



## **The Prospect of Integrated Farming System of Crops-fish-husbandary as the Survival Strategy to Secure the Farmers' Economy: Case Study in Magelang - Indonesia**

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### **ABSTRACT**

Agriculture plays an important role in Indonesian economy with its share of 14.4% to the gross domestic product per 2013. In fact, number of farmers nowadays is declining in line with decreasing in land-use for agriculture. All of this could brought about the decrease in productivity, particularly in the existence of climate change phenomena. The heavy peasant life need an alternative survival strategy. One of the survival strategy practiced by farmers is through integrated farming system for crops-fish-husbandary. This study is aimed to formulate the survival strategy to secure the economy of household farmers through integrated farming system. Interviews with farmers, relevant parties/stakeholders or informants were carried out. The approach of integrated farming system was employed in the study. It is found that integrated farming system of fish-crops-husbandary is significant to secure a their household economy. Farmer produces differentiated products based on market demand to ensure their sufficient monthly income.

**Keywords:** Farming, Survival, Strategy

**JEL Classifications:** Q12, Q15, Q55

### **1. INTRODUCTION**

Recently there is a shift in people life style, particularly in urbanised area. Profession as a farmer become less favorite than the jobs of services and industry. In fact, a piece of land for agriculture activities, particularly for paddy field have been converting into estate, buildings and settlement. Available land for planting a crops are fragmented.

The interest of people engage their job in agriculture is declining and approximately farmer owned for <0.5 ha of land as claimed by about 54% of them (Pary, 2011). Consequently, the productivity and income generated by farmer's household tend to decline from time to time. The farmers' fate is getting gloomy, their life is getting poor. Various programs of agricultural extension are only limited to programs without any real implementation. A lot of farmers still live on an income of Rp. 300,000.00 - per month (Aushuria, 2013).

Farmers's activities in rice production start from preparing the field by plowing, sowing rice seedlings, seed planting, re-planting then grassing, eradicating from pest, herbice, etc., and till harvesting. Pest and hebiciding is considered as the tiring task in order to secure the crop's yield (Prajanti, 2014). Farmers must ensure that the grain has been threshed to be dry thoroughly to make it sold and given price by the middlemen. In the final stage, the farmers have to face the bitterness of low grain prices that cannot cover the production costs.

Nowadays, farmers need to carry out their business and should putting an efforts for alternative income generation for household's cash inflow. One of the prospective alternative activity is rearing freshwater fish as done by about 41% of farmer in Magelang regency (Pratiwi, 2012). The fish stocking rate in the study area are composed by fingerlings of tilapia-carp-pomfret. The fish fry is produced from conventional farmer's hatchery. Multi-tasking activities combination between fish-and-paddy-

farming is called as “Mina-Paddy.” The size of the pond-paddy field with ranges of 40-60 cm and with a depth of 40 cm. The best species of fish reared in the study area is carps. This fish species grow well in shallow water and resist from a heat. The fish seed is spreading out after the rice has been planted for 5-7 days. Then the expected harvest time is after one to 1½ months. For 1 ha usually farmer plant with stocking rate of 45,000 fishfry. The price of fingerlings per one cup (contains 1500-2000 fish fry is for about Rp. 10,000). Then, its survival rate to harvest is about 3-10 kg of fish. This business is soundly good to provide favourable profit for farmers.

