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SINTA 2

Capacity Development of Madurese Female Farmers in the Implementation of Integrated Crop Management in Corn

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ABSTRACT

Women as housewives have a big role in managing their family economy. This study aims to: 1. Analyze the level of awareness of gender equality among female corn farmers, 2. Analyze levels of knowledge, attitude, and skill of female farmers in terms of PTT in corn, 3. Analyze the empowerment process, results, and impacts obtained by female corn farmers from farming school. The study was conducted in three regencies of Madura, namely Bangkalan, Sampang, and Pamekasan. Data were analyzed using descriptive quantitative analysis to answer the first and second objectives, and PAR analysis to answer the third question. Based on the results of the study, women's role is more dominant than men in several aspects. Some of them are activities in finance, post-harvest, and others. The majority of farmers adopt corn farming methods based on experiences from generations. Empowerment activities such as FGD and training have benefited female farmers.

Keywords*: Gender Equality, Female Farmers, Corn*

INTRODUCTION

Agricultural sector is still dominant compared to other sectors in Indonesian economy and strongly correlated to the big contribution of women. Based on the data from BPS of East Java, the Inter-Census Agricultural Survey (Central Bureau of Statistics, 2018) suggested that the number of female farmers in Madura was 23.16% of the total farmers in Madura (it was 178.014 female farmers). Compared to other regencies, Bangkalan has the highest number of female farmers, namely 35%. If it is added with the number of farmer's wives, most of them are housewives, the number can be greater. This is because housewives only consider this activity as a side job even though the activity has took very long hours.

The four regencies on Madura are corn producers, which are merely cultivated as garden crops or planted in large areas. Due to various training and technical guidance of PTT in corn, many

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farmers in Madura nowadays have begun to cultivate composite or hybrid corn in addition to local corn which is still preferred by most farmers. Although mostly farmers have motivation on farming in order to meet their family needs, such as daily needs and self-actualization (education fee, savings, etc), they make more efforts to intensify land with the target of high productivity (Kasim, 2019b) (Kotu et al., 2022).

According to Central Bureau of Statistics in 2018, the number of farm households is 670.386 people and about 23,22% of them cultivates corn as the main source of income from secondary crops. In 2017, corn harvested area in Madura reached 23,55% (296013,6 Ha) from total corn harvested area in East Java. Meanwhile, its production has only reached 10,06% (637,838 tons) in East Java. This suggests that corn has a very potential contribution in supporting East Java as the largest corn producer in Indonesia.

The potential for corn demand in Madura is getting higher either to meet local consumption for population in Madura or to meet the demands of feed raw materials and other processing industries in Madura, East Java, and Indonesia. Up until now, corn rice (combination of rice and ground corn) is still popular in this island. For some people in Madura, especially in rural areas, they feel like lack energy if they do not eat corn rice (Sugiarti & Hayati, 2009). The development and increased productivity of corn commodity is very necessary in order to strive for family food security and lower poverty in rural area of Madura.

Corn farming cannot be separated from the contribution of female farmers, although in reality there are limits and differences in the amount of participation with male farmers. Difference in access is a factor which cause inequality and give an impact on the weak control, benefits, and women participation (Fauziyah, 2018) (Mulyaningsih, 2018) (Pierotti et al., 2022).

The fact suggested that female farmers play a significant role in the application of PTT in corn, especially concerning the use of superior varieties, quality seeds, fertilization, and pest control (Rini Endang P et al., 2014). It is true that from perspective of gender role in corn farming, men are still dominant than women and this inequality results in unequal rights and opportunities for women. This inequality can be seen from the amount of wages earned and opportunities to enrich agricultural knowledge. Female farmers contribute to the planting, maintenance, and post-harvest stages with amount of wages earned from Rp35 - 50 thousands with working duration of 5 to 6 hours per day (Suaib et al., 2019). In terms of working hours, women as the economic basis of farm households have an average of 5.2 hours/day of working people (HOK) for management. However, their participation in the decision-making process is still low because they assumed to be lack of ability. This proves that paternalist culture is stillstrongly held by the community (Hutajulu, 2015).

