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EXTRINSIC MOTIVATION IN FARMING ON EARTHY STONE LAND IN THE BINONGKO ISLAND WAKATOBI REGENCY SOUTH EAST SULAWESI

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ABSTRACT

Coastal areas and small island communities in the Wakatobi archipelago carry out traditional agriculture. Farming is held with a rainfed system on dry land and a dry climate. This system theoretically has non-optimal productivity. Even so, farmers still farm because extrinsic motivation influences how they manage farming land. The productivity of their farms is relatively able to meet the needs of farmers. This study aims to determine extrinsically motivations attached to the traditional agricultural systems of the Binongko community in the Wakatobi Islands. The research lasted eight months, from June 2019 to February 2020. The research data was collected with the triangulation method by observation, interviews, and literature study. The research informants were determined purposively with a chain information collection system. The data were analysed qualitatively using a phenomenological approach. Based on the results of this study, it is known that the Binongko Island community has an extrinsic motivation attached to traditional farming systems, namely, to obtain agricultural products economically, socially, and ecologically. In addition, farmers are also extrinsically motivated by the support from the government. These local wisdom techniques are implemented starting from land preparation and clearing, planting, maintenance, harvesting and post-harvesting.

Keywords: earthy stone; extrinsic; farming; motivation

INTRODUCTION

Agricultural activities on small islands are limited by land availability (van der Velde, Green, Vanclooster, & Clothier, 2007). According to the Law of the Republic of Indonesia, Number 1/2014, these small islands have an area of less than 2,000 km^2. Limited land is exacerbated by the lack of availability of water resources (Hidrawati, U.Rianse, R.M.Iswandi, & N.Arafarh, 2016), so agriculture can only be implemented with a rainfed system. Coastal areas and small islands such as Binongko Island have sub-optimal agricultural land (Kandari, Rianse, Iswandi, & Arafah, 2017), categorised as dry land with a dry climate. Binongko Island has a land area of 156 km^2 with land grouped in the geological formation Qpl (The land characteristic with limestone as the main material of stone and old coral. It is dominated by latosol or podzolic soil. This condition generally indicates low soil fertility due to low pH and organic matter so it is not suitable for farming). Transportation routes between islands are usually only by sea. In certain weather conditions, high waves can make it challenging to access this area. This situation forces people to continue to do food crop farming. Agricultural activities are believed to be the only source of food storage amid difficulties in accessing food resources from the surrounding area.

Farming is one of the livelihoods of the Wakatobi community. Being a farmer and a fisherman are two livelihoods that are generally by a family head. This activity is carried out with a specific time division. They will go to the farm site in the morning and look for seafood in the afternoon or at night. Weather conditions, such as rain or heat, tides, and sea wave conditions, determine this time division.

Agriculture is traditionally and is subsistence in nature. The agricultural land is dominated by rocks, so optimising farming productivity is difficult to achieve. Plants are cultivated on the sidelines of rocks with limited soil from rock decay and plant litter deliberately buried or decomposed by farmers. Farmers use various plant cultivation techniques to manipulate land conditions to remain productive. It is assumed that a number of these agricultural cultivation techniques are based on motivation within the farmer. This motivation makes them survive through farming activities to support their food availability independently and sustainably.

Food is a basic human need, so everyone always tries to fulfil it. Needs that have been met are motivation, and efforts to meet needs are also motivation (Kadji, 2012). Motivation is the reason underlying an action performed by an individual (dan Judge & Timothy, 2008) and, most importantly, the reason for fulfilling needs. Motivation theory was born and developed along with the level of human needs fulfilment. Motivation is divided into intrinsic motivation, which comes from within the individual, and extrinsic motivation, which comes from outside the individual (Sansone & Harackiewicz, 2000). This study seeks to reveal extrinsic motivation from outside the individual farmer. This motivation drives them to take various technical actions in managing their farming.