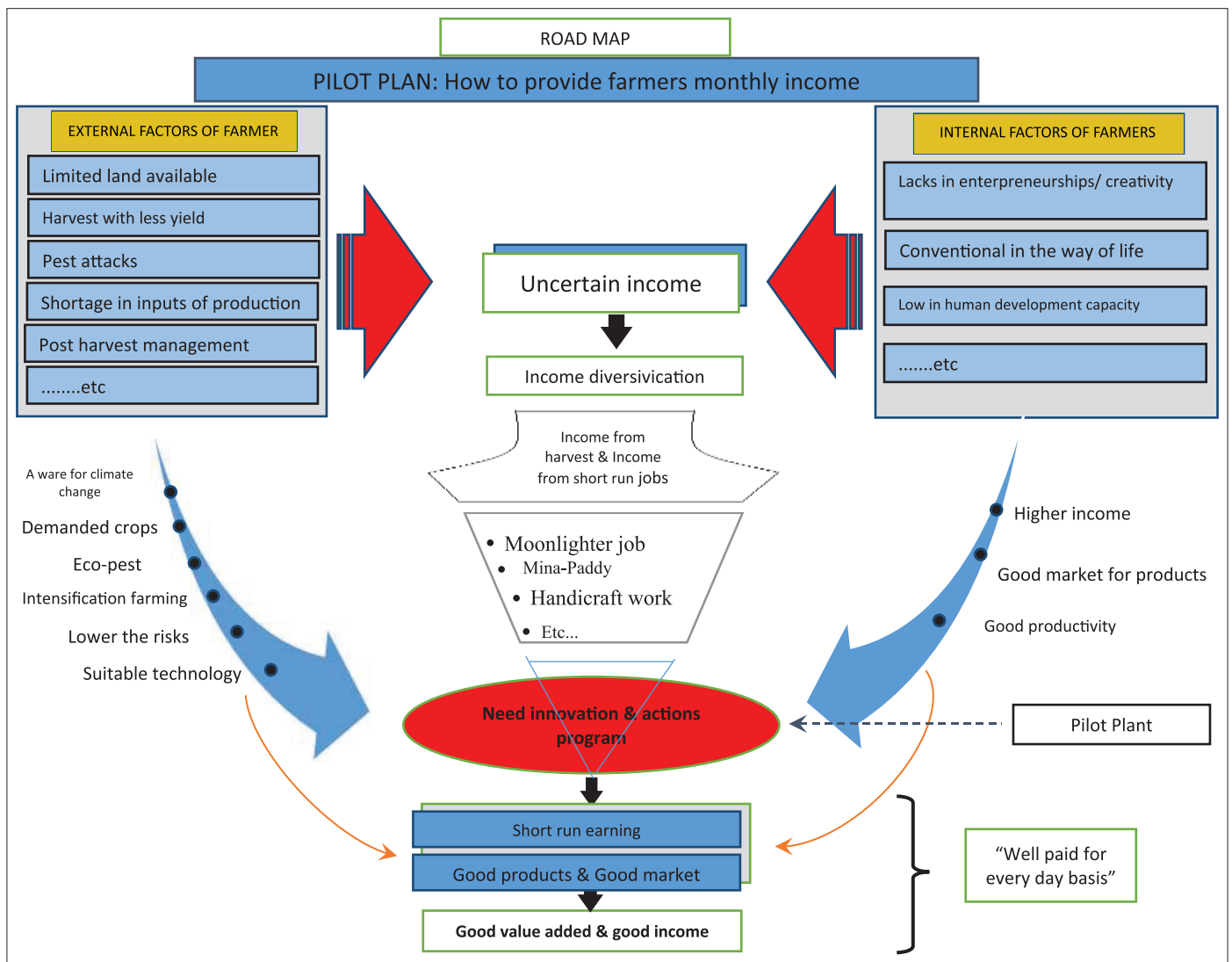
## 2. MATERIALS AND METHODS

This study is employed the theoretical framework of empowerment (Susilowati et al., 2008). The community empowerment is one of means to facilitate the growing development. This requires community’s initiative and spirit of to boost the social activities improvement (Christenson et al., 1989). In this context, empowerment could grow from the awareness of people. Carver and Clatter Back (in Riza and Roesmadi, 2006)

defines empowerment as an attempt to encourage people to take individual responsibility to improve and to contribute to the goals of the organization or their entity. The indicators of empowerment from economic is attributed by possible access to market, technology, and networking. While the non-economic aspects are from capability in lobbying, self-actualisation toward the society and role of the takeholders (Susilowati and Kirana, 2004).