The magnitude of corn farming contribution can be described as follows: male labor 29.97%, female labor 25.98% and children 11.73% (Kautsar et al., 2018). Working duration is also related to the income received by female farmers. The average income is 3-13 million rupiahs according to the area of land managed. The contribution of income earned by female farmers to family income is up to 56.83%, which is directly indicate that female farmers are very contributive to the family needs (Kasim, 2019a). While the duration of activities conducted by female farmers in the family takes a long time, such as (1) taking care of children (2) cooking (3) cleaning the house (4) washing clothes, and (5) drawing water with an average of 10 HOK (Maryani et al., 2018).

Several factors that can give a positive impact towards female activities in farming include personality, empowerment intensity, availability of information, physical and socio-economic

support (Mulyaningsih et al., 2018). Not only conducted separately, there is a significant correlation at the economic level in terms of farming activities conducted jointly by husband and wife (Setiadi, 2018). This is related to decision making in the sales of production. There is no compromise and gender domination. In villages with food insecurity, women are the decision makers by 40%, whereas in food-secured villages it is 59.46% (Aridala, 2010).

Increasing family income of female farmers also can be conducted through technology updates and entrepreneurship training activities. Technological updates for adding value to corn can be the use of corn shellers. This tool can be used as needed and affordable by all groups of farming community (Matsuki & Seputro, 2018). Taking advantage of the existing natural resources can be corn reprocessing to get more value-added and durable products. Therefore, training and guidance on how to process corn is required. There are more than 82% of female farmers who understand and want to start a business after getting assistance on entrepreneurship trainings (Yolanda & Honesty, 2020). The entrepreneurship level of farmer also directly affects the efficiency level of farming technique (Sugiarti, 2015).

This study aims to: 1. Analyze the level of awareness of gender equality among female corn farmers, 2. Analyze levels of knowledge, attitude, and skill of female farmers in terms of PTT in corn, 3. Analyze the empowerment process, results, and impacts obtained by female corn farmers from farming school.

METHODOLOGY

The study was conducted in three regencies of Madura, namely Bangkalan, Sampang and Pamekasan, with consideration that Madura is one of the largest corn producers in East Java. The study was conducted from May to November 2021.

This study uses primary and secondary data. Primary data were collected through interviews with female farmers and wives of corn farmers in Madura. In order to deepen the study, a focus group discussion will be conducted with key informants from academics, female farmers, and the Department of Agriculture. Secondary data was obtained from data and reports ofthe related agencies and scientific articles.

RESULTS AND DISCUSSION

Level of Awareness of Gender Equality

Material on understanding gender equality was given in two villages of Bangkalan Regency, namely in Paka'an Laok Village, Galis Sub-district and Duko Tambin Village, Tragah Sub-district. Before the material is delivered by the researcher, the FGD participants consisting of female farmers admitted that their level of awareness was very low. Several things they realized after the delivery of material with case studies were their right to be well treated by their husbands as life partners and the fight against domestic violence. In addition, attending farming school for women is also their right so that they can improve their quality of life. Gender role in corn farming will be discussed below.

Gender Role

The gender concept focuses on the different roles between men and women, which are formed by the community in accordance with the socio-cultural norms and values of the local community. Gender is influenced by interactions in the residential, social and cultural environment of each community which varies and changes from time to time. Women are involved, whether directly or indirectly, in managing business activities to improve family welfare. Women have a very important role both in farming and in household. Besides men, women have a very significant contribution in life, both in productive and reproductive activities.

From pre-harvest, harvest, and post-harvest activities, it is showed that men and women were equally involved in farming activities. The majority of farming activities in the study area use a system

of togetherness in farming. Based on the study, about 60% of activities are carried out jointly, such as selecting commodity types, planning production input requirements, labor selection, financing, farming execution time, fertilization, planting, watering, harvesting, shelling, packaging, and controlling. Especially for land cultivation, land clearing, and pest control are predominantly managed by men (32%), while women are more dominant in sales (8%).

This study describes differences in labor division between men and women from characteristics of their work. Work done by men is considered as physically heavy work, while women conduct jobs that require precision.

