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Oleh:

Moh. Rum, Aminah Happy Moninthofa Ariyani, Riyanti Isaskar

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The Role of Self-Help Extension in the Development of Moringa in Sumenep District, Madura

Moh. Rum^{1*}, Aminah Happy Moninthofa Ariyani², Riyanti Isaskar³

^{1,2} Universitas Trunojoyo Madura

³ Universitas Brawijaya Malang

^{*)}Correspondence email: me.arrumy@gmail.com

ABSTRACT

This research aims to: 1). Describe the performance of moringa-based farming and agro-industry in Sumenep Regency, Madura; 2). analyzing the role of self-help extension workers (CV. Pusaka Madura) in developing moringa in Madura. The analytical method used is a qualitative descriptive method. The analysis results show: 1). Moringa farming and moringa processing in Sumenep Regency, Madura is carried out by farmers who are members of farmer groups under the guidance of self-help extension institutions, namely CV. Pusaka Madura and Nurul Jannah Farmers Group; 2). Community-based self-help extension workers play the role of educators, facilitators, motivators, and technicians in the development of moringa in Sumenep Regency, Madura.

Keywords: Self-help extension workers, moringa, farmer groups, Madura

INTRODUCTION

The availability of government extension workers (PNS extension workers) is decreasing from year to year, resulting in low adoption of technological innovation by farmers. Farmers become less empowered in facing changes in the farming sector. The existence of extension workers plays a very important role in assisting farmers in solving farming problems. Law Number 19 of 2013 concerning the Protection and Empowerment of Farmers states that it is difficult to provide at least one extension agent for each village.

Ideally, agricultural extension workers can become motivators, dynamists, facilitators, and consultants for farmers (Tjitropranoto 2003; Subejo 2009). Agricultural extension workers must also be able to diagnose problems faced by Kalyan (farmers), build and maintain relationships with the Kalyan system, strengthen adoption, and prevent adoption termination (Rogers 2003). Syahyuti (2014) stated that the right instructors at this time who can be relied upon in conveying the message of innovation are instructors who come from the farmers themselves.

Independent extension workers who come from the community who have knowledge and skills in farming, product processing, and marketing can play their role as instructors for other farmers, which is the peak form of participation of a farmer in agricultural development (Ghimire 2009). Such farmers and farmers who have leadership qualities, become role models for main actors, and business actors are grouped as self-help extension workers (Permentan 68 of 2008). Farmers with these advanced characteristics then act as independent extension workers and carry out extension services independently.

Independent extension workers can play a role in carrying out outreach to farmers in their communities well so that the process of disseminating technological innovations and farmer-to-farmer learning systems tends to be smoother and more sustainable (Lukuyu et al. 2012). A fairly reliable role that can be played by self-help instructors is that of providing motivation (Riana et al. 2015; Samuel et al. 2012, Kiptot et al. 2014). The tendency for successful dissemination of innovation by independent extension workers to their communities is quite high, especially if they become trainers for farmers (Lukuyu et al. 2012; Kiptot et al. 2014).

In Madura, self-help outreach activities are often carried out by farmer groups, community leaders, and Islamic boarding schools. In general, they are successful and advanced farmers, making it possible for the government to continue to develop their potential so that they can also advance the farmers around them. This is by the research results of Semakula and Mutimba (2011) which stated that independent extension workers can bring change to farmers. The same opinion was expressed by Lukuyu et al. (2012); Syahyuti (2014) states that independent extension workers have the potential to disseminate technological knowledge to farmers.

