

# Farmer Decision on Cocoa Farm in North Lombok, Indonesia

Taslim Sjah<sup>1,2,\*</sup>, Ridwan<sup>1</sup>, Ibrahim<sup>1</sup>, Sri Supartiningsih<sup>1</sup>, Padusung<sup>1</sup>

<sup>1</sup> Faculty of Agriculture, University of Mataram, Mataram, Indonesia, 83125

<sup>2</sup> Study Program of Dryland Agriculture, Postgraduate Study, University of Mataram, Mataram, Indonesia, 83125

\*Corresponding author. Email: [taslim.sjah@unram.ac.id](mailto:taslim.sjah@unram.ac.id)

## ABSTRACT

Agricultural land in North Lombok, Indonesia, provides farmers with several choices of crops to be grown, among others is cocoa. However, farmer reasons for growing this crop is not completely documented. This paper explores farmer reasons for growing the crop and models their decisions. This paper used secondary data and field observation to serve the study objectives. The unit of analysis is cocoa grower in North Lombok. Data were analyzed in a descriptive way, providing farmer reasons or motives for growing the crop and building models to bridge farmer decisions in growing the chosen crop. This study found that there are three reasons that guide farmers into growing cocoa, i.e. income, social relation, and available time. These three reasons are then utilized to build the farmer decision model for the crop choice. The model indicates that cocoa growers are rational. This result also implies for extension activities, to be implemented in an effective way.

**Keywords:** *Cocoa farm, Decision model, Farmer decision*

## 1. INTRODUCTION

Agricultural sector has been one of the important sectors for many years in supporting Indonesian economic development. The development has been to increase agricultural production and recently become more specific rather than just increasing production alone, for example the program of food sovereignty, by fulfilling demand of foods through domestic production, self-regulating food policy, protecting and prospering farmers as the main actor of agricultural activities [1-3].

The government of Indonesia has the strategy for putting agriculture as the mover in Indonesian development. In practice, the position is meant to: (1) achieve self-reliance in rice, corn, soybean, chili, onion, increase the productions of sugar and meat; (2) diversify foods; (3) increase added value and competitiveness of export commodities and import substitution; (4) proving raw materials for bio industry and bio energy; (5) increase income of farm families; and (6) accounting to quality government official performance. [3]. Therefore, the sector of agriculture is not only important for itself but also for other sectors and for the country of Indonesia.

Important efforts for achieving the strategy, include the following: (1) improving land availability and usage; (2) improving agricultural facilities; (3) developing seeds; (4) improving farmer institutions; (5) improving financing; (6) developing bio industry and bio energy; and (7) expanding market for agricultural products [3]. In essence, these efforts are the same as implementing agribusiness, i.e. implementing agriculture from upstream to downstream, including the sub system of supporting agribusiness [4-6]. With the agribusiness approach, it is expected that the impact of the development becomes higher than the separated implementation of each sub system of agribusiness [6, 7].

The North Lombok government develops its agriculture based on its land resources and climate [8]. This is in line with the first mentioned effort above. To use the land with higher impact than before or currently, the government of North Lombok has also been implementing other strategies mentioned above for developing its agriculture, improving the livelihood of its people, and advancing its region. Developing agriculture by the government of North Lombok Agriculture is grounded on the nature that different locations or regions grow different plants or crops that their nature is supporting [9-11]. One of the crops that farmers grow in North Lombok Regency (in the province

of West Nusa Tenggara) is cocoa. The production of cocoa in 2020 in North Lombok Regency was 450,358 kg [12]. By nature and people's conditions, cocoa is not the only choice available to farmers in the region [12, 13]. Yet, many farmers in North Lombok choose this crop, for one or more reasons [14].

Understanding stakeholders' motivations or reasons and needs in a development program (programs) is important for a successful implementation of the program(s). Several literatures have indicated and prescribed this. One of the examples was the importance of motivation for businesses to grow in the market and that motivations are linked to the needs of the people and market [15]. Another is shown that successful implementation for many programs is largely dependent particularly upon motivation of the implementing staff and also highlighted the importance of meeting the needs of the programs [16]. The importance of motivation, in particular the intrinsic one, was also highlighted in adoption of new systems and programs [17].

For gaining understanding on the behavior of cocoa farmers and in considering the importance of the understanding, this paper explores farmers' decisions in farming cocoa in North Lombok Regency. The results of the exploration are then utilized to build a model of decisions that cocoa growers made. It is expected that this study will be useful at least in developing extension programs to cocoa producers and in making governmental policy for developing cocoa production and its product derivatives.