Table 1
Percentage of Activities Based on Gender Roles

Activities	Men and Women	Men	Women
Selecting commodities	63.33%	20.00%	16.67%
Planning requirements of production inputs	56.67%	20.00%	23.33%
Planning labor requirements	40.00%	26.67%	33.33%
Estimating cost requirements	56.67%	6.67%	36.67%
Planning farming time	46.67%	26.67%	26.67%
Land cultivation	6.67%	90.00%	3.33%
Land clearing	10.00%	86.67%	3.33%
Fertilization	53.33%	33.33%	13.33%
Planting	56.67%	26.67%	16.67%
Watering	50.00%	36.67%	13.33%
Weeding	50.00%	36.67%	13.33%
Pest control	36.67%	53.33%	10.00%
Harvesting	63.33%	0.00%	36.67%
Drying	50.00%	0.00%	50.00%
Shelling	53.33%	0.00%	46.67%
Packaging	60.00%	10.00%	30.00%
Selling	23.33%	16.67%	60.00%
Controlling	43.33%	30.00%	26.67%
Harvest checking	56.67%	3.33%	40.00%
Participating farmer group	26.67%	40.00%	33.33%
Participating extension activities	23.33%	43.33%	33.33%
Active discussion with extension workers	20.00%	43.33%	36.67%

Source: Primary data Processed, 2021

Farming implementation is potentially causing a bias between men and women in their work. In various farming activities, it is possible for women to be given special opportunities to ensure equal access to benefits. It is important to consider various opportunities and obstacles that exist for men and women to participate jointly.

The dominant role of women is in financial and post-harvest activities. However, the most dominant activity is in sales (almost 60%), followed by drying (50%), packaging (46%), checking harvest production and harvesting (37%). This is also in line with post-harvest activities that require fast and careful handling, where these characteristics are showed by women.

Gender Opportunities and Roles

Access is an opportunity held by women and men to do, own, and enjoy goods and services. Men have greater opportunities outside of farming such as in trade, construction, and industry sectors because their income is greater than agricultural sector. This creates a greater opportunity for women to be involved in rice farming. In the study area, women's

opportunities are greater than men (almost reaching 35%), although it is also open to activities conducted jointly (59%).

Access to these resources and benefits affects women potential in corn farming. This potential includes women's capacities such as education, skills, experience and capacity for gender relations. Meanwhile, what are included in women opportunities of farm household are markets and corn farming development programs which ultimately can upgrade women status in the farm household.

Table 2
Gender Opportunities in Corn Farming

Activities of Farming Opportunity	Men and Women	Men	Women
Land use	73.33%	6.67%	20.00%
Capital use	53.33%	6.67%	40.00%
Use of production inputs	80.00%	3.33%	16.67%
Use of agricultural products	46.67%	0.00%	53.33%
Supply of production inputs	16.67%	56.67%	26.67%
Marketing	40.00%	3.33%	56.67%
Timing of sales	30.00%	10.00%	60.00%
Determining point of sale	33.33%	3.33%	63.33%
Determining output sold	36.67%	6.67%	56.67%
Labor selection	36.67%	33.33%	30.00%
Land cultivation	63.33%	13.33%	23.33%
Financial management	33.33%	0.00%	66.67%
Participation in extension activities	40.00%	36.67%	23.33%
Determining planting commodities	53.33%	16.67%	30.00%
Determining agricultural management strategy	60.00%	23.33%	16.67%

Source: Primary Data Processed, 2021

Women still dominate financial, harvest and post-harvest activities. The first order is financial management (66%), determining point of sale (63%) and determining sales timing (60%). Husband's access to production factors is higher than wife's. Shared access to land use, use of production inputs, land cultivation and strategy determination is higher based on the fact that men are the main breadwinners for the family. Meanwhile, the wife also has access and works but its role is only supporting family income.

Gender Role in The Decision Making

The status of gender equality in the implementation of corn farming is unequal because in majority the control levels over the farming implementation between men and women are different. It can be seen from the table that the joint decision-making role is equivalent to the women role (43%).

The decision-making in corn farming is conducted based on deliberations or discussions between men and women. Thus, the decision making is conducted together but there are decisions that are dominated by men and some are dominated by women. However, there is also an equal decision making.

