The 4th Asian Regional Conference & 10th International Seminar on Participatory Irrigation Management Tehran-Iran May 2-5, 2007



PARTICIPATING THE FARMERS ON OPERATION AND MAINTENANCE OF THE IRRIGATION NETWORKS SYSTEM IN CENTRAL JAVA AND WEST NUSA TENGGARA PROVINCES

Mohd. Ali Fulazzaky¹ and Slamet Imam Wahyudi²

ABSTRACT

According to the Law No. 7/2004 on water resources, the irrigation networks management in Indonesia consists: the feasibility, environmental impact and masterplan studies; construction step; operation and maintenance phase as well as the monitoring and evaluation. Implementing the irrigation management especially in the paddy field areas which needed a huge water consumption and request of involving the stakeholders for each step of the management processes. Therefore, the national policy also as mentioned in the Government Regulation No. 20/2006 declared that the central and local governments recognize the role of the water user associations (WUAs) to carry out the irrigation networks system management based on farmers' participation approach.

This paper elaborates several researches for analysis and evaluation of the farmers' participation on operation and maintenance of the irrigation networks system in two provinces in Indonesia: Central Java and West Nusa Tenggara. The methodology of researches is respectively following the several steps i.e examining the population survey of the defined sampling locations, distributing the questionnaires and collecting the feedback responses of the farmers, and collecting the other relevant data as well as analyzing the validated data and evaluating the farmers' participation levels. The research is also conducting the secondary data of the existing studies, including in the Yogyakarta special province region.

The appreciation of the farmers' participation assess through the role of WUAs at the planning, performing, and evaluating processes as the parts of operation and maintenance of the irrigation networks system management and representing the presence or absence as well as the aptitude of the farmers in the meetings and supporting the examination of the records related in the locations of study.

This research giving the general responses of the farmers' participation at the planning and performing processes respectively as indicating the scores of 2.77 and 2.80 and classifying the moderate categories as well as at the evaluating process as indicating the

¹⁻ Water and Wastewater Senior Expert: Indonesian Ministry of Public Works, Jakarta – Indonesia and Lecturer at the UTHM Johor – Malaysia, email: fulazzaky@yahoo.com

²⁻ Lecturer and Researcher et the Sultan Agung Islamic University, Semarang – Indonesia, email: siwahyudi@yahoo.com

score of 3.2 and classifying the high category. A general remark of the farmers' response on operation and maintenance of the irrigation networks system management in two provinces can be summarized as following: 42% of farmers is categorized as high participation, 16% as moderate participation, 32% as low participation and 10% as very low participation.

Key words: farmers' participation, irrigation network system, operation and maintenance

INTRODUCTION

The irrigation networks system management in Indonesia consists: the feasibility and environmental assessment impact studies; masterplan and detail plan preparations; construction step; and monitoring and evaluation phases as well as the operation and maintenance. Especially, the operation and maintenance phases have to be very close related to the irrigated agricultural field activities which needed a huge water consumption and involving the participation of the farmers as an important stakeholders. As highlighted in the government regulation and other national policies, one side, the farmer's participation on the irrigation management is being in order targeting the reduction of the annual government budget and, the other side, increasing the sense of belonging of the farmers and with care handling the maintenance of the irrigation network infrastructures.

One of the oldest farmers' participation through the WUA's organization in Indonesia is known as the "Subak" system in Bali island. The Subak is a traditional irrigation management institution of the irrigation networks system and founding as a socioreligious agricultural communities, it has been being more than one thousand year ago. The institution of the Subak system is a simple organization and corresponding the irrigated paddy field areas. In general, the system consists: Pekaseh (Chairman), Petajuh (Vice Chairman), Penyarikan (Secretary), Juru Raksa (Treasurer) and Juru Arah (Messenger). In general cases, the Subak communities meetings have to be assigned an agreement of irrigated water allocations and food productivity targets, especially for increasing the annual rice production (Sutawan, 1995).

According to the Law No. 7/2004 on water resources as highlighted in the Article 84, that the farmers have to be an equal opportunity taking part in the water resources management process i.e in the studies, planning, construction, operation and maintenance steps as well as in the monitoring and evaluation of the water resources management activities.

In the Government Regulation No. 20/2006 related to realization of the irrigation management in Indonesia, the government admits the farmer's participation through the role of the WUAs as the formal institutions to carry out the irrigation networks system management, i.e. planning, construction, rehabilitation, and operation and maintenance, as well as financing the irrigation networks system. It seems that the newly government policy has a good relevancy with the classic statement: "every body has a tendency to carry out all of the activities when he has to be participating in each step of management and decision making processes" (Davies, 1982).