Research related to this study includes discussing the motivation of farmers in adopting agricultural technology (Herath, 2010; Ingram, Gaskell, Mills, & Short, 2013). The form of motivation can be in the form of income and life satisfaction (del Mar Salinas-Jiménez, Artés, & Salinas-Jiménez, 2010) which is part of a person's ultimate goal in carrying out a job. Motivation is also associated with managing agricultural and environmental resources (Bopp, Engler, Poortvliet, & Jara-Rojas, 2018; Jambo, Groot, Descheemaeker, Bekunda, & Tittonell, 2019). The use of labour and other production factors (Lalani, Dorward, Holloway, & Wauters, 2016). This study focuses on the extrinsic motivation that underlies farmers in determining the appropriate farming techniques on their farms. The research aims to discover and explain the extrinsic motivations that underlie traditional community farming techniques. The research results are expected to benefit farmers, society and government in developing agriculture in coastal areas and small islands.

MATERIAL AND METHODS

This research is a qualitative type with a case study design. This research is a type of qualitative research with a case study design. The research variables consist of extrinsic motivation and farming techniques. Extrinsic motivation is the dependent variable that affects farming techniques as an independent variable.

The research was conducted from June 2019 to February 2020 with a case study location on Binongko Island, Wakatobi Regency, Southeast Sulawesi Province, Indonesia. The determination of Binongko Islands as the case study location is based on the consideration that there was no study related to this research in the area. Binongko Island is unique among other islands in Wakatobi. This island is identified as an area that is difficult to access due to high sea waves (Hamid, 2016), and farming activities are carried out on soiled stone land (Rudi, 2016). On a representative basis, Binongko Island can represent the geographical conditions and traditional farming techniques of coastal communities and small islands in Wakatobi Regency.

The research data were collected using the triangulation method through observation, interviews and literature study. The informants in this study were determined purposively and carried out using chain information gathering techniques or rolling like a snowball. Determination of informants begins with determining key informants and then leads to selecting several primary informants and supporting informants. One key informant meets the criteria, namely having extensive knowledge of various sectors in society and being able to direct researchers to find other informants who are experts in the subject matter that the researcher wants to know. Twenty-six primary informants meet the criteria as people who know and are experts in the local community's culture: the primary informants comprised village officials, traditional leaders, youth leaders, and farmers. Furthermore, to add or clarify the data and information obtained, the supporting informants are determined, amounting to 38 people.

The research data were analysed qualitatively by describing the research report containing quotations from observations, interviews, and literature studies. Data were analysed by making meanings or interpretations and classifying and presenting descriptively using the phenomenological method. Phenomena are explained based on emotional and ethical views, resulting in generalisations of discussion by the research objectives.

RESULT AND DISCUSSION

Characteristics of Informants

Informants in this research amounted to 65 respondents, consisting of 1 key informant, 26 primary informants and 38 supporting informants. The identity of the informants by gender, age, the primary type of work, and level of education can be seen in Table 1 as follows:

Table 1. Characteristics of research informants according to gender, age, main type of work, and level of education

No	Category	Total of information (People)	Percentage (%)
Gender			
1	Male	51	78
2	Female	14	22
Age (year)			
1	15-45	16	25
2	45-75	41	63
3	>75	8	12
The primary type of work			
1	Farmer	41	63
2	Government employees	11	17
3	Others	13	20
Level of education			
1	Elementary School	40	62
2	Junior High School	13	20
3	Senior High School	7	11
4	College	5	8

Table 1 shows that most of the informants, approximately 78%, are male, and only 22% or 14 persons are female. This is because the research informants are generally heads of families, and 63% are farmers as their main livelihood. The 11 people make a living as civil servants, or 17% and as many as 13 people or 20%. Other livelihoods include work as traditional officials, mosque managers and leaders of community organisations. In addition, Table 1 also shows that as many as 41 informants or around 63%, are aged between 45-75 years, indicating they are in the productive age category. The elementary school level dominates informant education, but there are those who study up to senior high school and college levels.

