MANAGEMENT MODEL OF MICRO IRRIGATION NETWORK BASED ON FARMER BUSINESS GROUPS

Susi Hidayah[1] And Santi Lestari[2]

ABSTRACT

The success rate application of micro-irrigation technology in Indonesia cannot be seen widely. The current application of this irrigation method in Indonesia is still very limited because there are several obstacles. Micro-irrigation requires a large initial investment as compared to other irrigation systems. The implementation of micro irrigation requires the readiness of farmers from the start of technology acceptance, the selection of plant commodities, the implementation of irrigation operations and maintenance, until the marketing of crops. This study produced a model of the farmer group business based micro irrigation network management system. The study was carried out by observing the application of micro irrigation in the established farming groups. The research step was to compile instruments for evaluating various types of farming based on the parameter group (i) land resources, (ii) human resources, and (iii) technological resources. The assessment instrument contains the weighting of these parameters to the maximum function of production. An assessment was carried out in four locations that had applied micro-irrigation in West and Central Java. The adoption of micro-irrigation technology by four groups was dominated by the introduction of micro-irrigation technology by the Government. There are groups that have mature age, stable organizations, have other business fields, so they are able to implement and develop micro-irrigation. The model of the micro irrigation network management system based on the farmer group which is organized shows the type of farm management with maximum benefits, namely the family farming business group management model.

Keywords: Management model, Farmer business group, Micro-irrigation.

1. INTRODUCTION

Micro-irrigation is an irrigation technique that has high water use efficiency. This system can save up to 82% of irrigation water consumption (BalaiIrigasi, 2009). Even in some research results, the increase can reach more than 90%. In addition, it provides high efficiency and effectiveness in meeting water needs for plants. This will be more successful if the drip system is properly designed and operated regularly according to the amount of need and time of water supply (Saprianto and Nora, 1992). However, the initial investment needed is relatively expensive, and intensive operation and maintenance efforts are needed. Even if it is applied properly, the drip irrigation system is able to provide very decent revenue, and ultimately able to support the welfare of farmers.

The Indonesian government made assistance efforts and applied this drip irrigation technology to farmers. This effort is carried out through groups that accommodate farmers. The farmer group is a farmer institution that directly organizes farmers in developing their farming. Farmer groups are organizations that can be said to function and exist in a real way, besides functioning as a vehicle for counseling and activating the activities of its members. Some farmer groups also have other activities, such as

[1] Researcher, Exerimental Station for Irrigation, Research Center for Water Resources, Ministry of Public Works and Housing; E-mail:hidayahsusi@gmail.com

[2] Exerimental Station for Irrigation, Research Center for Water Resources, Ministry of Public Works and Housing; E-mail:hidayahsusi@gmail.com

mutual cooperation, savings and loan business and social gathering for farming activities (Hermanto, 2007 in Nuryanti, 2011). Network maintenance work is also still an obstacle to the sustainability of the built irrigation system, the use of this technology is stopped because maintenance is not carried out and blockages occur. Maintenance also requires financing, if it is not balanced with the income from the farming business, then this cannot be done. This study aims to obtain a form of drip irrigation management carried out by farmer groups through farming which has the most optimum profit margin and IRR. The results obtained are expected to be able to provide direction or reference in managing this drip irrigation in other groups.

2. METHODS

2.1 Case Study Location

Assessments have been carried out in four locations. The first location is the Dewa Family Farmer Group, Pasirlangu Village, Cisarua District, West Bandung Regency. The second one is the MitraSukamaju Cooperative (Pasirlangu Village, Cisarua District, West Bandung Regency). The third location is the MekarSetia Farmer Group, MargaMukti Village, in Pangalengan, Bandung), and the last in the Makmur Farmer Group in Blora, Central Java.

2.2 Suitability Analysis of Farming Model

Based on the data collected in the assessment instrument tabulation, the four groups explained the conditions for each measured parameter. The farming analysis was also calculated according to the relevant literature. The results of the analysis are the existing management model diagrams for each group. Based on the results of a combination of quantitative and qualitative analysis, it is expected that a comprehensive picture of the ideal micro-irrigation management model is obtained in accordance with the four case study locations.

2.3 Maximum R/C

Revenue/Cost Ratio is a comparison between total revenue with total costs(Soekartawi, 2006 in Safira, 2017).The total cost is calculated for fixed costs and variable costs.

2.4 Instruments for Assessing Land Resource Parameters, Human Resource, and Technology Resources

Identification of parameter group rankings in various types of general farming is grouped into three, namely (i) land resources, (ii) human resources, and (iii) technological resources. Estimated parameters of each group as in Table 1 below. The parameters of this group are then released into more specific questions to get the information needed.

