Young Farmers in Action

The Future of Horticulture and Its Challenges in East Nusa Tenggara

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Abstract. The purpose of this study was to look over young farmers' entrepreneurial behavior and attitude toward challenges in agriculture. Data collection was done through semi-structured interview. This study involved 50 young horticultural farmer respondents in 10 regencies of East Nusa Tenggara. The result of this study revealed that young farmers looked onto some issues toward their marketing process during covid-19 pandemic. Therefore, the collaboration among young farmers in East Nusa Tenggara was required. Furthermore, the implication of IT in agriculture was necessary to increase agricultural product in spite of the post-harvest processing. Theoretical and practical inferences of the findings are also considered along with recommendations for refinement farmer regeneration by the ministry of agriculture.

Keywords: Entrepreneur behavior · Young horticultural farmer

1 Introduction

Horticultural commodities make a significant contribution to the national economy, especially during the COVID-19 pandemic. This indicator is shown by the contribution of the horticultural sector to Gross Domestic Product (GDP), employment and the increase in the volume and value of exports of horticultural products. Sobir [1] said that people are increasingly aware of the benefits of fruits and vegetables that contain lots of vitamins, in order to increase the body's immune power in the face of this pandemic that has not yet subsided. Horticultural agribusiness consisting of fruit, vegetables, ornamental plants and medicinal plants is superior because of its high selling value, variety of types, availability of land and technology resources, as well as market potential both at home and abroad which continues to increase. The supply of national horticultural products is directed to meet the needs of domestic consumers, either through traditional markets, modern markets, or export markets [2].

The challenges of horticultural agribusiness include the low production, productivity and quality of horticulture. Based on data from the Director General of Horticulture [2], this is caused by the capacity of human resources, institutions, and technology. In terms of agricultural human resources, the age of the farmer is one of the factors that will affect the sustainability of farming. Age is closely related to psychological, biological,

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potential and sensitivity levels in running a farm [3]. Several studies have shown that farmer age is strongly related to managerial ability in farming [4], business orientation and efficient business [5] as well as views on farming sustainability [6].

According to Susilowati [7] the demographic structure of farmers, which is more dominated by older farmers (more than 55 years) and on the other hand, the decreasing number of young workers is a major problem for human resources in agriculture in Indonesia. Agricultural census data in 2003 and 2013 as well as the results of the inter-census agricultural survey [8] show that the composition of the agricultural workforce is dominated by workers aged over 44 years [8]. This shows that young people's interest in working in agriculture is still low. In addition, the low level of education of workers in the agricultural sector is also still a classic problem in the agricultural sector [7].

However, it is a very big opportunity for young people to work in agriculture. With a large market opportunity and a smaller number of players, it becomes a challenge and opportunity for a businessman who wants to enter the field of agribusiness. The development of young actors in the agribusiness sector is more visible in the upland agro-ecosystem zone based on horticultural commodities. Horticultural commodities are seen as having quite promising business opportunities. Limpo [9] revealed that in the midst of the current pandemic, the demand in the horticultural sector, especially for fruit and vegetable products, is actually increasing. Thus, the domestic market will continue to operate despite changes in the global economy. This condition is clearly a business opportunity in itself. This certainly brings new hope for the sustainability of agricultural businesses. Many young people return to the village to do business in agriculture and even penetrate the agro-creative sector (agrotourism, ecotourism, village tourism, creative agro-industry). They work on a micro and medium scale [10].

With the policy from the Ministry of Agriculture to regenerate young farmers with a target of 2.5 million millennial farmers by 2024, this is an opportunity and challenge for young farmers, especially in East Nusa Tenggara. There are several Millennial Farmer Ambassadors in NTT, the name for the farmer regeneration program by the Ministry of Agriculture, who continues to strive in the horticulture field. The challenges for horticultural agribusiness actors in NTT are dry land, water availability, agricultural machinery, to marketing. Meanwhile, the big opportunity came because the Governor of NTT, who declared NTT as a tourist destination, made the agro-creative sector able to develop in the future. Therefore, positive behavior is needed by young farmers in NTT for the future of agriculture, both in Indonesia and in NTT itself.

Carter [11] and McElwee and Bosworth [12], stated that today's agriculture would be better if done by the younger generation, because younger and better trained farmers in a wider variety of business activities tend to have a positive attitude towards market opportunities. New, more sensitive to customer needs, and more prepared to engage in new ventures.

The sustainability of agribusiness in the future is strongly influenced by the behavior of farmers in running their business. An overview of the behavior of young farmers in carrying out their agribusiness is needed as an effort to improve and improve agribusiness behavior as a whole from the production.

