



THE ANALYSIS OF GUAVA SUPPLY CHAIN; CASE STUDY AT KAMPUNG JAMBU CIMAUNG WEST JAVA INDONESIA

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Abstrak

Kampung Jambu Cimaung merupakan tempat membudidayakan komoditas hortikultura yang menjual hasil buminya baik untuk kebutuhan lokal maupun ekspor. Penelitian ini bertujuan untuk mengetahui aktor, arus, serta faktor pendorong dan penghambat rantai pasok jambu biji di Kampung Jambu. Metode yang digunakan adalah metode deskriptif kualitatif dan teknik pengumpulan data dilakukan dengan menggunakan wawancara dan observasi sederhana. Penelitian ini menggunakan reduksi data dan penyajian data untuk penarikan kesimpulan. Hasil penelitian menunjukkan aktivitas rantai pasok jambu biji di Kampung Jambu Cimaung cukup baik, terdapat lima mata rantai dalam aktivitas rantai pasok Kampung Jambu, pola rantai pasok Kampung Jambu meliputi pola modern, arus informasi, informasi harga jual di pasar internasional dari eksportir tidak tersampaikan ke Kampung Jambu, faktor pendorong utama kegiatan produksi adalah permintaan konsumen yang tinggi dan globalisasi, sedangkan faktor penghambat rantai pasokan terbesar adalah iklim dan kurangnya tenaga kerja. Kampung Jambu diharapkan dapat menciptakan kolaborasi bagi setiap pelaku rantai pasok, khususnya pemasok dan konsumen, serta menerapkan manajemen rantai pasok yang efektif dan efisien.

Kata kunci: *Pelaku Rantai Pasokan; Pola Rantai Pasokan; Faktor Pendukung; Hambatan.*

Abstract

Kampung Jambu Cimaung is a place for cultivating horticultural commodities, who sold their crops both local and export needs. This study aims to determine the actors, flows, as well as driving and inhibiting factors of the guava supply chain in Kampung Jambu. The method used is a qualitative descriptive method and data collection techniques are carried out using interviews and simple observations. The research uses data reduction and data presentation for concluding. The results showed that the supply chain activity of guava in Kampung Jambu Cimaung is quite good, there are five links in the supply chain activities of Kampung Jambu, the supply-chain pattern of Kampung Jambu includes modern patterns, the flow of information, information on selling prices in the international market from exporters is not conveyed to Kampung Jambu, the main driving factors for production activities are high consumer demand and globalization, while the biggest inhibiting factors for supply chains are climate and lack of manpower.

Kampung Jambu is expected to create collaboration for every supply chain actor, especially suppliers and consumers, and implement effective and efficient supply chain management.

Keywords: *Supply Chain Actors; Supply Chain Pattern; Supporting Factor; Barriers.*



I. INTRODUCTION

The development of guava agribusiness, especially in Kampung Jambu Cimaung, has experienced various problems related to supply chain management. These factors need to be considered in the design of the agricultural commodity supply chain. So in the future, it can achieve an effective, efficient, and sustainable supply chain system (Chopra & Meindl, 2013; Widyacantika & Azis, 2020).

Kampung Jambu Cimaung is a village that is engaged in agribusiness. It was established through the thousand villages program held by the West Java Government. In 2013 farmers from this village developed a new variety, namely Crystal Guava, and now it has become superior and much sought after by the public because of its crunchy taste and similar to apples. However, there are many obstacles that occur in the production process, including raw materials and other materials, as well as marketing aspects (Irijayanti et al., 2016). Therefore, it is necessary to carry out a supply chain analysis to determine the factors driving and inhibiting the supply chain in Kampung Jambu Cimaung.

Moreover, the need for fruit, especially guava is increasing because nowadays more consumers are concerned with a healthy lifestyle by consuming fruit to increase endurance, guava is also one of the type of fruit that can be consumed either directly or processed first. However, farmers have not been able to meet the needs of guava fruit both in quantity and quality, while the community's need for guava can increase along with population growth and consumer purchasing power (Heizer, *et al.*, 2017; Albab & Azis, 2021). The supply chain concept is to look at all integrated company activities, starting from the upstream part in the supply of raw materials to the downstream part in the product marketing and distribution process (Vanichchinchai, 2019).

In guava agribusiness, a good strategy requires a good supply chain, sales of guava in Kampung Jambu reach export markets such as Malaysia and Singapore, exporters need quality guava. Competition in agribusiness is getting tougher, which makes agribusiness survive, namely the availability of the right product for consumers at the right time. The availability of products can occur if there is good coordination between supply chain actors, the coordination is not only in the form of inventory coordination but also information about markets that are important for agribusiness planning (Irijayanti & Azis, 2017). The smooth supply chain activities of Kampung Jambu Cimaung are supported by the fulfillment of inorganic fertilizers that can help guava grow faster.