3. RESULTS AND DISCUSSION

3.1 Form of Farming Management in Micro Irrigation Networks at Study Sites

Early identification of forms of farming management in micro-irrigation networks was carried through literature. Some forms of farming management in the four locations for applying micro-irrigation are as shown in Table 2.

Table 1. Parameter group in various types of general farming

No.	Groups	Parameter
1	Land resources	a. Land tenure b. Concession of abandoned land.
2	Human resources	a. Management of business b. Financing c. Origin of capital d. Marketing results e. Management costs, calculated investment costs, financially f. Voting rights
3	Technological resources	a. Preparation of inputs the Technology used (micro-irrigation) b. Supervision of technology applications c. Micro-irrigation governance d. Quality control of crop yields e. Mastery of crops

Table 2. Form of identification models for each farmer group

No.	Name of Farmer Group	Form of Management
1	Dewa Family	*Family Farming* to*Collective Farming,*management, and group members are dominated by family relationships, there is no land consolidation.
2	MitraSukamaju	*Cooperative Farming*, one business unit, a kind of production cooperative, in which all decisions and arrangements for production facilities and infrastructure, the technology used, until the marketing of products is managed and cultivated by farmer groups, there is no land consolidation.
3	TaniMekarSetia	*Collective Farming,* a number of collectively managed agricultural areas, both based on farmer groups, which are the result of combining the management of land owned by its members to achieve economies of scale in its management, there is no land consolidation.
4	TaniMakmur	*Collective Farming,* a number of collectively managed agricultural areas, both based on farmer groups, which are the result of combining the management of land owned by its members to achieve economies of scale in its management, there is no land consolidation.

The MitraSukamaju Cooperative focuses on cultivating paprika. Members of the group numbered 90 people, including administrators. Drip irrigation technology was once applied in a greenhouse. However, due to the constraints of the initial investment and the cost of the OP drip irrigation equipment which is considered expensive, this irrigation technology is not being practiced anymore. Group members are more likely to use their capital to expand/add to the greenhouse.

The MekarSetia Farmers Group focuses on cultivating potatoes. The group members are 10 people. These members are divided into 2 groups, namely the cultivation group and the seed breeder group. Micro-sprinkler micro-irrigation technology has been applied in greenhouses for cultivation groups. This group is fostered by the Center for Development of the Pangalengan Potato Seed. For reasons of using a greenhouse for material warehouse purposes, the micro irrigation equipment when being reviewed is not being installed.

The TaniMakmur Farmers Group focuses on chili cultivation. The group members are 72 people. However, from a number of members, only 15 people were fostered by BPTP Central Java working on land owned privately by two members, using drip irrigation technology. The use of drip irrigation technology does not use greenhouses. Technology is applied to paddy fields. Source of water comes from shallow pump wells with a depth of approximately 6 meters.

Figure 1. Drip Irrigation Application in the TaniMakmur Farmers Group in Blora, Central Java Province

3.2 Maximum R/C

The four study locations that obtained complete data were in the Dewa Family Farmer Group and the R/C value for the cash cost was 9.0, and the R / C value for the total cost was 27.36. R / C ratio (Revenue Cost Ratio) is business efficiency, namely the size of the ratio between business income (Revenue = R) and Total Cost (Cost = TC). With an R/C value, it can be seen whether a business is profitable or not profitable. Effort efficiency (profitable) if the value of R/C more than one.

3.3 Recommendation on Micro Irrigation Management Business Model

Based on the results of the Sosekling (2013) study that so far the development of corporate farming models focused more on land consolidation, production management, and land management, even though the water manager was very crucial in the management of farming. Originally, as an integrative farming business model, irrigation must be integrated into the management flowchart or become an explicit part of the management model so that it can continue to be considered as an important component of the farming model considering that the water from irrigation determines the success of the production. For this reason, the emphasis is on aspects of tertiary irrigation management as a supporting component of corporate farming. Basically, the irrigation management system only covers two main activities, namely the operation and maintenance (O & M) of irrigation networks. Operation and maintenance are activities for regulating water and irrigation networks, which include the provision, distribution, use, and disposal, including efforts to maintain the condition of irrigation networks in order to function properly.