2 Research Methods

The research was carried out in 10 districts in East Nusa Tenggara where there is a distribution of Millennial Farmers engaged in horticulture [13]. This study focuses on millennial farmers located in Kupang Regency, North Central Timor, Malacca, Belu, Southwest Sumba, East Sumba, Sikka, East Manggarai, Lembata, and Kupang City with small-scale land ownership. This study uses quantitative research methods to better understand the social facts that are the focus of research [14].

2.1 Types of Data and Data Collection Techniques

The data used in this study are primary data and secondary data. Primary data is data obtained directly from DPM who have businesses in the field of horticultural commodity agriculture in 10 districts in NTT. While secondary data from the Ministry of Agriculture, the Central Statistics Agency, journals, books and other data sources.

Data collection techniques are carried out through:

- Interviews (interviews) with a questionnaire guide, namely direct verbal communication by exploring problems
- Direct observation (observation), namely direct observation is carried out to see the location of the object of research and to collect secondary data. This observation is also carried out in depth, by fully participating in the activities of farmers in business activities
- Literature study from reputable journals as a reference for analyzing data generated in the field.

In this study the variables to be studied are:

- Characteristics of young farmers include: age, education level, farming experience, area and land tenure status.
- The behavior of young farmers is an action or activity carried out by farmers in running horticultural agribusiness, measured through question items with 5 points Likert Scale.

2.2 Sample Selection

Determination of the sample is done by systematic random sampling method. To get high validity, the determination of the sample is very important in this study. The strata in this study are young farmers under the age of 39 years (millennials), farming in the sub-sector of horticultural products in 10 districts in East Nusa Tenggara. The selection of these ten districts is because they are horticulture centers in East Nusa Tenggara as well as the location of the 2021 DPM Ministry of Agriculture. The next step is to take the number of farmers proportionally from each district, so that the total sample studied in this study is 50 young farmers.

2.3 Data Analysis Design

The data analysis was carried out using descriptive statistics. The data obtained were then collected in the form of a frequency distribution table, presented, analyzed and interpreted to see the behavior of young farmers in horticultural agribusiness in 10 districts in East Nusa Tenggara.

3 Results and Discussion

3.1 Characteristics of Young Farmers

Various definitions mention the age limit for young farmers, but the majority state that young farmers or millennials are farmers with an age group under 39 years [4]. As many as 62% of young farmers in NTT are aged 21–30 years, with the average age of farmers being 28.67 years. This shows that horticultural farming in NTT is mostly done by young farmers (Table 1).

An interesting phenomenon is that there is a tendency for the horticultural sector to be attracted by young farmers with a high educational background of secondary education and above, although the percentage is smaller than farmers who only take formal education up to the elementary and junior high school levels. A better level of farmer education certainly brings hope that farmers will have the ability to manage their farms better and be able to innovate in the businesses they run, and have clear business concepts and models [15].

Some farmers (76%) work on their own land. Based on the respondent's narrative, some farmers inherit land from their parents even though the area is limited. For young farmers who are just starting their business, access to land is a challenge to start farming [16].

Young farmers overcome their limitations on land ownership by renting land and also implementing a profit sharing system with land owners. Most of the farmers (50%) control 0.5 Ha–1 Ha of land.

3.2 Agribusiness Behavior of Young Farmers in East Nusa Tenggara

Agribusiness behavior of young farmers is measured by the behavior of farmers in each agribusiness sub-system, namely the sub-system of providing production facilities, cultivation, handling of harvest and post-harvest, marketing and supporting service sub-systems.

In the sub-system of procurement of production facilities, most of the farmers (80%) obtain production inputs such as fertilizers and pesticides by buying them at farm shops. Meanwhile, some farmers who do farming with a profit-sharing system, they get production facilities from the land owner, in accordance with the agreed profit-sharing agreement.

For labor, most of the farmers (70%) use labor from within the family. The availability of capital is a challenge for young farmers who are just starting their business. Most of the farmers said that they still have difficulty accessing capital from banking institutions because they do not have collateral as one of the requirements in applying for credit.

Table 1. Characteristics of young farmers in west Bandung regency

Characteristics	Numbers (n)	Percentage (%)
Age (Years old)		
21–30	31	62
31–40	19	38
Age Average	28,67 years old	
Formal Education		
Eliminary School	7	14
Junior high school	12	24
Senior high school	18	36
Academy	3	6
Bachelor	10	20
Land Tenure Status		
Own by themselves	38	76
Rent	12	24
Land Tenure Large (Hectares)		
< 0,5	13	26
0,5–1	25	50
>1	12	24

The same thing was also stated by Kachova & Ahearn [16] in the case of young and novice farmers in the United States, that limited access to credit is one of the obstacles for young farmers; Farmers need the capital needed to expand the scale of the business they run. Most of the farmers (80%) obtain capital from themselves or in partnership with business partners. For farmers who have partners, they usually get capital from business partners (Table 2).

