

JOURNAL OF RURAL INDONESIA

ISSN 2356-1890 | E-ISSN 2356-1882

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Jor. Rur. Indonesia	Vol. 2	No. 1	Pages: 1-140	Bogor June 2014	ISSN 2356-1890
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JOURNAL OF RURAL INDONESIA

Volume 2, Number 1, Year 2014, June 2014
ISSN: 2356-1890 | E-ISSN: 2356-1882

An International Journal. Available online at: <http://ruralindonesia.skpm.ipb.ac.id>

PUBLISHED BY:

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Email: ruralindonesia@ipb.ac.id;

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PRINTED BY:

Yayasan Pustaka Obor Indonesia

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AIMS AND SCOPE

Journal of Rural Indonesia (JoRI) devoted to cross-disciplinary and cross paradigm analysis of rural Indonesia and other developing countries. The journal publishes open peer-refereed research articles on the general field of rural and agricultural studies in Indonesia including its relationship with state, regional and global political economic forces and discourses as well as its ramification of environmental changing. The journal is open to new thinking, preliminary research findings, summaries of the literature in specific subfields, and review essays.

FARMER AND FISHER EMPOWERMENT MODEL BASED ON LOCAL INSTITUTIONS AND AGROECOSYSTEM TO INCREASE COMPETITIVENESS AND INCOME

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Received: 8th April 2014; Accepted: 27th May 2014

ABSTRACT

Small-scale farming and fisheries business are highly dependent on socio-agroecosystem condition, quality and performance of their products. This research aimed at formulating alternative empowerment model of farmer and fisher community. The research used research for development approach with multimethods, including rapid assessment, observation, interview, focused group discussion, action research, and multistakeholders dialogue. Farmer and fisher representatives of six villages from different types of agroecosystem and related informants were involved in the research. Action research was conducted in Muara and Benteng Villages. Research results showed that quality of the products positively correlated to income of farming business. Community awareness and motivation to improve their socio-economics and environment, technical skills and extension services are key factors of successful empowerment. © 2014 Journal of Rural Indonesia [JoRI] IPB. All rights reserved.

Keywords: community empowerment, small-scale farmers and fishers, agroecosystem, local institution, extension services, competitiveness

[**How to Cite:** Amanah, S., & Farmayanti, N. (2014). Farmer And Fisher Empowerment Model Based On Local Institutions And Agroecosystem To Increase Competitiveness And Income. *Journal Of Rural Indonesia*, 2(1), 91-104. Retrieved from <http://ejournal.skpm.ipb.ac.id/index.php/ruralindonesia/article/view/295>]

Introduction

In a broad sense, agriculture sector faces tough challenges due to changes in environment, social, economy, and culture. Farmers and small scale fishers as the main actors are always dealing with risks and uncertainty. UNEP (2006) stated that human life depends on the whole ecosystem on earth and available natural resources and environment services. Furthermore, the capacity of local institutions in managing the agroecosystem is still limited and unable to perform fully its role as medium for learning, cooperation, and personal development.

In dealing with declining ecosystem condition, the government seeks to involve the community in decision making and management (Shepherd and Terry, 2004). However, involving the community is insufficient; and according to Cullen *et al* (2007), it needs to be followed by empowerment and development of local knowledge on ecology.

Until this time, empowerment programs are still in forms of aid and project based. This causes farmers and fishers to depend more and more on external resources. As a result, when the programs are ceased, farmers and fishers return to their previous way of life.

According to Sajogyo (1982), community empowerment means placing the community as subject in the process of development. On the other hand, Mas'oeed (1990) said that empowerment is an effort to provide power or strengthening to the community. It is related with efforts to increase capacity of group that lacks power to make decisions (Friedmann, 1992). It is an implication of people centered development strategy.

