the selling price was decreasing from year to year. Last year farmers received a price of IDR 160,000/kg, but this year it was only IDR 85,000/kg. Agro-processing of coffee, ginger, sugar has been conducted by women farmers, but continuity was not guaranteed, because marketing was also not guaranteed. Processing of milk into yoghurt was already done but have not been successful. Marketing of milk candy were also not guaranteed. Milk soap was already packed well, but was hampered by the expansion of the market. All of these condition occurred as it has not been registered, and there were no recommendations of the Food and Drug Administration.

Marketing is depending on the middlemen than cooperative. Dairy farmers are already comfortable with the price of IDR 4000/liter which pegged by the middlemen. Farmers can actually receive a better price, because of the ease of marketing taken personally by middlemen, than should be delivered by themselves to cooperatives with highly strict quality required. Dairy farmers are also aware that the achievement of production is only 5–10 liters/cow, thus high quality and cheap feed formulation needed. Actually these problems have been recognized by the farmers, but to solve it training on completed feed is needed.

4. CONCLUSIONS

The results showed that the empowerment of conservation farming is to increase productivity of small scale land with integration of mixed garden with cattle, input pressing of dairy cattle production from the outside through feed formulations based on local resources and the processing and marketing of dairy farming. The results of further research would be useful to determine the model of empowerment for farmer of sustainable farming conservation while increasing farmers' income.

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