Extrinsic Motivation Underlying Traditional Agricultural Techniques

Extrinsically, the main motive of the Binongko people is to obtain social rights. In the form of recognition and appreciation as members of society with high social status. People who get the results of commerce and shipping, supported by their activities in agriculture and fisheries, will appear socially as wealthy individuals. Many later made the pilgrimage to Mecca or paid for their families to continue their education to a higher level. Hajj and those who are educated are considered social beings while having high societal positions. They will usually get different social recognition and treatment because it marks a person's social and economic well-being, giving them rights or dignity in society.

Apart from obtaining social rights, the extrinsic motive underlying the community's traditional agricultural techniques is agricultural production with economic, socio-cultural and ecological values. Monetary value can be seen from the weight of the product, both in money and non-money. Initially, a farmer only cultivated the land to meet his and his family's needs. Over time, their human instincts encourage them to share with neighbours or people around them. Sharing with neighbours gives a farmer social benefits such as gratitude and better family relationships. Farmers can also get money (financial benefits) from their farming because they sell them to people in the village or the market. These social and economic benefits are the motives that move the mind and bodies of a farmer to develop their farming techniques.

Theoretically, agricultural business results have been a positive consequence that tends to be repeated. Reinforcement motivation theory views that human behaviour is determined by the consequences provided by its environment. This theory is based on Thorndike's law of effect(dan Judge & Timothy, 2008), which is that behaviour that produces pleasant outcomes will tend to be

repeated, while behaviour that has unpleasant results will tend not to be repeated. Actions to provide food needs in positive farming activities are always maintained and even enhanced by the community.

Furthermore, government policies encouraging local food production also serve as extrinsic motivation for the Binongko community. This is marked by the enactment of Government Regulation 68 of 2002 concerning Food Security. This regulation regulates a food diversification system that supports the community in producing local food. This regulation has presented several government programs and activities, namely providing facilities and education to farmers. Moreover, in various media, the government has urged the public to be active in consuming local food because it has economic, social, and health benefits. This motivates farmers to be more involved in developing their farming land, especially root crops.

Several informants have mentioned the motivation to intensify farming land due to government support. They admit that the local government, through the Wakatobi Regency Agriculture Office, has provided production facilities in the form of seeds, fertilisers and medicines to kill pests and plant diseases. Some production assistance that has impressed farmers are the provision of 7-month-old cassava cuttings, vegetable seeds (spinach, kale, bitter melon, cucumber, chillies and tomatoes) and equipment such as hoes and grated sweet potato machines. They also admit that they have participated in the government's training activities in farming land management. The informants also stated that the provision of production facilities and training assistance did not take place patently and sustainably. However, most informants admitted that this assistance greatly stimulated them to manage their farming land. Some of them have been able to anticipate the availability of production facilities by buying them from other places. This situation indicates that government intervention has stimulated farmers to be enthusiastic about managing their farming land.

Socially and culturally, the results of agricultural business can be assessed from the formation of social cohesiveness among community members in a series of farming activities. There is local wisdom in *posa'asa* or *pohamba-hamba,* starting from land clearing, planting, maintenance, harvesting and post-harvesting. Each series of activities held under the *posale* or *pohamba-hamba* system has created a space for people to interact and help each other. Farm products such as fruits and vegetables are usually shared with neighbours and other needy parties, so their kinship is well established. Besides that, farming activities are also carried out in a series of traditions or cultures, for example, the implementation of a ceremony at the Kapitan Waloindi grave before planting or a joint prayer event in the local institution meeting room (*Baruga*) after harvesting. These cultural rituals are still maintained today and have become community identities.