Moringa oleifera Lam (synonym: *Moringa pterygosperma* Gaertner), which we know as Moringa, is an agricultural commodity that has high nutritional value, because it contains active ingredients such as tannins, steroids, triterpenoids, flavonoids, and has potential benefits (Halima & Mbulang, 2016; Wasonowati, et.al., 2019). Moringa is also a plant with economic value, so it can be used as a source of income for the community, and can absorb labor in rural areas through farming and agro-industrial activities. Export demand for dried Moringa leaves to

Japan is 4 tons per month. With the growing demand for Moringa as a raw material for the medicine industry and functional food processing industry, the demand for Moringa is increasing. Moringa as an agribusiness commodity can be used as a source of livelihood for farmers because the roots, leaves, fruit, and flowers of Moringa can be used as food, medicine, wastewater purifier, animal feed, daily consumption, functional food, and cosmetics (Symbolan and Katharina, 2007). Moringa leaves contain forty-six powerful antioxidants, namely compounds that protect the body against the damaging effects of free radicals by neutralizing them before they can cause cell damage and disease (Krisnadi, 2014). During the COVID-19 pandemic, Moringa was widely used to improve the immune system and treat various diseases. Moringa throughout the world is well known as an alternative food to overcome malnutrition (Broin, 2010). The development of moringa in developing countries contributes to the economic sustainability of society and reduces poverty.

In Bluto District, Sumenep Regency, there are around 12,500 Moringa trees and they are cultivated semi-intensively (Wasonowati, et.al., 2018). Meanwhile, in Guluk-guluk District, it is planted on the moor and only used for land borders (Rakhmad, 2014). Two types of Moringa grow in Madura based on the color of the leaf stalks and the chemical content, namely red and green (Barselia et.al., 2014). In terms of agroclimate, Sumenep Regency is suitable for the development of Moringa plants and farmers are starting to be interested in making Moringa a plant that drives the rural economy (Disperta Sumenep Regency, 2014).

Based on the above background, this research aims to: 1). Describe the performance of moringa-based farming and agro-industry in Sumenep Regency, Madura; 2). analyzing the role of self-help extension workers (CV. Pusaka Madura) in developing moringa in Madura;

RESEARCH METHODS

Primary data in this research was collected using in-depth interviews, correspondence, and Focus Group Discussion (FGD). Interviews were conducted to obtain information from stakeholders including the chairman of CV. Pusaka Madura, Chair of the Nurul Jannah Farmers' Group, "Bina Bhakti" and "Nurul

Jannah" farmers' groups, Bluto sub-district Agricultural Extension Center (BPP), Sumenep Regency Food Crops, Horticulture and Plantation Service, and academics. Data analysis uses qualitative descriptive analysis.

RESULTS AND DISCUSSION

Moringa Farming and Agroindustry Performance in Sumenep Regency

Below is the distribution of Moringa plants in the areas supported by independent extension workers.

TABLE 2. DISTRIBUTION OF MORINGA PLANTS IN THE SUBDISTRICT "BINA BHAKTI" FARMER GROUP

Village	Number of Moringa Plants (Trees)
Pekandangan sangra	2.800
Pakandangan Barat	2.625
Kapedi	2.350
Pakandangan Tengah	2.675
Aing Dangke	2.050
Total	12.500

Source: documentation. CV. Pusaka Madura, 2021

CV. Pusaka Madura was founded in 2015 by 15 workers. Every day, we process Moringa into flour and Moringa tea. The average production capacity is 2.5 quintals of Moringa leaves, the raw materials for which come from farmers, with a purchase price of IDR 2,500/kg. So far, the drying process has been carried out naturally (without using a drying machine), while for flouring into Moringa flour a flouring machine is used.

Moringa processing technology into a variety of functional foods, herbs, Medicines, and cosmetics has developed in the world and Indonesia. Moringa leaves, which initially had no economic value, then became of relatively high economic value and obtained higher added value and provided increased income to the community and were able to absorb labor in rural areas from the results of the Moringa agro-industry. Until now, unfortunately, Moringa agro-industry business

opportunities in Madura have not developed well. There are several problems faced by Moringa farmer groups, including:

a). Aspects of cultivation technology.