Table 3
Decision Making Based on Gender

Activities	Men and Women	Men	Women
Capital for Production Inputs	40.00%	10.00%	50.00%
Use of Production Inputs	40.00%	23.33%	36.67%
Agricultural products for fulfilling family needs	43.33%	3.33%	53.33%
Supply of agricultural inputs and raw materials	13.33%	53.33%	33.33%
Timing of sales	26.67%	3.33%	70.00%
Determining point of sale	30.00%	3.33%	66.67%
Determining output sold	30.00%	3.33%	66.67%
Labor selection	33.33%	36.67%	30.00%
Land cultivation	56.67%	30.00%	13.33%
Non-agricultural business management	70.00%	16.67%	13.33%
Participation in extension activities	33.33%	33.33%	33.33%
Determining planting commodities	56.67%	23.33%	20.00%
Determining agricultural management strategy	76.67%	6.67%	16.67%

Source: Primary Data Processed, 2021

Decision making related to supply of agricultural inputs, labor selection and land cultivation is dominated by men. Meanwhile, women dominate sales and fulfillment of family needs. Joint decisions are also made on activities regarding non-agricultural business management, land cultivation, and management strategies. However, this is also dominated by men because they shared more knowledge on agriculture than women due to husband's frequent involvement in community activities, especially agricultural extension and farmer groups.

Level of Knowledge, Attitudes, and Skills of Female Corn Farmers

Integrated Plant Management (PTT) is an approach which focused on integrated and location-specific management of plants, land, water, and plant-disturbing organisms (OPT). It uses an applied technology to solve farming problems in certain areas and is site-specific with the help of extension workers and agricultural officers. The main purpose of PTT is to increase production, income, and welfare of farmers, as well as sustainably maintain or increase corn productivity and production efficiency.

There are several factors that influence female farmers in implementing plant management technology from internal and external aspects, namely knowledge, motivation, easy access to information, technology and production infrastructure (Prasetyowati, 2017).

The development of PTT in specific location always pays attention to the condition and situation of local resources, thus the technology applied in one location will be different from other locations. The applied technology with PTTapproach is synergistic and site-specific in characteristic. In accordance with problems that exist in the local area, the technological components that can be developed with PTT in corn include superior varieties, quality seeds, energy-saving land

preparation, optimal plant population, efficient fertilization, pest control by prioritizing environmental sustainability aspects, harvest and post-harvest management, in accordance with the socio-economic conditions of the community.

In the study location, farmers tend to still follow the old cultivation method that pay less attention to modern agricultural technology. This farming method is still being practiced until now because it is considered faster even though the results are not optimal. One of them is a method used to arrange spacing by following cow tails while plowing the fields. Thus, the distance between corn plants is uncertain and relatively very close from one plant to another. So, this is the case in the selection of seed varieties to be planted. 90% of respondent farmers prefer to use local seed varieties. Farmers get local seeds through various ways, such as using seeds from previous harvests and also buying them at the market. One of the determining factors for using local seeds is the longer shelf life for local corn. The other factor is the taste. Farmers are tend to prefer local corn and this also becomes a determinant for selecting local varieties.

Respondent farmers (97%) are unaware that local hybrid seeds can increase production output. The quality seeds used in the cultivation process should come from healthy plants to avoid pest attacks. All respondent farmers have used hand tractor technology for cultivating soil. However, farmers still use the No Tillage (TOT) concept so that very few of them loosen the soil by plowing (13%). At the stage of loosening the soil, farmers only put straw on the land as fertilizer.

The TOT application can shorten planting time and save production costs. The application of TOT planting system has an efficiency duration of 15-20 days and even 30 days compared to the OTS planting system. There are several advantages of TOT system, namely (1) Shortening the duration of cultivation because farmers do not need to cultivate the soil (2) Saving labor costs (3) Avoiding damage on soil due to the loosening process because in the long term it will make soil harden and potentially loss its minerals. However, there are also disadvantages of this method, such as (1) it potentially grows weeds that can interfere with the plant (2) allows for the remnants of pests to reproduce on the land and can interfere with further plant growth.