According to the government regulation and policy also as mentioned in the Ministry of Home Affairs Decree No. 50/2001 and confirming the existing relevant studies such as

the study on water resources management program that has been executed under the Water Resources Sector Capacity Building Project, the WUA's participation on operation and maintenance of the irrigation network system representing by participating the farmers at the planning, performing and evaluating processes.

OBJECTIVES

This paper synthesizes several studies by exploiting the thesis of the students of civil engineering master of sciences program from both the Sultan Agung Islamic University and Gadjah Mada University and mainly based on the researches which have been carried out for analyzing the operation and maintenance performance of the irrigation networks system in Central Java and West Nusa Tenggara provinces, with the objectives of:

- understanding and describing the farmers' participation for operation and maintenance of the irrigation networks system management;
- defining the farmers' participation levels at the planning, performing and evaluating processes of operation and maintenance performance of the irrigation networks system; and
- assessing the farmers' participation impact on the planning, performing and evaluating processes of operation and maintenance of the irrigation networks system management.

The recommendations of each research have been contributed to the local governments as well as to the related WUAs as a supporting input for the decision making process at the policy and operational levels and improving the operation and maintenance performance of the irrigation networks system – especially in order to increase the participation of farmers located in two provinces: Central Java and West Nusa Tenggara, the points of view as operators and also in the same time as investors under the framework of the national food security program.

SCOPES AND LOCATIONS

The substances of this paper based on the researches in two provinces i.e Central Java and West Nusa Tenggara are only limited on the farmers' participation at the planning, performing and evaluating processes of the operation and maintenance phases of the irrigation networks system management and also supporting the existing other relevant researches.

The locations of study consist: the irrigation networks system management in Purworejo, Banyumas, Kendal and Kudus districts in Central Java province and irrigation networks system management in Sumbawa Besar and West Lombok districts in West Nusa Tenggara province, as showing in the map of the Figure 1. For completing the transcription being supported by the additional information coming from the researches of the farmers' participation on irrigation and sustainable infrastructures management located in Gunung Kidul and Sleman districts — Yogyakarta special province.

1198 International Seminar on PIM

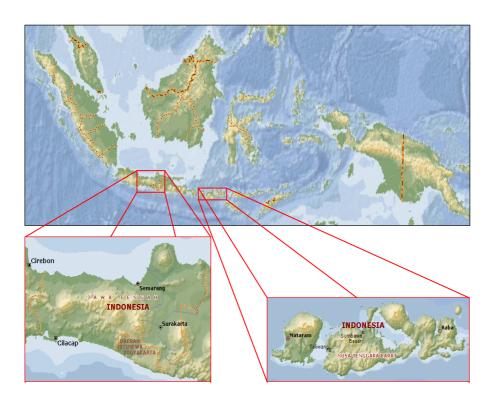


Figure 1. Central Java and West Nusa Tenggara provinces, the locations of study of the irrigation networks system management

METHODOLOGY

The procedure of the researches was systematically conducting the chronological experimentation stages i.e defining the locations, surveying the population and mapping, preparing the questionnaires, distributing the questionnaires and data collection as well as analyzing the data and evaluation.

Analyzing the farmers' participation levels at the planning, performing and evaluating processes of operation and maintenance of the irrigation networks system management, as following:

- Participating the farmers at the planning process indicated by monitoring the
 physical presence of the farmers in the meetings, contributing the ideas in the
 discussions, adopting the documents for the operation and maintenance plans,
 proposing the water allocation for irrigation purposes, proposing the plantation
 pattern proposal, and controlling the irrigation scheme which required for
 maintenance;
- Participating the farmers at the performing process indicated by cooperating between the farmers and the construction service providers, involving the farmers for the maintenance works, involving the farmer in the projects hand-over process, implementing the water user payment policy for the farmers, and supporting the operational of the water gates by the farmers; and
- Participating the farmers on the evaluating process indicated by reporting the illegal water uses by the farmers, reporting the destruction of irrigation

infrastructures by the farmers, reporting the conflicts of water uses and it solutions by the farmers, number of farmers as member of WUA and following the trainings, meetings and socialization programs that initiated both by the governments or NGOs.