Most Moringa plants in Madura are not cultivated intensively, so their productivity is very low (Isdiantomi et.al., 2018). The cultivation standard required for processed Moringa products is to use raw materials originating from organic Moringa cultivation. The lack of knowledge and skills of farmers in producing organic production inputs (fertilizers and pesticides) has contributed to the lack of realization of organic Moringa cultivation. Moringa cultivation is largely not carried out by farmers in the Bluto District by Good Agricultural Practices (GAP) and SOP for organic moringa cultivation. The low quality of commodities and products also has an impact on the low selling prices of CV Pusaka Madura processed moringa products. CV. Pusaka Madura is on the market compared to other companies in Indonesia, such as PT. MOI Blora, Central Java Province. The limited knowledge of farmers regarding how to cultivate moringa means that action to develop moringa as a commodity with high economic value in Sumenep Regency is still low. Moringa plant production is influenced by pruning because pruning will encourage the growth of moringa branches (Holst, 2000).

b). Production technology aspects.

The drying technology used is still simple and conventional, namely naturally relying on wind conditioning by exhaust fans and room blowers. Until now, a Moringa leaf drying machine has not been used that complies with Indonesian National Standards (SNI). To obtain quality raw materials for processed Moringa production, proper harvest and post-harvest handling are required (Akbar et.al., 2019). Continuous supervision and quality control according to standard operating procedures (SOP) is important to disseminate to partner farmers to ensure good and stable quality of raw materials. Knowledge about the criteria for Moringa leaves is not fully understood by farmers. Drying is the most important key in the production of processed moringa. The drying room temperature is maintained at 30-35 °C with humidity made up to 46% RH for two days until completely dry or 5% moisture content (Agricultural Research and Development Agency, Ministry of

Agriculture, 2018). Factors that can influence the drying process are the drying technique (temperature, time, humidity, air circulation), material thickness, and material stack (Directorate of Indonesian Original Medicines, Food and Drug Supervisory Agency, 2016). With natural drying methods, the ideal room temperature and humidity suitable for moringa production are difficult to achieve. Drying techniques and drying equipment/technology will determine the yield of moringa.

The process of storing dried Moringa leaves also determines the quality of processed Moringa products. Storage method on CV. Pusaka Madura has not been carried out properly, thereby reducing the quality of Moringa's raw materials. Process of flouring dried Moringa leaves at CV. Pusaka Madura already uses a stainless steel flouring machine, but it does not meet the standards for a good moringa processing machine, namely, it is not equipped with a cooling machine and stainless steel sieve.

c). Packaging aspects.

CV. Pusaka Madura uses laminated aluminum foil and thick plastic. For moringa capsules, plastic bottles are used. Attractive packaging will influence consumer purchasing decisions (Harminingtyas, 2013). One of the functions of packaging is to promote products and attract consumers' interest in buying the product. Packaging is also a tool for differentiation and helps consumers decide on a product from a variety of parallel products, and packaging also stimulates customer purchasing behavior (Raheem, Vishnu, & Ahmed, 2014). Consumers tend to choose food products with attractive packaging, compared to simple or plain packaging (Rum, 2017). Consumers find a product attractive due to the attributes offered, the information provided through packaging, comparisons with competing products, the reputation of the company that makes the product, and the technology used to make the product (Muharam and Sofian, 2011).

CV. Pustaka Madura has a low sales rating in the marketplace compared to other similar products. Packaging design also influences consumer purchasing decisions (Rum, 2017). The use of digital technology and variations in packaging types have a positive effect on sales of MSME products.

d). Marketing aspect

Online sales via Shopee and Lazada have also been carried out, however, sales volume is relatively small due to price competition with similar products and less attractive product performance, especially in terms of packaging. A small portion of the products are also sold abroad, including to Singapore and Germany, but export sales are only made if there are orders and purchases by Madurese residents who work as female workers (TKW) abroad as typical Madurese souvenirs.

e). Aspects of product standardization

Specific quality parameters of *Moringa simplicial* include soluble essence content, determination of infrared, macroscopic, and microscopic spectrum profiles, and determination of spectrum profiles. Determination of non-specific levels of moringa includes water-soluble ash content, total ash content, drying loss and pH, and acid-insoluble ash content. The colorimetric method was used to determine the levels of flavonoids, phenols and alcohols in *Moringa Simplicia* leaves (Bata et.al., 2018).