The objectives of empowerment encompass improvement of farming techniques (better farming), improvement of farm business (better business), and improvement of the farmers' life and community life (better living). In order to achieve these objectives, other improvements are required: 1) Improvement of agricultural institutions to establish cooperation and partnership among stakeholders, 2) Improvement of community life, which is reflected in increase of income, security and political stability, and 3) Improvement in business and environment for the sustainability of farming (Deptan, 2002). Environment, in this case, includes aspect of agroecosystem and socio-economic environment. Hence, empowerment is a process of strengthening of self and the potentials of individuals, groups, organizations, or community to enable them to access resources, gain authority and right to make decisions concerning various available options.

In connection with the attainment of a more empowered condition, farmers' and fishers' main weaknesses in implementing their businesses are lack of thoroughness in handling products and not yet applying the 4 P principle (product, price, place, and promotion). This finding is consistent with research conducted by Fariyanti *et al.* (2007) and Irawan (2007) who stated that the problems encountered by farmers are production cost and fluctuation in price of commodities, lack of competitiveness, and inefficiency in marketing.

In the implementation of their business activities, farmers and fishers have unique conditions of socio-economics, culture, and environment. The linkage between

community of farmers-fishers and environment is apparent in the capability of farmers-fishers to manage natural resources and environment. Figure 1 shows the linkage between the subsystem of technology and human resources and the demand of consumers, which is fulfilled by the subsystem of post-production and will guarantee the income of farmer-fisher households. Results of research conducted by Amanah et al. (2009) show that strong farmer group institution can increase cooperation between farmers and external parties.

Farmers and fishers in several areas in Serang District, Tangerang, and Bogor have to deal with declining environment conditions. Their produce has not generated

sufficient income to meet their daily needs. This condition occurs among small scale fishers around Teluknaga Subdistrict, Tangerang District, and among small scale farmers in Serang District and Bogor. On that basis, the objectives of this research are to develop a model of empowerment that increases farmer and fisher competitiveness and income, and to explain the role of multistakeholders in managing a sustainable agroecosystem. The research proposition is “a model of empowerment through strengthening of local institutions and management of agroecosystem potentials, accompanied by assistance in increasing product competitiveness that will increase the income of farmers and fishers”.

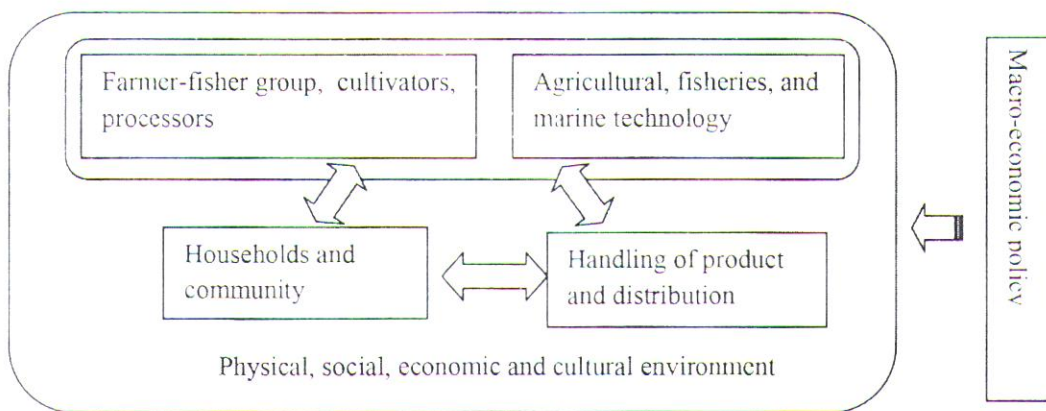


Figure 1. Linkage among Components of Management of Fisheries Activities (adapted from Charles, 2001; Amanah, 2008)

Research Method

The research applied multimethods, which consisted of rapid assessment of the condition of farmers-fishers, observation and interview, case study with action research, focus group discussion, multistakeholders dialogue, and triangulation. There were three stages in the research: exploration, case study, and follow-up dissemination.