The location of this study is in Bojong village, Mungkid sub-district, Magelang Regency. The study employed primary data and secondary data. The survey was conducted to interview farmers as the respondents. The empowerment strategy is prioritized to some extent of 60 farmers who practiced for “Mina-paddy” (combining activities in rearing fishfry with paddy in one farming system). These selected strategies are determined by the Focus Group Discussion (FGD) and in-depth interviews with respondents and also the key-persons. The competent key-persons were selected for FGD to outline the strategy of empowerment for the stakeholders were composed by academician (A), business (B), government (G), and community (C) (Figure 1).

Figure 1: Pilot plan: How to provide farmers monthly income



### 3. RESULTS AND DISCUSSION

Farmers prepare the land by plowing the paddy, seedlings, planting and harvesting. Farmers have to do grassing, fertilising with expensive price of fertiliser and eradicating from pest and herbicide. It is often happen that farmers encountered problem in water and irrigation due to an extreme dry season, lacks for the infrastructures and also high competition for shortage of water for agriculture versus industry and also for human use. At harvest time, the threshed grain must be dry to make it given price by the middlemen. At this moment, the yields of paddy harvested by farmer has low grain price. Perhaps this might caused by the lacks of postharvest handling. At the sametimes, the buffer stock management in which should be governed by the logistic board in the respective regional level may not effectively managed. Therefore the function of floor price-and-ceiling price is far from complete.

Land ownership of the most farmers in the research area and also in Indonesia is relatively small (<0.5 ha). The farmers may only able to cover their household's expenditure are about only 54% from their farming income (www.gerbangpertanian.com). Most of the cultivated land in Java is the inheritance land owned by farmer. Javanese people has unfavourable believed such as "*mangan ra mangan waton kumpul, alon alon waton kelakon, banyak anak banyak rezeki*" (eating or not, family should be together; slowly but sure, many children many fortune). This believed should be got rid off when we encourage for higher productivity. In fact, many of farmers still powered less in production, postharvesting, and marketing their crops products. Therefore it is indeed need empowerment both economic and non-economic (Susilowati et al., 2004).

Figure 2 shows that farmers in the study area (73%) have no accessed to the financial institution or borrowed business capital for agriculture because the financial institutions have specific requirements, so that the farmers sometimes get stuck on moneylenders or middlemen.

Farmers practiced farming activities in conventional way as showed in Figure 3. Although the government has tried to facilitate an extension of suitable technology for the agricultural work, most farmers are still reluctant to use it because they think they should pay more costs.

From the indicators of access to the market, most of farmers in the research area have sold their agricultural products through the middlemen. Farmers often not follow the agricultural extension provided by government and they prefer to follow their friends. Thereby, farmers are often failed to get a good harvest. The middlemen still play important role in traditional farming system practiced in the study area. This could disturb the suitable pricing policy in agriculture sector. In consequence, information received by farmers is often asymetry due to interrupted by the personal interests.

Most of farmers sell their agricultural products to the middlemen (Figure 4). This might be expalined by a weak bargaining position