There is a growing opinion that Moringa leaf tea is useful for warding off Covid 19, but Moringa leaf tea has never been clinically tested to ward off Covid 19. However, Moringa can increase the body's immunity and with good body immunity, the virus will not easily attack the body quickly. Moringa is a functional food that is highly nutritious and rich in phytochemicals and is a superfood that is useful for increasing immunity and warding off free radicals as well as diseases and viruses (Bata et.al., 2018). The weakness of Moringa leaf tea is that it has an unpleasant taste (Kholis, 2010).

Moringa leaf capsules produced by CV. Pusaka Madura has been standardized by BPOM. Pusaka Madura and marketplaces such as Shopee and Tokopedia. Even though it has permission from BPOM, consumer demand is relatively small due to ineffective promotional media and the product price is relatively expensive, namely Rp. 65,000- per bottle (contains 60 capsules) weighing 250 grams. The price of a similar product, for example, the Inayah brand of Moringa leaf tea from Banjarmasin, South Kalimantan costs only IDR 34,000 per bottle

(contains 60 capsules). The high sales price is caused by the Moringa leaf capsule production capacity is relatively small with production costs still high.

The Role of Sawdaya Agricultural Extension in Bluto District, Sumenep Regency

Law No. 16 of 2006 has contained a new paradigm for agricultural extension in Indonesia. According to this law, agricultural extension activities are not only carried out by the government but can also be carried out by the private sector or independent organizations. Self-help extension workers are the main actors who are successful in their businesses and other community members who, with their awareness, are willing and able to become extension workers.

Based on Law No. 16 of 2006, self-help extension workers have the following duties: a). prepare extension plans that are integrated with extension programs; b. to form institutions for the main actors and business actors; c. establish business partnerships with various parties based on mutual benefit; d. convey business information and technology to fellow key actors and business actors; and e. carry out a learning process through piloting and developing farming business models for main actors and business actors.

With the existence of Law No. 16 of 2006, agricultural extension activities are no longer monopolized by the government, private parties, and independent organizations such as CV. Madura Heritage and the Nurul Jannah farmer group in Bluto District, Sumenep Regency. These two farmer groups are actively carrying out farmer empowerment activities, especially for the development of Moringa plants.

As an institution rooted in society, farmer groups are more effective in encouraging community participation. CV. Pusaka Madura has succeeded in inspiring the community to develop moringa as a commodity with high economic value. Moringa development in Sumenep Regency is carried out by individual farmers, farmer groups, and Micro, Small and Medium Enterprises (MSMEs). One of the MSMEs that uses moringa as a business commodity is CV. Pusaka Madura, Pakandangan Sangra Village, Bluto District, Sumenep Regency, which processes Moringa leaves into Moringa leaf powder, Moringa leaf capsules, and Moringa leaf

tea. CV. Pusaka Madura collaborates with farmers who are members of the "Bina Bhakti" farmer group. Moringa farming activities are carried out by the "Bina Bhakti" farmer group by the cultivation standards determined by CV. Pusaka Madura.

CV. Pusaka Madura was founded in 2015 by 15 workers. Every day, we process Moringa into flour and Moringa tea. Capacity The technology for processing Moringa into a variety of functional foods, herbs, medicines and cosmetics has developed throughout the world and in Indonesia. Moringa leaves, which initially had no economic value, then became of relatively high economic value and obtained higher added value and provided increased income to the community and were able to absorb labor in rural areas from the results of the Moringa agro-industry. The average production is 2.5 quintals of Moringa leaves, the raw materials for which come from farmers, with a purchase price of IDR 2,500/kg. So far, the drying process has been carried out naturally (without using a drying machine), while for flouring into Moringa flour a flouring machine is used.