Research Location and Time

Research location was purposively selected, which were areas with unique agroecosystem. The research began in 2010 with review of empowerment model, exploration through rapid assessment technique, focused group discussion, and observation in four agricultural and coastal villages. The villages were Tanjung Pasir Village, Muara Village, Pulo Kencana Village, and Ciruas Village (Table 1). The results of exploration were followed by selection of location for further in-depth research in 2011. In 2012, review and reflection of research results were conducted.

Table 1. Research Location in First Year

Agroecosystem	Location	Business Activities
Agriculture	Pulo Kencana and Ciruas Village, Pontang and Ciruas Subdistrict, Serang District, Banten Province	Agriculture (wetland/ rice field) and laying duck farm
Coastal	Tanjung Pasir and Muara Village, Teluk Naga Subdistrict, Tangerang District, Banten Province	Fishers, agriculture, and travel services

Action research in 2011 was conducted in Muara Village, Tangerang District, and in Benteng Village, Bogor District. Muara Village is vulnerable to natural disasters, particularly to storms and impact of sea level

rise. In this village, there are communities of farmers, fishers, milkfish farmers and those in processing. Benteng Village is characterized by rural-urban transition. In this village, there is women group who cultivates medicinal plants in the house gardens. Starting second year until third year, research results were disseminated in scientific forums, similar scientific group meetings, and among policy makers and practitioners.

Data

Data and information were obtained from primary and secondary sources. The collected data encompassed empowerment program in village under research, agroecosystem condition of village, and profile of farmers and fishers.

In the first year, primary data were obtained from 60 farmer and fisher respondents, administrators of farmer-fisher group, community figures, extension workers, and fisheries inspectors. Questionnaire and question guideline were used to obtain primary data. Group discussion was used to identify needs and confirm research results, whereas action research was conducted to explore institutional strengthening and cooperation network strengthening. Meanwhile, secondary data were obtained from *BPTP* Banten, *BAPPEDA* (Local Government Planning Agency) of Tangerang District, Food Security and Extension Agency of Tangerang, Office of Fisheries and Marine of Tangerang District, and (Agency for Extension of Agriculture, Fisheries, and Forestry of Bogor District.

Research Respondents

The respondents in this research were farmers and fishers selected purposively based on types of agriculture and fishery business conducted and willingness to be involved in the research. In first year, 30 farmer respondents were selected. These respondents came from agricultural agroecosystem condition: Pulo Kencana Village (15 persons), and Ciruas Village (15 persons). Another 30 respondents were from coastal agroecosystem: Tanjungpasir Village (15 persons) and Muara Village (15 persons). Interviews were conducted with Head of Fisheries and Marine Office of Tangerang, Office of Agriculture, Head of BPTP Banten, Head of BP4K of Bogor District, Coordinator of Program, Agriculture Extension Workers, and Fisheries Inspectors to obtain information on extension/empowerment program. In the second year, in-depth study through action research was conducted in Muara Village and Benteng Village, involving 10 participants from each village.

Data Analysis

Analysis of research data was focused on development of a model and strategy for empowerment of farmers-fishers in management of sustainable agroecosystem potentials for the development of product competitiveness, supported by the strengthened role of local institutions. Strategy for fisher empowerment was formulated through action research and confirmatory through multi-stakeholders dialogue.

Results and Discussions

a. Review of Several Programs of Farmer and fisher Empowerment and Role of Local Institutions

Of the four research villages in first year, FEATI Program has been conducted in Pulo Kencana Village and Ciruas Village since 2007. In Muara Village, Rural Agribusiness Program took place in 2009-2010; whereas in Tanjung Pasir Village, Economic Empowerment of Coastal Community took place in 2002-2006. Program *Rumah Pintar Rumah Produksi, Rumah Promosi dan Poskesdes* (Smart House, Production House, Promotion House and Village Health Post) has been conducted by *Solidaritas Istri Kabinet Indonesia Bersatu* (Solidarity of Wives of United Indonesia Cabinet) since 2010 in Tanjung Pasir Village, and Program Resilient Coastal Village in Tanjung Pasir Village and Muara Village started in 2012. Several social foundations and nongovernment organizations (NGO) provided assistance in research villages. Table 2 compares four empowerment programs that had begun in 2009-2011.