Given the productivity of agriculture will be largely determined by the optimal water from irrigation, in this case, is micro-irrigation, then mapping the conditions of irrigation network management, especially the role of community groups in their operations and maintenance is very important to study. The results of the Sosekling Research and Development Center revealed important matters to be elaborated including the capacity of the community in irrigation OPs, existing management models, the existence of management groups and their effectiveness, potential irrigation OPs that could be improved, advantages that could be optimized, solutions to solutions, and designing a tertiary irrigation management model that is better in supporting the optimal farming model that is applied.

For example on the mechanism of corporate farming by Nuryanti, irrigation positions have not been explicitly placed as a supporting production system. Whereas by placing it explicitly, this stage can be more controlled, even if it is possible to better

manage it according to the objective of farming this CF model as a whole. Group priorities, planting systems, etc. should be coordinated with seed producers and so on.

Some of the results of this study can provide input in determining the parameters of technological resources, especially micro-irrigation, in various forms of farming management that are able to provide the most optimum output. The formulation of the model as shown in Figures 2, 3, 4 and 5 below illustrates the results of the analysis for the micro-irrigation management model at the four study sites.

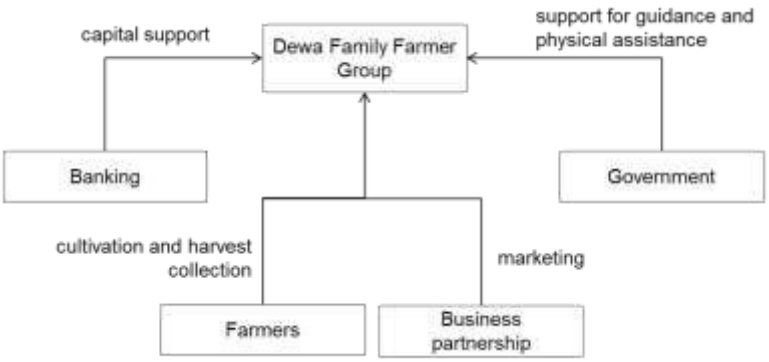

Figure 2. Management Model of the Dewa Family Farmers Group

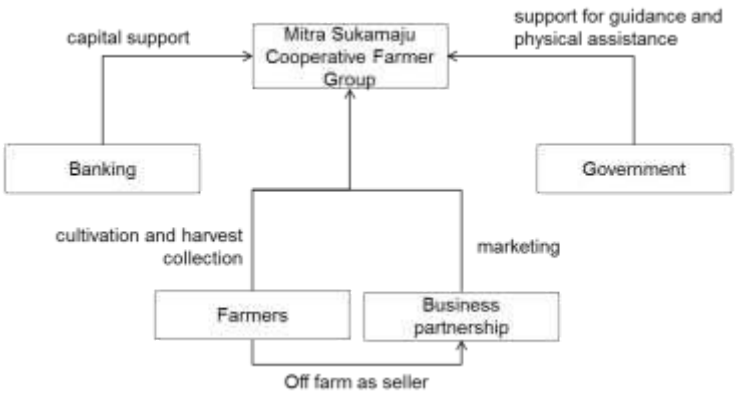

Figure 3. Management Model of the MitraSukamaju Farmers Group

Figure 4. Management Model of the MekarSetia Farmers Group

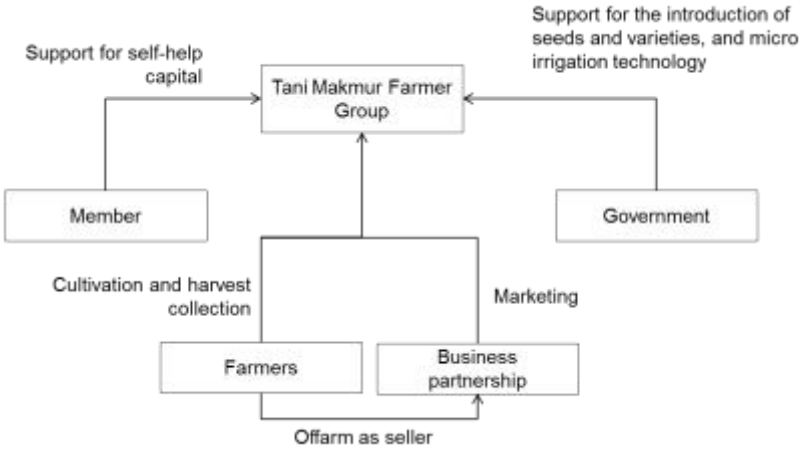

Figure 5. Management Model of the TaniMakmurFarmers Group

4. CONCLUSIONS

The farming system-based micro irrigation network management system model that shows the type of farming management in micro-irrigation with maximum profits obtained in the type of management that emphasizes the close relationship between group members, has strong capital and has a wide marketing network.

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