Figure 2: Access to financial institution

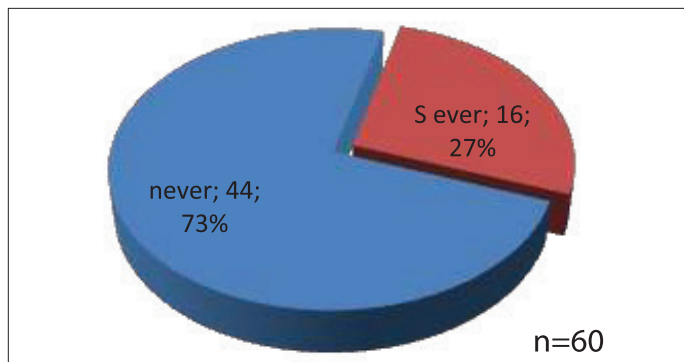


Figure 3: Access to technology

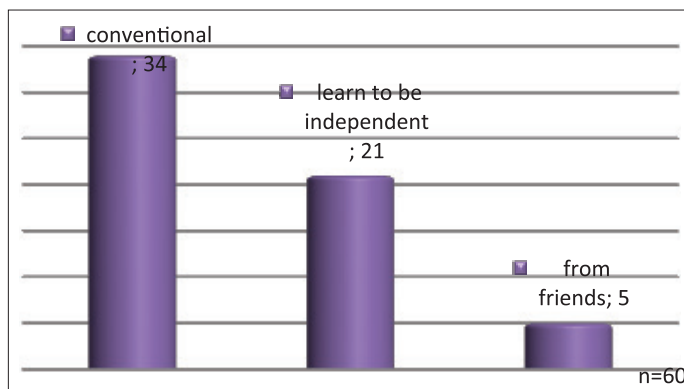
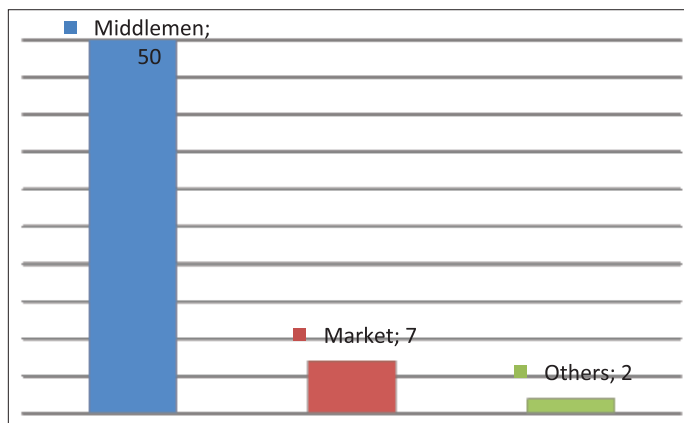


Figure 4: Access to market



of farmers, they could not sell at a price according to the market price at harvest time.

From the economic indicator of the empowerment level described above, the farmers in the research area are still very low. This could brought the farmer to a trap of a vicious circle of poverty. Therefore, farmers need to find out an alternative income without leaving the profession as a farmer such as maximisation in farming activity of "Mina-paddy" (combination of fish-paddy marming).

This study found that the farmers' fate in this country is getting gloomy, the farmers' life is getting poor. Various programs of agricultural extension are only a program without real

implementation. There are still many farmers who live with an average income of Rp. 300,000.00 - per month. The uncertain farmers' fate makes them choose another profession that is currently shown by the availability of various job opportunities in other field. The availability of factories, properties, modern markets and others make the farmers switch to the other potential profession. As a results of the census conducted by BPS revealed that there was a decline in the number of farm households of 31.17 million households in 2003 to approximately 26.13 million households in 2013. BPS concluded that within 10 years, Indonesia has lost 5.07 million households of farmers. Certainly there is a concern of the population of farmers in the future. It is inversely proportional to the growth of Indonesia's population from 2003 to 2013 that fingerling grew from about 215 million to more than 250 million people. Ironically, increasing number of population requires an adequate of food availability. The weak of bargaining power of farmers is generally caused by, (1) Farmers have less access to capital and have inadequate markets; (2) farmers face unfavourable price for their agricultural products due to lacks for marketing channels. Under such a system, about 40% of agricultural products were sold to middlemen.

The Mina-paddy farming (rearing fish fry and paddy together in one farming system) become as an alternative exit strategy to ensure the farmer's income improvement and could provide farmer to get income in daily basis. Therefore farmers will able to enjoy "salary" like a civil servant to receive monthly income. It should be noted that the Javanese people have a preference to have a job as civil servant (due to influenced of Dutch colonial doctrin). Therefore, with a proposed scheme of Mina-paddy to improve farmer's income should be very effective for the exit strategy.