CV. Pusaka Madura and the Nurul Jannah Farmers Group also assist farmers in marketing dried Moringa leaves and processed Moringa products. Moringa processed products are marketed in the Madura region and several districts in East Java through outlets owned and/or supported by CV. Pusaka Madura and the Nurul Jannah Farmers Group. Online sales via Shopee and Lazada have also been carried out, however, sales volume is relatively small due to price competition with similar products and less attractive product performance, especially in terms of packaging. A small portion of products are also sold abroad, including to Singapore and Germany, However, export sales are only made if there are orders and purchases by Madurese residents who work as female workers (TKW) abroad as typical Madurese souvenirs.

In guiding independent extension farmers in Bluto District, Sumenep Regency, they also collaborate with the Sumenep Regency Food Crops, Horticulture and Plantation Service, Trunojoyo Madura University, and a private company, namely PT. MOI in Blora Regency, Central Java.

According to Syahyuti (2014), the presence of local figures will be more able to produce interactive participation, where the community plays a role in the

analysis process for planning activities and strengthening institutions and the community has a role in controlling the implementation of decisions taken. Farmers are always involved in the decision-making process, for example determining production standards, determining selling prices, and developing Moringa products.

In the Bluto sub-district, apart from the Moringa plant, it also has the potential for cabu chilies which are quite well known. The general problem in herbal chili farming is that not many people cultivate this plant intensively and not many activities have been carried out to process herbal chilies into products that have greater added value. CV. Pusaka Madura and the Nurul Jannah Farmers Group are trying to process herbal chilies into herbal chili coffee (Suhardi, 2020).

The involvement of independent extension workers in Bluto District as partners of the government has had a positive impact on agribusiness activities in Bluto District, especially for the development of Moringa and herbal chili plants. Some of the roles carried out by independent extension workers include;

1). Educator

Independent extension workers have a role in transferring the knowledge, skills, and technology they know to farmers. Basuki Rahmat who is the head of CV. Nurul Jannah and Nurdi, who are the heads of the Nurul Jannah farmer group, gained knowledge, especially in the fields of agribusiness and agro-industry, through various training activities, courses, workshops and personal experience in farming moringa and herbal chilies. Most farmers consider these two farmer figures to be teachers in the field of agriculture.

2). Facilitator

One of the roles of self-help extension workers in Moringa agribusiness is as a facilitator. A facilitator is a person who provides facilities, namely facilitating the needs of other farmers, especially in agribusiness activities. Self-help extension workers establish a partnership with PT. MOI in Blora Regency, Central Java. Self-help extension workers facilitate farmers in selling dried Moringa leaves and processed Moringa products. Apart from that, the farmer group brought in the production facilities needed by farmers, such as moringa seeds, fertilizer and moringa processing machines.

3). Motivator

Self-help extension workers have a role as motivators, this can encourage farmers to be more enthusiastic in implementing agribusiness activities. Motivation is given in the right way to increase enthusiasm and encourage farmers to carry out their activities.

4). Technician

Self-help extension workers act as technical experts in designing methods and applying production equipment/technology, both related to the cultivation and processing of Moringa. According to Mardikanto (2002), extension workers also play a role in choosing the most appropriate technological alternative, which is technically feasible, economically profitable, and acceptable to local socio-cultural values (Mardikanto, T, 1992)

CONCLUSION

Moringa farming and moringa processing in Sumenep Regency, Madura is carried out by farmers who are members of farmer groups under the guidance of self-help extension institutions, namely CV. Pusaka Madura and the Nurul Jannah Farmers Group.

Community-based self-help extension workers play the role of educators, facilitators, motivators, and technicians in the development of moringa in Sumenep Regency, Madura.

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