Farmers in Muara Village conduct their farming at estuary agroecosystem in Teluk Naga coast. The challenge faced by fishers in Teluk Naga Village was deteriorating coastal condition, such as abrasion, increasing waste garbage and increasing intensity of storms. Duck farmers and rice farmers in Pulo Kencana Village, Pontang Subdistrict, Serang District conducted duck farming with rice field agroecosystem, utilizing Cisaid irrigation canals to support their farming activities. Activities for development of farmer groups were conducted quite intensively through

program *Farmer Managed Extension Activities* (FMA) in Serang District, but development of fisher group in Teluknaga Subdistrict was still hindered by lack of fishery extension service.

Analysis of several farmer-fisher empowerment programs in research location showed that implemented programs tended to be project-based in form of transfer of knowledge, innovation. Community involvement was dominant

during implementation, but very limited during planning and evaluation of program. Development of farmer-fisher organization and development of local institutions have not become a priority.

Through focused group discussion, multi-stakeholders dialogue, and triangulation, understanding concerning development of community was attained during research. Community development should be founded on critical awareness

Table 2. Comparison of Four Empowerment Programs in Research Location

Description	Primatani	FEATI/FMA	PUAP	PEMP
Objective	Pilot Program and Acceleration of Socialization of Agricultural Technology Innovation (Prima Tani). The objective is to develop a pilot model of a system and activities of a progressive agribusiness that is innovative technology-based, which integrates innovation system and agribusiness system	Develop agricultural extension through innovation, with farmers as main actor and strong farmer institutions	Reduce poverty and unemployment through rural agribusiness activities 1) Improve capability of agribusiness actors, <i>Gapoktan</i> administrators, extension workers and supervisors of Mitra Tani 2) Empowerment of farmer and rural economic institutions 3) Increase function of farmer economic institutions in their access to capital (Darwis and Rusastra, 2011)	Increase quality of coastal community life through empowerment of productive economic activities
Institution involved	Ministry of Agriculture via BPTP	Ministry of Agriculture	Ministry of Agriculture, BPTP, and Office of Agriculture	Ministry of Fisheries and Marine
Output	Improvement of wetland rice farming, vegetable cultivation based on Standard Operational Procedure, and livestock farming using integration pattern.	Strengthened extension institutions at local level	Increased income, employment opportunities in rural areas	Available facilities and infrastructures for fishery business in coastal areas, from upstream to downstream Available supporting institutions for coastal community activities.

that the community should progress and a need to develop. Confidence in farmers' and fishers' potential is the main capital for success in empowerment. Competent extension workers or facilitators are necessary for farmers and fishers so they can strengthen their efforts to increase capability in business and conservation of ecosystem.

Strong social institutions are an important element in supporting the success of empowerment programs. Local institutions in research villages faced constraints in functioning as medium for learning and cooperation. This was caused by weak organization structure, failure of leadership to function as activator, and farmers and fishers who were still highly dependent on paternalistic pattern. In this connection, Suradisastra (2006) said that institutional strengthening can be implemented through internalizing values, norms, functions, and rules; agricultural development through transfer of information, knowledge, and technology; legitimacy of leadership and agreement made; and conducive management in attainment of social resilience.

Local institutions that developed in research villages were in form of agreement on management of irrigation water in wetland agroecosystem in Ciruas Village and Kencana Village, agreement between investors and duck farmers in Pulo Kencana Village, profit sharing among fishers and fish farmers in Tanjung Pasir Village and Muara Village, and regulations concerning debts in all research villages. Farmer and fisher groups were deficient in written statutes and bylaws. During FGD, several issues were discussed to be specified in statutes/bylaws: membership,

dues, rights and obligations of members, duty and authority of administrators, group activities, cooperation with external parties, and internal arrangement. Farmer and fisher groups in research villages were encouraged to prepare written document on statutes/bylaws, which should be acknowledged by Head of Village.