## **2. MATERIALS AND METHOD**

This study applies qualitative research [18-20] on decision making by cocoa growers in North Lombok, with positive analysis [21, 22] on describing and explaining the decisions that people made. Unit of analysis in this study was an individual cocoa farmer in North Lombok. Data for this study were obtained from secondary sources, particularly from Sabdi (2016), who studied factors affecting farmer decision in a cocoa farm in North Lombok Regency. The method of data collection by Sabdi (2016) can be described briefly here. Selection of research location in North Lombok was conducted in purposive way on the basis of most cocoa growers in districts and villages. The selection of location result in two locations, i.e. Genggeling Village of Gangga District and Sokong Village of Tanjung District. The number of respondents was quoted for 30 farmers, and distributed proportionally into 22 farmers in Genggeling Village (in Gangga District) and 8 farmers in Santong Village (in Tanjung District). Respondents were selected in systematic random sampling, using the list of cocoa farmers obtained from each selected village. Data from farmers were collected through interviews using semi-structured interview format. Sabdi (2016)

analyzed data for his study in a descriptive way and found factors that affect farmer decision in growing cocoa. The findings by Sabdi (2016) are then capitalized for the purpose of this paper. Firstly, the decision factors are described and explained. Secondly, farmer decisions are modelled based on decision reasons (farmer motives) in selecting cocoa as their grown crop. The result of the analysis is presented in the section of results and discussion.

## **3. RESULTS AND DISCUSSION**

This main section presents decision theories related to farmers in developing countries, such as Indonesia, in the context of rural development. This is followed by a presentation on factors affecting the decision of cocoa farmers in North Lombok and the decision model of the farmers. Finally it discusses the implications of this study for extension services in the region or else.

### ***3.1. Decision Theories in the Context of Rural Development***

There are many decision theories, spanning from complicated to simple one, from economics end to psychology end [23]. Among them, decision theories related to rural development have focused on positive analysis, i.e. describing and explaining about what people do. This subsection explains two decision theories that complement one to another, and therefore facilitate understanding about the decision; one is theory of real-life choice and another is personal construct theory.

#### ***3.1.1. Theory of Real-life Choice***

This research is about understanding decision making by cocoa growers in North Lombok Regency. Farmers in North Lombok, as part of Indonesian farmers, can be put in the context of farmers in developing countries. In relation to decision making, farmers in developing countries can state that they make decisions in a simplified way, in the sense that they make decisions in not so serious a way, but rather in so called half, less, or subconsciously, without paperwork or computer work. The important thing to be described here is to understand the decisions that farmers actually reach, and therefore use positive analyses [21, 22]. Many studies that apply this approach are the works of Gladwin and her colleagues [24-35]. Gladwin's theory of real-life choice is particularly applied here. The theory draws on Tversky's [36] 'elimination by aspects' and Tversky and Sattah's [37] 'preference trees'. The principles of real life choice are considered to be similar with the theory of real-life decisions [38] and choice theories [39], as well as what have been applied in selections of careers and partners in life [40].

Gladwin's (1980, 1983, 1989) theory is well known as 'Theory of real-life choice', and was grounded on the observation that in real-life people make a decision in a simple way, i.e. by comparing alternatives, not ranking them. The simplified way is carried out due to limitations on cognitive capacities of decision makers to process information. The theory has two stages in reaching a decision. The first is to reduce alternatives to only several alternatives which can be managed cognitively. The reduction is done by eliminating alternatives that do not meet certain criteria set out by the decision makers. The elimination is done rapidly, with giving less attention or awareness than ordinary ones, in the way of unconsciously or subconsciously, which Gladwin (1980) and Gladwin and Murtaugh (1980) called a preattentive process. The process in the first stage left a few alternatives in which its number is manageable by decision makers. If this stage gives only one alternative, then the decision process is completed, no more deciding process is required. In a situation where there is no alternative remaining, then decision makers may need to reconsider other criteria or take other actions. When there are still several alternatives that pass the first stage, then the decision process needs to go through to the second stage.

In the second stage decision makers consider more seriously or more consciously alternatives remaining from the first stage, and attempt to maximize subject to constraints. Each of the remaining alternatives is compared carefully to the others, in regard to every constraint or aspect selected. Decision makers choose the alternative that ranks highest on a 'major' aspect of consideration after all aspects have been passed. In the selection of crops, such as cocoa, farmers may select on the aspects of production amount, product price, or skills that farmers possess. Which one is called a major aspect among others is dependent on the farmers (as decision makers) themselves. When there is no best alternative, then the second best alternative comes into consideration, and so on. Under the condition of no best alternative decision makers will search for another alternative by employing other strategies, for example, by making order of alternatives on another aspect, lowering requirements of the same aspect, eliminating constraints, postponing decisions, and searching for other alternatives.