Thus, the purpose of this study is to explore the driving and inhibiting factors of the guava supply chain in Jambu Cimaung Village, by looking at the actors involved in the guava supply chain, as well



as product flow, financial flow, and the flow of guava supply chain information in Jambu Cimaung Village.

II. LITERATURE REVIEW

Discussions on product management and marketing of agricultural products, especially guava have been discussed quite a lot (Devi *et al.*, 2018; Ekawati *et al.*, 2019; Rizalul *et al.*, 2019; Suheli *et al.*, 2013; Wiyono *et al.*, 2015; Zaroni & Pujiati, 2019), however discussions related to the guava supply chain are still limited (Kurnia & Listanti, 2019; Premayanti *et al.*, 2019; Ambarsari *et al.*, 2007).

Supply chain management relates to logistics network is a coordinated system consisting of organization, human resources, activities, information, and other resources involved, together in moving a product or service either in physical or virtual form from a supplier to a customer (Arif, 2018:7; Azis & Azis, 2013). In the supply chain, several main players have the same interests (Pujawan & Mahendrawati, 2017; Puspawan & Azis, 2019), namely: (1) Suppliers, the supply chain starts from here, which is the source that provides the first material, where the chain distribution of goods will begin. (2) Supplier-Manufacturer, this stage is a place to convert or finish goods. The relationship between the two links already has the potential to make savings. (3) Supplier-Manufacturer-Distribution, in this stage the finished goods produced are distributed to customers, who usually use the services of distributors or wholesalers who are wholesalers in large quantities. (4) Supplier-Manufacturer-Distribution-Retail Outlets, from the wholesalers the goods are distributed to retail outlets. (5) Supplier-Manufacturer-Distribution-Retail Outlets, Customer, the customer is the last chain that is passed in the supply chain in this context as end-user. There are several links in the supply chain (Sugara & Azis, 2020), in this guava supply chain, there are at least 5 links as main actors.

Moreover, in the supply chain, there is three types of flows must be managed (Yuniarti *et al.*, 2018:3; Min, 2015). The first is financial flows, it flows from upstream to downstream and vice versa. Examples of financial flows from upstream to downstream are invoices, payment terms from suppliers to factories, from factories to distributors, and so on. Meanwhile, the financial flows from downstream to upstream are payments from factories to suppliers, from distributors to factories, and so on. The second flow is the flow of material from upstream to downstream and vice versa. Examples of material flow from upstream to downstream are materials sent by suppliers to factories, finished products sent



by factories to distributors, then retail, and then to final consumers. While the flow of material that flows from downstream to upstream is a product that needs to be returned, recycled, or repaired. The third flow is the flow of information that occurs from upstream to downstream or vice versa. An example of information from downstream to upstream is the amount of product inventory at each retailer. Examples of information from upstream to downstream are the production capacity of suppliers whose information is needed by the factory, information on the status of material delivery needed by the sending or receiving party. Thus the supply chain flow needs to pay attention to the flow of information, finance, and the flow of goods.

According to Bovet in Cahyono (2010:4) supply chain, competitive advantage is caused by six factors, including (1) consumer demand, (2) globalization, (3) competition, (4) communication and information technology, (5) government regulation, and (6) environment.

III. RESEARCH METHODS

Data collection techniques were carried out by collecting primary data, primary data obtained from direct observations regarding procurement to product supply, interviews or questions and answers were carried out with business owners in Kampung Jambu Cimaung, community empowerment cadres in Kampung Jambu Cimaung, and guava farmers in Kampung Jambu Cimaung directly to obtain information, especially regarding supply chain management in Kampung Jambu Cimaung, simple observations were made by observing the informants based on the answers the author received at the interview stage. The following is a simple observation procedure carried out: (1) preparing observation guidelines, (2) focusing observations with research objectives, (3) adjustment of the findings of the interview with field conditions.

Data analysis was carried out after the data collection process; the analysis was carried out to seek research by describing systematically, factually, and accurately from a state of events that occurred in Kampung Jambu Cimaung. According to Miles, et al. (2014) for the research procedures in qualitative analysis, follows these steps: (1) data reduction, (2) data presentation, (3) verification and concluding. This analysis is used to answer the third research objective written in chapter 1, which is to know the driving and inhibiting factors of the supply chain in Kampung Jambu Cimaung. Meanwhile, to answer the purpose of the first research, namely to find out the supply chain actors involved in the supply chain of Kampung Jambu Cimaung, the author conducted interviews with the owner of Kampung



Jambu Cimaung, namely Mr. Hj. Abdurahman, the owner of Kampung Jambu provided information about the actors involved in guava supply chain activities, from inorganic fertilizer suppliers to final consumers. Then to answer the second research objective written in chapter 1, which is to know the flow of products, finances, and information in Kampung Jambu Cimaung, the author conducted interviews with Mr. Abdurahman as the owner of Kampung Jambu Cimaung and Mr. Agus as a cadre of community empowerment, made simple observations to find out how the mechanism works. The supply chain that occurred in Kampung Jambu Cimaung and conducted a literature study to determine the supply-chain pattern, especially supply chain in agribusiness in theory and then it can be concluded how the mechanism of the product, financial and information flow that occurs in Kampung Jambu Cimaung.