Ecologically, farming products can be assessed through the effect of cultivation measures on environmental conservation or maintenance processes. Farmers on Binongko Island apply a farming land management system that is environmentally friendly. The management system includes *honowu/katambhari* activities, namely collecting soil, plant litter or garbage around plant roots (Hidrawati, M.A Limi, N. Arafah, S.A. Fyka, & Harviyadin, 2019; Hidrawati et al., 2016). This aims to increase soil nutrients and protect the surrounding plant roots from drought and weeds. *Honowu/katambhari* is a form of fertilisation or traditional mulching which is classified into the practice of LEISA (Low External Input Sustainable Agriculture) or Sustainable Agriculture with Low External Input (Reijntjes, Haverkort, & Waters-Bayer, 1999). Mulching is an essential technique for improving soil microclimate, soil life, structure and fertility; keeping the soil moist; reducing weed growth; preventing damage from the effects of solar radiation and rainfall (erosion control) and reducing the need for soil management. *Honowu/katambhari* as an activity to add soil nutrients, has ecological advantages. Soil nutrients can be formed from the weathering of plant litter and organic waste from *honowu/katambhari* activities. Organic material derived from plant litter will undergo a slow weathering process but experience complexity over time (Kleber & Johnson, 2010). This means that weathering of organic matter can be a source of nutrients that will increase the plant's availability. For this reason, soil productivity tends to stagnate and even increase, thus supporting ecological sustainability. The act of cultivating plants through *honowu/katambhari* activities can provide benefits in the form of creating environmental sustainability so that it contributes as an ecological advantage that can motivate people to continue farming activities.

Traditional Farming Techniques for the Coastal Areas and Small Islands Community

Traditional farming techniques are used in this study to manage agricultural land based on several motivations. The farming technique is a manifestation of a strong desire to continue farming activities. This is related to manipulative actions to design land conditions so that it can produce optimally and sustainably. The community's traditional farming techniques are described below, starting from land preparation and clearing, planting, maintenance, harvesting and post-harvesting.

Preparation and Land Clearing

The land preparation stage is characterised by selecting land according to ownership, fertility conditions, and distance from the farmer's settlement. The aspect of land ownership is related to the division of farmland into a family clump. A newly married couple will usually be shown by their parents at least one area they can manage as farming land. Each household head generally owns more than one farming land with relatively different land clearing times. Some land can be cleared in the east season, while others can be opened in the west season. This is so that when one piece of land has been harvested, another is still ready to be harvested. Some farmers cultivate their land using the period rest for land (*bera*) system with an average of 1 to 4 years. Some cultivate the land without *bera,* but the plants are replaced according to the season and time of harvest. For example, in the western season, corn and vegetables are planted, and after the corn and vegetables are harvested, cassava and other tubers are cultivated. Then, when the next west season, the land is planted back with corn and vegetables and so on.

Having more than one farm is a form of supply and an effort to guard against food shortages, especially if there is an attack by pests and diseases on one farm. Besides that, land ownership in more than one place is also a strategy for farmers to deal with limited agricultural land resources. Binongko farmers have an average land area of 0.13 ha. Narrow control over land has triggered farmers to increase the amount of land.

After the ownership aspect, the Degree of land fertility is also an essential factor in choosing a farm with the primary indicators used, namely growing vegetation and land topography. Fertile soils are characterised by *balande,* and *kambaragi* (*Lantana camara L*.) vegetation and less productive soil is characterised by reeds (*Imperata cylindrical L*.) and rivers (*Eupatorium odoratum L*.). The topography of the land that farmers usually choose is the valley (*kollo/bolonga*), a land area between two hills. On the other hand, the farm's location from the farmer's settlement is also a consideration in choosing the land. Those still young will usually select land that is further away but is considered more fertile and broader. Meanwhile, older adults generally choose to manage land close to their settlement because of labour and safety considerations.

The land that has been selected will then begin processing. Land processing starts with a land-clearing ritual (*bhelaia*). *Bhelaia* is performed on a good day at the end of the eastern season or entering the western season after seeing several signs shown by nature and animal behaviour. These natural signs are like the appearance of the constellation *pari* sky (*sangia/pariama*); appearing lightning (*mbena-mbena*) in the sky; the frequency of the *kureu* chirping; whales (*bungkulawa*) surfaced on the edge of the deep sea and spouted water. The *bhelaia* ritual begins by entering the middle of the land that has been chosen and then sitting in the scrub or grass facing north. When sitting then grabbed the grass and chanted a mantra. After casting the spell, they began to *pameri*, namely cutting down trees and clearing grass. Trees whose trunk is approximately the size of a fist are cut/felled (*tambae*) only up to the chest, because they will die by themselves when the roots rot. When it is cut down to the bottom (near the base of the root), it will quickly sprout again. The tree cut down half a chest (*pusino kau*) can later function as climbing poles (*seka/kancinae*) for vines, especially beans.