Uniqueness of Agroecosystem and Profile of Respondents

Wetland Agroecosystem: Ciruas Village and Pulo Kencana Village

Ciruas Village is a region of rice wetland agroecosystem with technical irrigation from Pamarayan Barat Dam. The area of this village is 153 hectares, with following land use: 120 hectares (78.4 percent) for wetland rice field and remaining 33 hectares for office use (13 percent), residential area (3.3 percent), road (2 percent), and upland (3.3 percent). The majority of the people in this village are farm labors, traders, and working in private sector.

Sector of agriculture absorbs around 56 percent, working as farmers and farm labors. The cultivated commodities are wetland rice, upland crops, such as groundnuts and tubers, and horticultural crops, such as long beans and cucumbers. Source of supplementary income is duck farming.

Pulo Kencana Village is 5 m above sea level. In general the soil is Grey Hydromorph, with sandy loam texture, high porosity, pH of more than 5 – 5.9, land gradient between 5 – 8.9, and low level of soil fertility, high saline level, and low capacity of exchange link due to lack of organic fertilizer use. Most of the people

in Pulo Kencana Village live from wetland agriculture. Farmers plant rice twice a year, intercropping with long bean.

These last several years Pulo Kencana Village has developed farm business, that is of laying duck and muscovy/wild duck farms. This activity is facilitated by FEATI Program. The drainage channel from Cisaed irrigation has made the ecosystem of the village highly supportive for duck farming, both of laying ducks and muscovy broilers. Duck and muscovy farms are located on the edge of Cisaed irrigation canal, about 100 meters along the riverbank owned by Ministry of Public Works. Consumption of duck and muscovy in Serang District was quite high during religious festivity and celebrations.

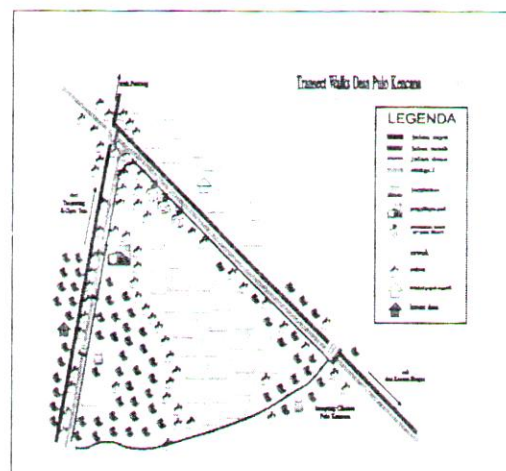
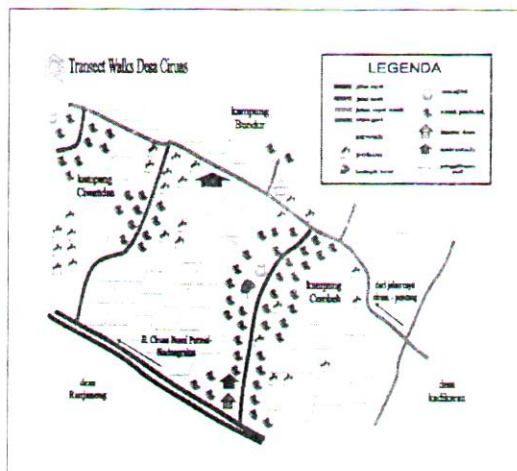
Since the New Order era, Ciruas Village of Ciruas Subdistrict and Pulo Kencana Village of Pontang Subdistrict have received various agricultural programs to increase rice production and thus, maintain food sufficiency. Rice farmers have long received guidance from various government

institutions. For example, an improvement of rice planting technique, called *legowo* technique, has been long introduced by the Office of Agriculture. According to farmers, the *legowo* technique has increased quite large amount of rice production. At present, this technique has spread in the rural areas of West Java.