### *3.1.2. Personal Construct Theory*

Theory of personal construct of Kelly [41, 42] is required here for the purpose of complementing the theory of real life choice [28, 29, 31], i.e. to provide reasons or motivations of people in making decisions. The theory of personal construct assumes people as scientists. The people become scientists as they develop hypotheses about how things will work and continually test those hypotheses against their findings in their life. Once those hypothesis correctly proven, then they apply

them in their life, and those people become scientists. Eventually everyone becomes a scientist in their fields. For instance, the scientists in farming are farmers; the scientists in marketing are traders; and so forth. The important question then how do we know people motivations in their behavior or their decisions? In this regard, Kelly (1955, p. 201) suggests that '*If you don't know what is wrong with a client, ask him; he may tell you!*'. In brief, knowing people motivations or reasons in making particular decisions, is through dialogue with those people. Putting in another way, this suggestion says that we do not assume people motivations in their decisions, but ask them.

### **3.2. Factors Affecting Decision on Cocoa Farm in North Lombok**

Cocoa is one of the plantation crops that farmers grow in North Lombok. It was the second highest production of plantation crop in the regency, after coconut, and before coffee [12], showing that the crop is important for the area, and was (and still is) a choice of farmers in North Lombok.

Farmers grow cocoa in North Lombok for many reasons. According to a survey in the region by Sabdi (2016), reasons for growing cocoa included: income generated by the crop, utilizing leisure time, getting privilege in being a member of a farmer group.

Income generated by cocoa in North Lombok was investigated by Sonjaya (2016) and found as much as Rp 4,830,842 per hectare. According to Sonjaya (2016) this income level is the second highest, i.e. below the income level of coconut with Rp 5.632,005 per hectare. Income per hectare of cocoa is higher than candle nut, coffee, clove, banana, and seasonal crops. Therefore, this income reasoning in growing cocoa is valid and genuine. Sabdi (2016) found that the generated income was found as a major reason in growing cocoa. This is an economic reason, which indicates that cocoa farmers are rational. That is, they attempt to maximize utility (here is income) from (lowest) sacrifice they make [43-46]. Income has indeed become the biggest and most common motivation in doing business [47-51], including in this business of cocoa. Therefore, it is understandable that most cocoa farmers have income in their mind in doing this business.

The reason for growing cocoa is to be able to be a member of a group (that is farmer group) can be explained from the privilege farmers gain. From a social aspect, a member of the group can have many new friends from which information on many things, including on technical and market of cocoa, which are very useful for them, in doing the business. Furthermore, many government programs, including funding are given to farmer groups, therefore a member also receives the program and funding. Thus, at the end this social reason

is also economic and becomes evidence of rationality of the farmer's behavior.

The other reason is utilizing leisure time in growing cocoa. This appears to be that growing cocoa is a hobby, meaning that earning income is a secondary purpose. However, farmers do mention this reason has been in condition that they already have sufficient income from other sources. Or, they have already gained income from cocoa, and the leisure time is an additional reason for growing cocoa, so additional benefit is attainable. This reason also shows that cocoa has an advantage over other crops. In other sense, farmers who grow cocoa have considered that they have time to grow the crop; otherwise they would not grow it.

There are many other possible reasons for growing cocoa, yet the farmers only mentioned at the time those reasons. For example, the suitability of cocoa with soil and climate must have been considered as important elements in growing crops, including cocoa. According to Gladwin's theory of real life choice [28, 29, 31], people make simplifications by eliminating alternatives in the condition of sub, half, or not fully conscious, in which motives or considerations appear to be non-existent. In this sense, the cocoa farmers in North

Lombok are assumed to have had simplification in their decision making process. In addition, given only one alternative decision remained as an option then the second stage of decision making process of real life choice is not required.

### 3.3. Modelling Decision of North Lombok Cocoa Growers

From the three reasons for growing cocoa in North Lombok, decisions that farmers made can be modeled. Given the investigation was directed into reasons for growing cocoa, without investigating alternatives other than cocoa, the model presented here is indeed a simplified model. That is, the model is built without fully following the decision steps outlined in Gladwin theory [25, 28, 31, 52]. Rather, the model is a confirmation that is already built in the mind of farmers. The decision model of the cocoa farmers is depicted in Figure 1. The figure shows that farmers put important consideration on three aspects, i.e. profit, social advantages, and leisure time. All of these considerations are in the nature of economics, directly (the i.e. the first reason), or indirectly (i.e. the second and third reasons).