Planting

The timing of planting is based on time calculations (*kutika*), natural phenomena such as the position of the moon and stars and the sea's tides. When the rain began to fall in the western season, and after the farmers had cleared the land, the local institutions' leaders of the *Cia-Cia* community agreed to determine the best time to start planting activities and the implementation of the *phitado* ceremony. The time indicator for the *pitadho* ceremony is adjusted to the time to plant corn when it is known that the frequency of rain is getting high and it is estimated that rainwater has started to wet the soil thoroughly. For the *Wali* community, the *phitado* ceremony is held with a prayer at *Baruga Sarano Wali*. In contrast, for the *Waloindi Haka* community, the ceremony takes place with a prayer together at the tomb of *Kapitan Waloindi*.

After the *pitadho* ceremony, the farmers started planting corn, although perhaps previously, some farmers had planted other crops such as various types of *Dioscorea* sp (*opa/tombili/santa/kano/manga*). After the rain falls, farmers will plant vines such as pumpkin, cucumber, bitter melon, corn, and beans. After all the vines, beans, and corn have grown with a minimum of three leaves, cassava is planted. According to the experience of farmers, corn will thrive when it is planted with beans around it. Agronomic theory suggests that legume plants can produce symbiosis with rhizobium bacteria to fix N from the air to meet the nutrient needs of surrounding plants (Raza et al., 2020), especially in intercropping or mixed farming systems.

The mantra chanting also marks the planting ritual for asking those in power to fertilise the cultivated plants and avoid pests and diseases. The results are sufficient to meet the needs of humans, animals and plants. The activity of planting cassava and various types of *Dioscorea sp* is also accompanied by the technique of using a crowbar and the position of the hands, which are believed to affect the harvest yield. When planting cassava, the crowbar is held by the right-hand parallel to the cassava pile to be produced. The thumb and thumb of the left hand hold the cassava stem, while the other three fingers, namely the middle finger, ring finger and little finger, are straightened and widened to resemble the braid cassava fingers that are expected to form. Binongko farmers believe that when the crowbar is parallel to the cassava stalk and the fingers are straightened and widened, a cassava tuber will create, which collects at one point near the stem with a minimum number of tubers according to the number of fingers.

Maintenance

Plant maintenance activities include embroidery; fertilisation; fighting weeds, pests and plant diseases. Stitching is carried out approximately seven days after planting. In principle, embroidery is done on plants that do not grow. In cassava plants, embroidery is carried out if stems do not grow and will be replaced with stem cuttings that are longer than seed cuttings when planted. This is so that the plant height is the same when the cassava plant grows.

Meanwhile, embroidery of corn and various fruit and vegetable crops is carried out by replacing non-growing plants using available seeds. If the plant's seed is no longer available, the farmer will replace it with another plant, so the land is not empty. Farmers pay great attention to optimal land use due to the limited availability of land.

The fertilisation of plants is carried out according to the stages of plant growth. The crops that are usually fertilised are corn, vegetables and fruits. Farmers from the government obtain chemical fertilisers or artificial fertilisers such as urea and NPK, and some buy from outside areas. For this reason, this type of fertiliser is only used by farmers when the government distributes it or when they have the financial capacity to procure it. If fertiliser is unavailable from the government, farmers use manure from goat or chicken manure mixed with kitchen ash or ash from burning during land clearing. The most commonly used livestock manure is goat manure. The ratio of livestock manure and ash is 1:1. For example, one livestock manure and one ash litter. In fact, some cases have mixed urea and goat manure and kitchen ash with 1 part urea and goat manure and 1 part kitchen ash. The mixed fertilisers are given after the corn, fruit and vegetable crops are approximately 45 days after planting.