Coastal Agroecosystem: Muara Village and Tanjung Pasir Village

Muara Village is an area in Tangerang District where the estuaries of Tahang River and Kramat Kebo are located. The altitude is around 0 - 1.5 m above sea level. The area consists of swamp and mangrove forest, especially in the northern part bordering the sea. Some parts of the village are ponds/embankments or land inundated by water. Clean water is difficult to find, and people have to buy fresh water.

Muara Village is 7 km from the capital of subdistrict and 40 km from the capital of district. From Jakarta it is 35 km and from Soekarno-Hatta airport only 10 km. There



Picture 1. Transect of Ciruas Village and Pulo Kencana Village

are no four-wheel-transportation that can connect the village to centers of economic activities.

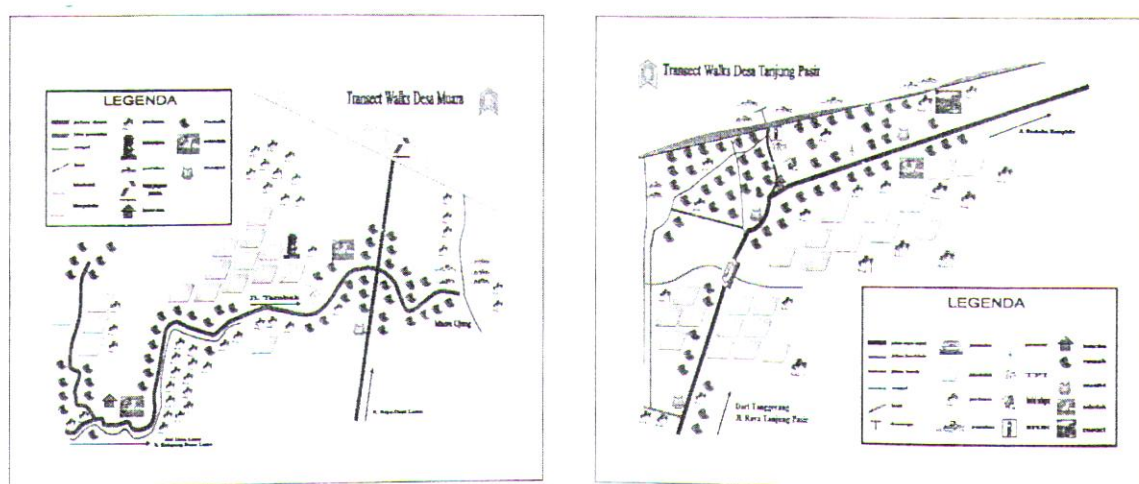
The livelihoods of most people in Muara Village were farm labors, fish farmers, and fishers. Their average income ranged from Rp 10.000,- to Rp 15.000,-/day/family of 4-9 persons. Hence, it can be said that more than 75% were families below standard of living. As for level of education, most of the people in this village only completed or did not complete elementary school, and there were 494 people who were illiterate. In this village, Ganeca and *Dompot Dhuafa* NGOs participated also in the empowerment program by providing capital loans. Institutions of saving and loan cooperatives were established, and duck and goat farming was developed, but activities of fishery produce processing have not been established in the empowerment program managed by these NGOs.

Tanjung Pasir Village is a representation of fisher village. The seaside is full with rows of boats. Fishers that actively go to sea

is the daily activity in this area. The place for Fish Auction is opened at 11 o'clock. The busy transactions at fish auction show the profile of fisher hamlet/kampung where coastal area and the sea become sources of livelihood.

These last few years Tanjung Pasir has become an alternative access to go to Kepulauan Seribu, DKI Jakarta Province. This has induced Tanjung Pasir into becoming a place for tourism, both as direct destiny for tourism and as connection and transit area to tourism area of Kepulauan Seribu. Every weekend the village was crowded with visitors. Fishers rented out their boats to tourists or took tourists to Kepulauan Seribu. This activity has increased household income.

Fishers in Tanjung Pasir Village used nets, mesh, and rods. The diversity of fishers was patterned by location. Net and rod fishers occupied the location along the coast of the village. Mesh fishers lived along the coast of Garapan Hamlet/Kampung. In addition to fishers, some of the women processed the



Picture 2. Transect of Muara Village and Tanjung Pasir Village

catch brought by their husbands, making shrimp/fish paste and salted fish.