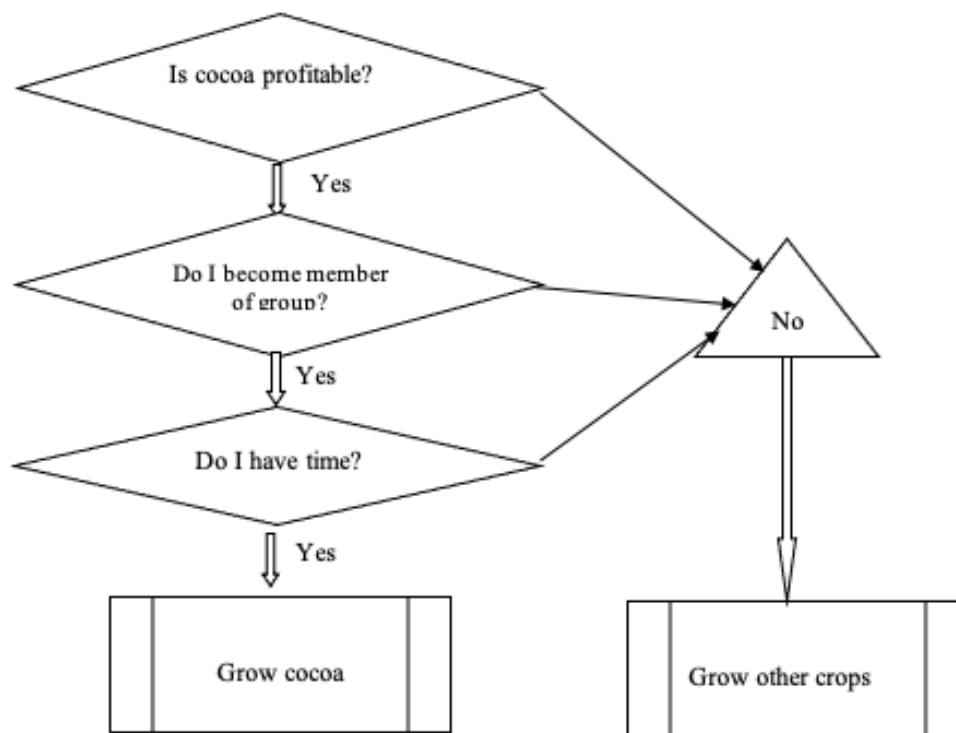


Figure 1 Decision process to grow cocoa in North Lombok

### 3.4. Implications of Findings for Extension Work

The main lesson that can be learnt from Figure 1 of this decision making process is that promoting a crop or crops to be grown in a certain region(s) must be able to convince that the crop is profitable or bring benefits, of economic and non economic, to the people who will do it. Economic motive is one of the most important motives in people behavior [53-55]. However, non-economic motives also affect people's behavior [56-59].

However, convincing people that a crop or crops are profitable, is sometimes insufficient by just showing a calculation on paper. It will need proof in practice, for example by demonstration on the field, as frequently suggested by extension literatures [60-64].

Extension works in growing cocoa, of course, are not merely planting cocoa, but also require good practices from cocoa pre-production through to post harvest and handling [65]. The practices will bring positive and high impact for the life of the cocoa producers and other community groups and the region. However, cocoa growers also experienced several problems in the production of cocoa in North Lombok, one of them was lack of working capital to do the practice or the good one [14, 66]. As a consequence for better cocoa production now than before, then cocoa growers will need external assistance in accessing working capital, such as from government or commercial lending institutions. In this regard, credit disbursement and its follow up activities need to be implemented in a better way than the conventional practice, to assure effectiveness of the financing activities and the credit itself [67].

## 4. CONCLUSION

The conclusion from this study is that there are three reasons for farmers to grow cocoa in North Lombok Regency, included, generated income, social relation, and available time. The reasons show farmers are rational in sacrificing their resources and expecting the highest gain from their sacrifice, for which income is the important reason in their behavior and other two latter reasons were at the end essentially economic for the cocoa producers. These three reasons are then utilized to build a cocoa farmer decision model, showing the aspects of the crop choice and the steps in reaching the decision. This result also implies for extension activities, to be implemented in an effective way, by paying attention to economic motive in particular and other accompanying motives in the behavior of farmers (or other people groups).

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