Maintenance activities that farmers usually carry out are *honowu/katambhari*. At the time of planting, farmers will do *honowu/katambhari* after the seeds or seeds are planted and then continue as long as the seeds or seedlings grow until they are ready to be harvested. If farmers harvest, unused plant parts such as leaves and fruit skin will be used again as mulch for other crops. And so on until it resembles a cycle. The frequency of farmers doing *honowu/katambhari* actions is also supported by their belief that the more diligently they do, the more fertile their crops will be and produce bountiful harvests.

Along with implementing *honowu/katambhari* activities, farmers perform *pajere'e* and *bhija-bhija* rituals during plant maintenance. *Pajere'e* is done by going around the garden, and the farmer places his palms behind (near the waist) while shaking and saying they pray. When doing *pajere'e*, the farmer will stop at one type of crop and then clean or fix the position of the plant canopy while casting a mantra. Plant disease pests can also be overcome by carrying out the *pidhawu* ritual. *phidawu* ritual can be done individually at the farm location or collectively by local institutions. The traditional institution will hold a pidhongka ceremony if the pest attack is severe. The *pidhongka* ceremony is led by the chairman of the conventional institution (*sara*), with the event's highlight washing the small boats containing offerings into the sea. The washing away of these objects is interpreted as eliminating various pests and plant diseases.

Theoretically explained, the procedure for preventing plant pests through rituals can be annulled as a mechanism for *egocentrism* (Reijntjes et al., 1999; Sjamsir, 2017). Contextually, *egocentrism* is carried out by farmers by avoiding the use of chemicals that are known to damage the life cycle of soil, water and air organisms. Limited eradication of pests and plant diseases is only carried out through a ritual which is essentially a communicative form between farmers and nature and with animals and plants in their farming locations. *Pajere'a, bhija-bhija* and *pidhawu* rituals are only the intended communication media and are believed by farmers to have positive implications for their farming results.

Harvest and Post-Harvest

The harvest age of a plant is determined by its type and designation. Vegetables and corn crops can be harvested between 2 and 4 months. Cassava is gathered in about seven months to 3 years, depending on the variety and its designation (Umliyah, Bahari, & Limi, 2019). The cassava plants are harvested according to the farmers' needs, and there is always a cassava stock on the farm with different harvest ages. If the farmer only owns one piece of land, efforts will be made to ensure that the cassava production on that land can continuously meet the farmers' needs. It is as if the cassava farming land stretches from west to east. When the last harvest is in the east, then cassava in the west is ready to be harvested at the next harvest time. For farmers with several farming locations, if one cassava land has been harvested, there is still another that is ready to be harvested. Thus, the farmer's cassava stock is always available throughout the year. This system applies not only to cassava plants but also to other food crops, such as various types of bananas, papayas, etc.

The harvest activity (*tompe'a*) is marked by the implementation of the *phidawu* ritual on the four edges (*jiku*) of the farming land while chanting mantras and placing offerings from the harvest. The mantras chanted in principle consist of surrendering a share of the harvest to all the spirits of nature, including animals and plants. It is the essence of the agro-centric understanding, which assumes that the yield obtained by farmers is the result of the harmonious work of the component systems of life in nature, so each component deserves a share of the results. In addition, post-harvest activities are also marked by prayer events in *Baruga* and the distribution of the harvest by the farmers.

CONCLUSION

Based on the results of this study, it can be concluded that the extrinsic motivations underlying the community's traditional farming techniques are obtaining social rights; obtaining agricultural products economically, socially and ecologically; and support from the government. This motivation has encouraged farmers to apply local wisdom techniques to mixed farming systems on more than one farm. These local wisdom techniques are implemented starting from land preparation and clearing, planting, maintenance, harvesting and post-harvesting.

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