The responses coming from the farmers were collected by the researchers based on distributed questionnaires for the random sampling areas and sampling clusters. Wherein, the sampling areas were selected a number locations of the irrigation networks system i.e four locations in Central Java and two locations in West Nusa Tenggara provinces and for the sampling clusters, the responses were collected from both the WUA's organizers and members.

The data analysis and evaluation resulting the farmers' participation levels have been carried out by applying the criteria consist of 5 participation levels as showed in Table I (Arikunto, 1992 and Sugiono, 2002). The responses of the farmers' participation were coming from 1,000 respondents and classified into five categories, as: very high; high; moderate, low; and very low.

Score range value based on standard Farmers' No Category deviation participation score 1 mean + 1,5 SD to mean + 2,5 SD>4 to 5 very high 2 mean + 0.5 SD to mean + 1.5 SD>3 to 4 high 3 mean - 0.5 SD to mean + 0.5 SD >2 to 3 moderate 4 mean - 1,5 SD to mean - 0,5 SD >1 to 2 low 5 mean - 2,5 SD to mean - 1,5 SD up to 1 very low

Table I. Criteria of the farmers' participation level

Note: mean is average score and SD is standard deviation

PARTICIPATING THE FARMERS AT THE PLANNING PROCESS

A number of researches with different variables and points of view concerning the correlation between farmers' participation and irrigation management performance has been studied in several region in Indonesia. The researches of the farmers' participation on irrigation and sustainable infrastructures management located in Gunung Kidul and Playen water district in Sleman – Yogyakarta Special Province have been reported that the leadership and communication factors as well as the ecological and social-economic factors affected the farmers' participation level and influencing the sustainability of the irrigation networks system management (Sudaryanto, 2006).

The researches giving the general response of the farmers' participation at the planning process as indicating the score of 2.77 and classifying the moderate category, with the detail responses of the farmers are: 43 % of high; 5 % of moderate; 38 % of low; and 14

% of very low categories, as showed in Figure 2. An enthusiasm of the farmers for participation at the planning process is important taking account to consider and sharing their aspiration for achieving the rightful and proportional water allocation entire the river basin catchment area.

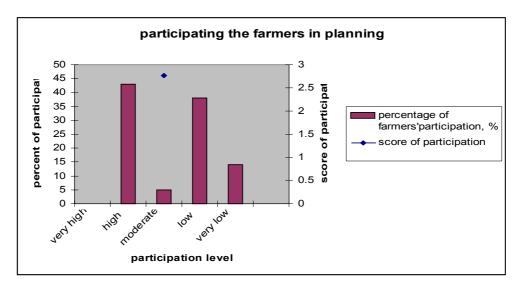


Figure 2. Profile of participating the farmers at the planning process

PARTICIPATING THE FARMERS AT THE PERFORMING PROCESS

Participating the farmers through the related WUAs for construction of the simple infrastructures giving a good participative model for maintaining after construction the public investments both constructed by the local and central governments, whereby the farmers' participation is kindly to carry out maintenance of the simple infrastructures. The important factors were hereby remarked under influence of the role of the technical assistants and the guidance from the government direction as well as the educational level of the farmers (Purwadi, 2003).

The general response of the farmers for participation studied at the performing process of operation and maintenance indicating the score of 2.80 and classifying the moderate category, with the detail responses of the farmers are: 35 % of high; 15 % of moderate; 45 % of low; and 5 % of very low categories, as showed in Figure 3. By analyzing the farmers' response of the studies which was carried out in the starting period of water resources reform, it could be optimistic predicted that will be increasing for the next years to come and, relevant with the law and government policies, participating the stakeholders will be making as an urgent request in the all of irrigation activities in Indonesia for the next time.

International Seminar on PIM

1201

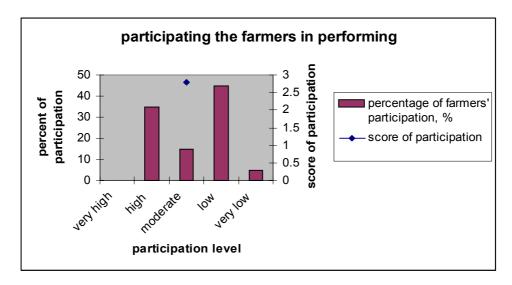


Figure 3. Profile of participating the farmers at the performing process

The participation of the WUAs for the routine and periodic maintenances as well as the operational activities and irrigation financing has been reported as a good image in Purworejo district – Central Java (Yuliani, 2003) and participating the farmers for implementation of the water rights, according the Law No. 7/2004, has been analyzed for the irrigation networks system management that was reported around 80 % of the farmers agreed with the water right principles and participating the farmers for water retribution fee was really remarked yield up to 45% (Istianah, 2005).