Fishers in Muara Village were mesh fishers. To increase their income, the people in this village worked, processing small shrimp or became merchants, government employee, factory workers, construction workers, and other professions.

Profile of Respondents

Aside from having formal education, respondents in Ciruas Village and Pulo Kencana Village had nonformal education in forms of agricultural training (*legowo* system of rice planting, use of pesticides, PUAP, FEATI, and FMA) and agricultural extension. On average, the respondents, as

Table 3. Profile of Respondents in Four Research Villages through Rapid Assessment

No	Description	Ciruas Village	Pulo Kencana Village	Tanjung Pasir Village	Muara Village
1	Average age (years)	53	44	42	41
2	Sex:				
	- Male	14	12	12	13
	- Female	1	3	3	2
4	Level of education:				
	- No schooling	-	-	2	3
	- Not graduated from Elementary	4	4	3	1
	- Elementary	7	6	9	11
	- Junior High	3	2	-	-
	- Senior High	1	3	1	-
5	Non formal education:				
	- Agriculture training	5	8	-	-
	- Extension	1	2	-	-
6	Public Works:				
	- Farmers	13	13	-	-
	- Livestock farmers	2	2	-	-
	- Fishers	-	-	13	13
	- Fish Processing	-	-	2	1
	- Fish Merchants	-	-	-	1
7	Period of business (years)	33.2	22.8	29.1	25
8	Fishing Trip:				
	- One day fishing	-	-	11	13
	- One week fishing	-	-	2	-
9	Average area of land ownership (m ²):				
	- Owned land	4,358	7,500	-	-
	- Not owned	4,167	7,167	-	-
10	Average main income (Rp/year)	10,408,667	7,328,571	12,440,000	9,207,143

Source: Amanah and Farmayanti, 2011

shown in Table 3, were experienced in their respective field (more than 22 years). Ever since they were children, the respondents had worked, helping their parents as farmers and fishers. Hence, once they became adults, they were able to work independently.

The livelihood of most respondents (87%) of Ciruas Village and Pulo Kencana Village was rice farmer, and the common variety planted was Ciherang. In Ciruas Village, the average area of land ownership was 4,583 m² and non-owned land was 4,167 m². In Pulo Kencana Village, the land owned was 7,500 m² and non-owned was 7,167 m². Although average area of owned land in Pulo Kencana Village was larger than that in Ciruas Village, the average income of farmers in Ciruas Village was larger than that of farmers in Pulo Kencana. The efficient use of production inputs and higher productivity made Ciruas farmers more superior. Table 4 shows respondents' income in four research villages (through rapid assessment).

Table 4 Distribution of Respondents based on Business Income in Four Villages

Income (million Rp)	Ciruas (persons)	Pulo Kencana (persons)	Muara (persons)	Tanjung Pasir (persons)
< 1	5	5	14	15
1 - < 2	3	0	0	0
2 - < 3	3	4	0	0
3 - < 4	2	4	0	0
4 - < 5	1	3	0	0
> 5	2	0	0	0
Total	15	16	14	15

Note: Results of square khai test show significant association ($\alpha = 0.05$) between agroecosystem potential and farmer-fisher income

Action Research of Farmer-Fisher Empowerment

Study villages have uniqueness in agroecosystem and is related with agroclimatic condition. The agroecosystem of wetland lowland agriculture in several areas in Java (UNDP, 2007) could be planted with rice twice a year, but the second harvest was more vulnerable. In agroecosystem of dryland lowland, farmers planted drought-resistant rice. Farmers of dryland cultivated upland crops and raised sheep. Cultivation of non-rice commodity was farmers' attempt to be cautious in case of harvest failure and also as an alternative to increase income.

Agroecosystem in coastal area is unique and different from the condition in agricultural land. In both coastal villages, cultivation of milkfish, shrimps, groupers and crabs was conducted in ponds. Owners of fishponds were investors from outside the village.