Fish fry of tilapia, carp, black pomfret with age of 1-1.5 months can be produced from Mina-paddy farming business. This business is not necessary for additional farming construction of paddy. It is only needs to make a trench around the rice fields diagonally or crosswise. This trench serves as a refuge for fish and to facilitate harvesting. The size of the trench is generally 40-60 cm with a depth of 40 cm. Many species of fish reared are carp. This fish species grow well in shallow water and heat resistant. The sowing of fish seed is done after the rice is 5-7 days with the maintenance up to 1 month to 1½. Usually the land of Mina-paddy of 1 ha can be planted by 45,000 fish. Farmers buy fish at a dosage cup. One cup contains 1500-2000 fish fry for Rp 10,000 per glass. "One glass of fish will usually result in a minimum of 3 kg and a maximum of 10 kg of fish." This business is profitable for farmers. Because besides producing rice to be the main crop, they can also sell fish from Mina-paddy.

#### 4. CONCLUSIONS

Javanese farmers are known as hard working farmer in Indonesia. Farmers who migrated to out of Java island and practiced their farming system with ample land for cultivation such as in Sumatra, Kalimantan, Sulawesi, Papua, etc became a success farmers

with an excellent wealth. On the otherhand, many farmers in Java island from time to time is decreasing in wealth due to fractured land into smaller in size. It is to though in competing the land used for agriculture versus industry, estate, and property business in Java. Thereafter, the selected intensification agriculture program with innovation and creative-business must be outline to brakthrough the frontier of stagnancy in market. The demand of foods for modern people are very elastic following the life style of modernised people (recall for urban's style). This stipulate farming industry and its chains should be adjusted according the demand. However, the farming industry is inelastic due to the constraint of inputs in production such as land, labor, and other production's input in Java Island. Therefore, agriculture supply is hardly to follow the elastic consumers' demand behaviour. Once again, creative-innovative farming system and farming industry is one of the exit strategy to answered this matters. Lets to promote "Mina-paddy" to provide farmers "monthly salary."

#### 5. ACKNOWLEDGMENT

An utmost gratitude and appreciation is given to Universitas Negeri Semarang that has given the author an opportunity to accomplish this research.

#### REFERENCES

- Aushuria, R. (2013), Matinya Petani di Lumbang Padi. Available from: <http://www.ekonomi.kompasiana.com/agrobisnis/2013/04/11/matinya-petani-di-lubung-padi-550200.html>.
- Badan Pusat Statistik. (2014). Available from: <http://www.bps.go.id>.
- Christenson, J.A., Fendley, K., Robbinson, J.W. (1989), Community development. In: Christenson, J.A., Robinson, J.W., editors. Community Development in Perspective. Ames, IA: Iowa State University Press.
- Forum Group Discussion. (2014), FGD with the paddy farmers on July in Magelang, Central Java.
- Pary, M. (2011), Petani Indonesia Masih Miskin. Available from: <http://www.gerbangpertanian.com/2011/07/petani-indonesia-masih-miskin.html>.
- Gerbang Petani. Available from: <http://www.gerbangpetani.com>.
- Prajanti, S.D.W. (2014), Strategies for controlling agricultural land conversion of paddy by using hierarchical process analysis in central Java. *Management of Environmental Quality*, 25(5), 631-647.
- Pratiwi, I. (2012) *Usaha Pembibitan Jenis Ikan Unggulan*. Yogyakarta: Pustaka Baru Press.
- Riza, R., Roesmidi, M.M. (2006), *Community Empowerment*. Sumedang: Alqaprint.
- Susilowati, I, Kirana, M. (2008), *Pemberdayaan Masyarakat Pesisir*. Buku Ajar Berbasis Riset. Semarang-Indonesia: Fakultas Ekonomi Universitas Diponegoro.
- Susilowati, I., Waridin, W., Thohir, M., Winarni, T. (2004), Pengembangan Model Pemberdayaan Masyarakat Pesisir (Usaha Mikro, Kecil, Menengah dan Koperasi – UMKMK). In: *Mendukung Ketahanan Pangan di Kabupaten/Kota Pekalongan, Jawa Tengah*, Universitas Diponegoro, Riset Unggulan Kemasyarakatan dan Kemitraan (RUKK) Tahun I, Ristek, Jakarta.