PARTICIPATING THE FARMERS AT THE EVALUATING PROCESS

The prospects of irrigation management hand-over confirming the national policy as highlighted in the Law No. 7/2004 and the Government Regulation No. 20/2006 to carry out taking over the responsibility of the irrigation management from the local government to the WUA's authority have been studied at the Mamak irrigation district in Sumbawa – West Nusa Tenggara. It was reported that the capability of the farmers for irrigation networks system management mainly depending the WUA's institution performance and then following the irrigation services management; agro-business climate condition; irrigation networks system condition; and conflicts resolution management (Wirawan, 2003).

The performance of operation and maintenance of the irrigation networks system has been analyzed in Kendal – Central Java. The technical factors i.e the accuracy of equipments for measuring the stream's flow; physical condition of the irrigation networks system; and illegal irrigation water losses as well as the non-technical factors i.e decentralization autonomous policy; unmatched plantation patterns; lack of the guidance from the local government; and low level of farmers' participation on operation and maintenance activities of the irrigation networks system clearly influenced to irrigated field management (Sunaryono, 2004).

The general response of the farmers for participation at the evaluating process as reported in these researches indicating the score 3.20 and classifying the high category, with the detail responses of the farmers are: 47 % of high; 29 % of moderate; 13 % of

low; and 11 % of very low categories, as showed in Figure 4. As showing by high appreciation of the farmers, it can be recommended that improving the participation of the farmers as principal stakeholders at the evaluating process for certain locations of low interest should be considered in the local government policy for the years to come.

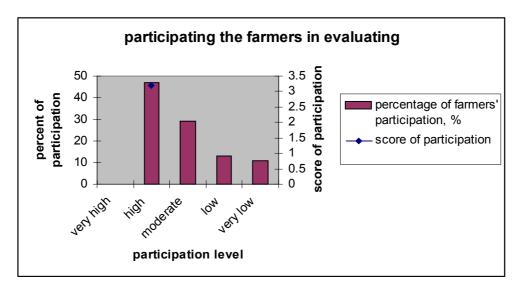


Figure 4. Profile of participating the farmers at the evaluating process

PARTICIPATING THE FARMERS ON OPERATION AND MAINTENANCE OF THE IRRIGATION NETWORKS SYSTEM

A research of the farmers' participation level at the upper Progo river basin in Central Java has been reported the different characteristics of each steps of operation and maintenance activities. Participating the farmers for the steps of the decision making and planning processes was monitored dominating the WUA's organizers, while the participation of the members of WUA was being passive. For performing step, it was observed a nice proportional correlation between the ownership of the land paddy areas and farmers' participation level. According to the existing research, the farmers who have more the land areas participate more active on all of operation and maintenance activities of the irrigation networks system (Mulyani, 1996).

According to this synthetic research, the total general response of the farmers for participation on the operation and maintenance activities of the irrigation networks system management can be optimistic classified by the moderate category, with the analyzed detail responses of the farmers' participation at the planning, performing and evaluating processes are: 41.7 % of high; 16.3 % of moderate; 32 % of low; and 10 % of very low categories, as showed in Figure 5. A good response of the farmers on operation and maintenance processes of the irrigation networks system management is important to consider the participation of them for other activities of water resources management due to a huge surface water consumption of the irrigated paddy field land, such as in the water resources conservation program, the river basin water resources planning, the water quality management and pollution control program, etc.

1203 International Seminar on PIM

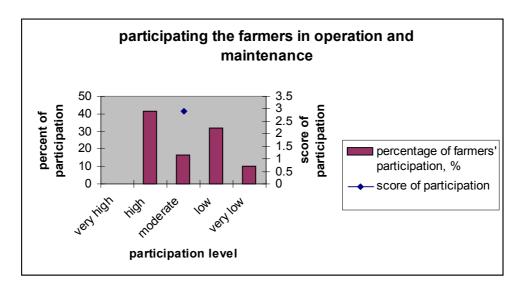


Figure 5. Profile of participating the farmers on operation and maintenance of the irrigation networks system