The TOT planting system is often applied by farmers for corn cultivation which is usually done after harvesting rice. Rice straw is used as mulch. The TOT system in corn cultivation can save production costs to a minimum, thus giving opportunities for greater profits.

Fertilizer use in the study location is still minimal. Corn requires a complete fertilizer with a mixture of urea, SP-36, ZA, and KCl. Only 36% of respondent farmers use complete fertilizers. Most of them only use manure (66%) and do not use spraying concept for fertilization (90%).

Most of respondent farmers know when is the best time to harvest (56%), the characteristics of harvested corn (60%), and theallocation of harvest products (70%), but their knowledge on post-harvest stage is still low (53%). Respondent farmers do not know the right post-harvest treatment to get maximum results.

Farmers' knowledge on pest and disease control is also relatively little. This is what makes people actually hunt for animals and insects that are beneficial for corn plants, like snakes, grasshoppers, and birds which are hunted for food or for sale. This makes pests like rats, caterpillars, army caterpillars and others attack corn plants. The plants are also suffered from Caucasian disease due to the unavailability of proper water channels.

Post-harvest is an important stage in corn farming. The corn post-

harvest process consists of a series of activities starting from picking and drying, shelling, packaging, and storing seeds before being sold to collectors. The process requires skill and supervision to maintain the output quality. If the process is not properly handled, the quality of product will not be optimal due to the change in seed color because of fungal infection, corn spoils, mixed with foreign objects so it is not good for health.

Post-harvest treatment conducted by respondent farmers was still limited to simple activities, such as using sack for packaging (93%). Respondent farmers (66%) do not sell their crops at low prices but keep it stored until the price goes up. This is not comparable to the knowledge of respondent farmers (63%) who do not know the duration of effective storage even though they understand (93%) that shelf life affects the corn quality.

Empowering Women Farmers

The empowerment process of female farmers in the form of FGD and training conducted in Paka'an Laok Village, Galis Sub-district and Duko Tambin Village, Tragah Sub-district, Bangkalan Regency includes; 1. Coordination with local agricultural extension workers regarding the empowerment for female farmers, 2. Coordinating participants to participate in empowerment activities, 3. Organizing the first FGD to detect what are needed by female farming community, 4. Preparing empowerment activities, so that each participant really gains knowledge, materials needed in practical activities both in location where the empowerment takes place as well as in their respective environment (such as: seeds, organic fertilizers, and other tools), and 5. Preparing the second FGD and training on organic vegetable cultivation as well as how to make POC and Eco Enzyme.

Based on the results of FGD conducted, the school activities for female farmers in Duko Tambin Village, Tragah Sub-district, Bangkalan Regency include counseling on proper local corn cultivation, training on vegetable cultivation and how to make POC. The training in Paka'an Laok Village, Galis Sub-district, Bangkalan Regency also includes training on vegetable cultivation and how to make POC and Eco Enzymes.

Empowerment activities in the form of FGD and training were considered as beneficial for female farmers. Female farmers are becoming more aware of their rights to get education, both formal and non-formal, like this empowerment activity. The understanding of gender equality makes them more open to female farmer's capacity building regardless of gender differences. Community of female farmers gets a lot of new knowledge on the application of PTT (Integrated Crop Management) in Corn delivered by training presenters. This knowledge is very useful to be applied by female farmers for the next corn planting regarding their significant role in the corn cultivation process in Madura.

CONCLUSION

Based on the study results, women's role is more dominant than men in many aspects. Some of them include their activities in finance, post-harvest stage, and others. For example, the most dominant activity is in sales (almost reaches 60%). The levels of knowledge, attitude, and skill of female farmers in terms of PTT in corn is still lacking (approximately 93%). The management of corn farming is not in accordance with the procedures that should be applied from seed selection, planting, fertilization to harvesting. On average, the farming time of female farmers reaches 15 years, so that it becomes a reference that the management implemented is based on experience because it has been

conducted for generations. Empowerment activities in the form of FGD and training were considered as beneficial for female farmers. The understanding of gender equality makes them more open to female farmer's capacity building regardless of gender differences. Applicative training makes them admit that this kind of training is very useful and can increase their household economic status in the future.

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