Some farmers cultivate horticultural commodities with high economic value, and also follow certain cropping patterns according to market demand. Therefore, cultivation technology is needed so that the plants they cultivate provide maximum yields. The technology that is widely used by farmers is cultivation with hydroponic systems, screen houses, and simple drip irrigation. Meanwhile, some other farmers (66%) do not use certain technologies in cultivation, based on the results of interviews, farmers claim that they do not have sufficient capital to apply cultivation technology.

Most of the farmers (76%) have implemented an organic farming system by utilizing the use of organic fertilizers. However, in terms of controlling plant-disturbing organisms

Table 2. The Behavior of Young Farmers in the Sub-System of Procurement of Agricultural Production Facilities

Agricultural Production Facility	Numbers (n)	Percentage (%)
Source		
Buy by themselves	40	80
Given by land owner	10	20
Workers		
Inside family	35	70
Outside family	15	30
Capital		
By themselves	30	60
Financial Instituion Loans	5	10
Relatives Loans	5	10
Partner	10	20

and the use of fertilizers, farmers still use chemical inputs (Table 3). This is driven by market demand for environmentally friendly products and for some farmers, awareness of the importance of maintaining ecosystem sustainability is a factor that influences farmers to implement organic farming systems. Ameriana [17] states that farmers' knowledge of the dangers of chemical inputs influences farmers' decisions to use chemical pesticides.

In post-harvest activities, most of the farmers did sorting (70%) and grading (50%) (Table 4). Farmers say that consumers (final consumers or partners) want products of a certain grade, so they carry out sorting and grading activities. Only a small number of farmers carry out packaging (34%) and labeling (22%). This is because most farmers sell their crops directly to the market. Farmers who carry out packaging and labeling activities are usually farmers who sell their harvests directly to final consumers and also to intermediary traders or partners who really want packaged products.

As previously discussed, most of the farmers (46%) sell their crops directly to the market. Young farmers introduce and sell their products in innovative ways, namely using social media, where for consumers, especially urban consumers, the use of social media is an inseparable part of everyday life [15].

Young farmers are relatively quick and easy to find market information, especially supported by advances in information technology that makes it easier for young farmers to obtain information. Most farmers (82%) know market information related to price developments and also commodity demand. This is in line with the study of Mukti et al. [15] which states that young farmers are more able to follow market needs quickly so that they are more responsive to consumer desires. Sukayat & Supyandi [18] mention that young farmers have a high economic orientation, so that young farmers are more

Table 3. Behavior of young farmers in horticultural crop cultivation subsystem

Cultivation Process	Numbers (n)	Percentage (%)
Using technology		
Yes	17	34
No	33	66
Pest control		
Using chemical pesticide	41	82
Non pesticide	9	18
Fertilizer		
Chemical fertilizer	12	24
Organic fertilizer	38	76

Table 4. Behavior of Young Farmers in Post-Harvest Subsystem

Post harvest activity	Numbers (n)	Percentage (%)
Sorting		
Yes	35	70
No	15	30
Grading		
Yes	25	50
No	25	50
Branding		
Yes	17	34
No	33	66
Labelling		
Yes	11	22
No	39	78

aggressive in seeking information and opportunities and making innovative efforts to maximize their income and develop their business (Tables 5 and 6).

Table 5. Behavior of young farmers in marketing subsystem

Marketing Process	Numbers (n)	Percentage (%)
Marketing		
Directly to the market	23	46
Through the collectot	7	14
Through farming community	10	20
Through partners	10	20
Marketing information		
Yes	41	82
No	9	12

Table 6. Behavior of young farmers in the subsystem of supporting institutions

Supporting Foundations	Numbers (n)	Percentage (%)
Join with farmer community		
Yes	40	80
No	10	20
Having Partners		
Yes	35	70
No	15	30
Accessing financial institutions		
Yes	10	20
No	40	80
Having agricultural extension training		
Yes	45	90
No	5	10

4 Conclusions and Suggestions

The behavior that stands out from young farmers in running horticultural agribusiness is the ability of farmers to seek information and be responsive to change by taking innovative steps so that the commodities produced can meet consumer demand. It can be said that this behavior is the character of an entrepreneur. Farmers who act as entrepreneurs are not only experts in the production process, but they have business managerial skills

that are visionary and result-oriented. The role of technology and information for young farmers in advancing agricultural businesses is also important starting from the cultivation process to selling through social media. In addition, networking with fellow farmers from all regencies/cities in the province of East Nusa Tenggara and even from other provinces needs to be done as an effort to exchange knowledge or agricultural business and add business partners in carrying out agricultural businesses, especially horticulture.

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