CORRELATION BETWEEN FARMERS' PARTICIPATION AND OPERATION AND MAINTENANCE PERFORMANCE OF THE IRRIGATION NETWORK SYSTEM MANAGEMENT

Carrying out the scoring the data of the farmers' participation at the planning, performing and evaluating processes. It is possible to be analyzed the performance of operation and maintenance of the irrigation networks system management both in Central Java and West Nusa Tenggara. And assessing the correlation between the farmers' participation and the operation and maintenance performance in this research, by following the F-test and supporting the SPSS-11's software. Analyzing the value of the F-test giving the $F_{calculate}$ is 51.56 and F_{theory} is 2.71, there for $F_{calculate} >> F_{theory}$. It can be concluded that the farmers' participation at the planning, performing and evaluating processes has a positive impact on the operation and maintenance performance. Regarding this reason, the participation of farmers really increases the performance of the agricultural management at the irrigated paddy field in Indonesia.

CONCLUDING REMARKS

For ensuring the national food security, the Government of the Republic of Indonesia desires for increasing the food production to achieve the national rice self-sufficiency and the efforts are relevant with several literatures as remarked by the popular slogan of: "more crops per drop" as an international statement for balancing between the food and the world population growth. Implementing the on going water resources reform policy remarked by issuing the Law No. 7/2004. Herein, the farmers' participation becomes the important issues for improving the performance of the irrigation management – especially on operation and maintenance of the irrigation networks system.

Several researches have been carried out for different locations in Indonesia for evaluation the farmers' participation on operation and maintenance of the irrigation networks system by different analysis methods and clearly concluding the positive impact. This synthetic research was carry out at six water districts in two provinces i.e Central Java and West Nusa tenggara, the results also showing that a good correlation between the farmers' participation and the performance of operation and maintenance of the irrigation networks system in Indonesia.

REFERENCES

- 1. Sutawan, N., 1995.; Water management in Bali island by Subak system, National Seminar on Water Resources Management, Udayana University, Denpasar Bali, Indonesia
- 2. Davies, A., 1998.; A model for planning and conducting activities, The training of adult and community educators, Australian Association of Adult Education, Canberra, Australia
- 3. Arikunto, S., 1992.; Prosedur penelitian Suatu pendekatan praktek, PT. Bina Aksara, Jakarta, Indonesia
- 4. Sugiono., 2002.; Statistik untuk penelitian, Affabeta, Bandung, Indonesia
- 5. Sudaryanto, E., 2006.; Effect of the farmer participatory on the operation and maintenance performances of the irrigation scheme management, Thesis, Civil Engineering Magister of Sciences Program, Sultan Agung Islamic University, Semarang, Indonesia
- 6. Purwadi., 2003.; Analysis of role of the construction supervisor and community officer on the participatory construction method implemented by the water users associations (WUAs), Thesis, Civil Engineering Master of Sciences Program, Sultan Agung Islamic University, Semarang, Indonesia
- 7. Yuliani, T., 2003.; Kajian parameter operasional dan pemeliharaan partisipatif untuk Perkumpulan Petani Pemakai Air (P3A) Studi kasus daerah irigasi Boro Kabupaten Purworejo, Thesis, Civil Engineering Master of Sciences Program, Sultan Agung Islamic University, Semarang, Indonesia
- 8. Istianah., 2005.; Kajian pelaksanaan Undang-Undang No 7 Tahun 2004 berkaitan dengan hak guna air di Kecamatan Undaan Kabupaten Kudus, Thesis, Civil Engineering Master of Sciences Program, Sultan Agung Islamic University, Semarang, Indonesia
- 9. Wirawan., 2003.; Kajian prospek pelaksanaan kebijakan penyerahan kewenangan pengelolaan irigasi kepada P3A Studi kasus daerah irigasi Mamak Kabupaten Sumbawa, Thesis, Post-graduate Program Gadjah Mada University Yogyakarta, Indonesia
- 10. Sunaryono, C., 2004.; Faktor-faktor yang berpengaruh terhadap kinerja jaringan irigasi Sojomerto Kabupaten Kendal, Thesis, Civil Engineering Magister of Sciences Program, Sultan Agung Islamic University, Semarang, Indonesia
- Mulyani, S., 1996, Faktor-faktor yang mempengaruhi derajat partisipasi P3A pada implementasi program penyerahan irigasi kecil (PIK) pada Cabang Dinas Progo Hulu Kabupaten Magelang, Thesis, Post-graduate Program Gadjah Mada University Yogyakarta, Indonesia