Action research conducted in Muara Village and Benteng Village shows that individuals or group who desired empowerment should have the fundamentals: awareness and the will to act, and concrete action. Without awareness and will, it would be difficult to attain expected results of any forms of implemented programs.

The process in Muara Village was preceded by exploration to groups of community, farmers, fishery product processing women, and fishers. Positive responses that emerged after the process of dialogue succeeded in fostering the will and trust of the community to conduct changes. A number of activities were conducted to cultivate a sense of belonging.

Group activities required assistance to motivate the community.

Action research in Muara Village was conducted in connection with processing of fishery products (shrimp paste made of very small shrimp/*rebon*, snack made of fish products, and packages) and increasing awareness of environment conservation. The community of Muara Village has begun to realize that the present environment condition would have an impact on human life at present and in the future. Based on this awareness, the community was open for inputs concerning environment conservation. In forum of dialogues among multistakeholders, aspirations and phenomena in Muara Village were always conveyed to policy makers. The village condition that was far from public reach and susceptible to storm disaster has urged the government to select Muara Village for implementation of Resilient Coastal Village Program starting 2012. Planting of mangrove and improvement of environmental condition of estuary has been implemented.

The process in Benteng Village was faster. This was related with the intensity of activities of group of *Tumbuhan Obat Keluarga/TOGA* (Household Medicinal Plants) processing that has been active long enough with assistance from IPB. However, the women group of TOGA processing faced constraints in marketing and availability of supply of plants to meet buyers' needs. Administrators and members of TOGA group suggested to improve the capability to produce organic fertilizers. The purpose was to recycle organic waste around the residential of TOGA group members. By processing waste into fertilizers, the

processing group received double benefits: clean environment and flourishing growth of TOGA plants. High motivation level of TOGA group was a supporting factor for the success of TOGA business. Even though there was difficulty in having arable land for TOGA, the TOGA group continued to maintain productivity and quality.

Alternative Model of Farmer-Fisher Empowerment

The principle for alternatif model of farmer-fisher empowerment is that empowerment can attain expected objectives if the overall process is implemented by paying attention to needs of farmers-fishers, agroecosystem condition, and with awareness and will for self-improvement. Awareness for self-improvement can grow if there is concrete example for farmers-fishers and encouragement for empowerment towards transformation; and thus, increase the income and welfare of small scale farmers-fishers. Farmer-fisher empowerment can be supported by assisting bridging aspirations, experiences, and needs of farmers-fishers with various parties, especially decision makers. Assistance can be conducted through the roles of who are innovative, creative, and motivating extension workers or field staff or facilitators. The role of extension workers can be performed by staff, advanced farmers (government extension workers), and non-government extension workers. In the increasing vulnerable agroecosystem condition, farmers-fishers can develop appropriate technologies that are efficient and effective for increasing income.

Conservation of agroecosystem in agricultural and coastal areas requires

community participation from upstream to downstream, government supervision, and support from private sector. This can be achieved if community awareness is supported by sustainable concrete actions and business activities that apply the system of zero waste and safe environment.

Conclusion

Small scale farmers and fishers face a condition that is increasingly declining in terms of quality of physical environment and where local institutions that have not performed their role as medium for learning and cooperation and as medium for productive economic activities. Farmers' and fishers' needs are strengthening of institutions and organizations of farmers-fishers, development of productive economic activities to increase income, and cooperation in conservation of agricultural and coastal ecosystems. Empowerment model of each community group and community is specific and cannot be generalized. This is related with differences in values, culture, potential of natural and human resources, experiences, and needs.

There is a significant positive correlation between the agroecosystem condition and income of farmers-fishers. Farmers and fishers need strengthening of capacity in managing the potentials of agroecosystem through social and technology innovation that produce competitive production. Activities of forest plants nursery conducted by TOGA farmers and women farmers and salted fish and shrimp paste processing have prospect to develop through facilitation of local government in cooperation with private sector, and supported by sustainable education-extension program.

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