IV. FINDINGS AND DISCUSSIONS

The supply chain actors of a commodity consist of two types of members, namely primary members who are parties directly involved in production activities and secondary members who are not directly involved in production activities but have important roles that support the smooth supply chain process. The following are the actors and activities carried out by the guava supply chain actors in Kampung Jambu Cimaung:

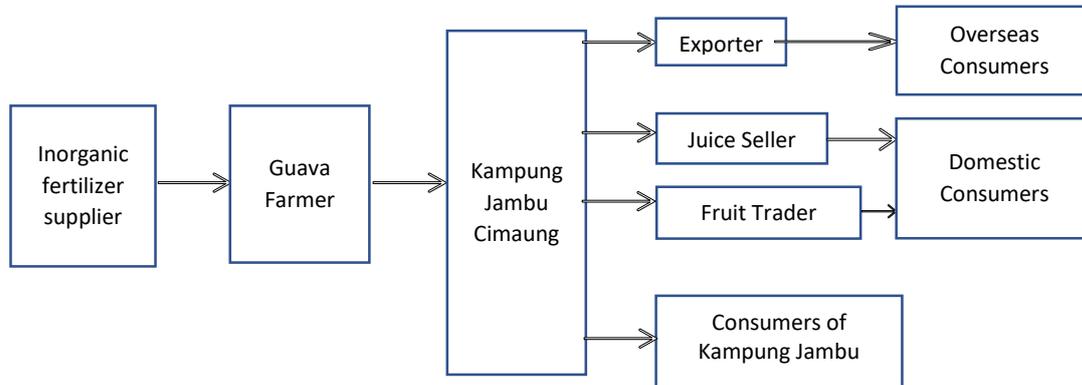
- 1) Inorganic Fertilizer Supplier. Suppliers are primary members and one of the important actors in the business process in providing raw materials for the company, Kampung Jambu cooperates with the supplier of Kios Fertilizer Sidiq Mandiri to meet the needs of inorganic fertilizers, Kampung Jambu requires inorganic fertilizer as fertilizer because inorganic fertilizer does not require a decomposition process so that it can be used as fertilizer. increase the production and quality of guava. Kampung Jambu chose a strategy of few suppliers, namely by only working with one supplier. However, there are times when the Sidiq Mandiri Fertilizer Kiosk cannot supply fertilizer to Kampung Jambu due to the scarcity of fertilizer, this can hamper the guava production process.
- 2) Farmer. Guava farmers already have a guava Standard Operating Procedure (SOP) in Cimaung District, this SOP can be a guide for good and correct guava cultivation, starting from land preparation, seed preparation, planting, fertilizing, grafting, irrigation, garden sanitation, to harvesting and postharvest handling.



- 3) Kampung Jambu Cimaung. Kampung Jambu Cimaung is a forum for farmers who are members of farmer groups and are primary members because they are directly involved in the guava production and cultivation process. Farmers consult with supply chain managers to coordinate and synergize every link involved in the production process, conduct training, guidance, and marketing of guava products through exporters, fruit traders, juice sellers, and consumers. This is done to achieve production targets.
- 4) Exporters. It is the party that carries out the process of distributing goods, the exporter who cooperates with Kampung Jambu, namely PT. Alamanda, where the company receives guava production from Kampung Jambu Cimaung and then distributes guava abroad for overseas consumers. PT. Alamanda orders, purchases, transports, and packs, and exports guava to foreign countries such as Malaysia and Singapore. The exporter and Kampung Jambu Cimaung entered into a cooperation contract in which Kampung Jambu had to fulfill the request of PT. Alamanda will give guava a minimum of 500 Kg per week, if it is not fulfilled then the Kampung Jambu will be subject to a fine according to the initial agreement with the exporter.
- 5) Juice Seller. Juice sellers are SMEs that produce fruit juices, one of which is guava juice which requires raw materials such as guava for the main needs of the juice. This juice seller sells in retail or per cup to final consumers and interacts directly with final consumers.
- 6) Fruit Trader. Fruit traders are small traders who sell various kinds of fruit, including guava fruit by kilo system to end consumers. These fruit traders are roadside or can be called street vendors around Cimaung District, these fruit traders interact directly with consumers.
- 7) Consumers of Kampung Jambu. Consumers of Kampung Jambu are consumers who buy guava directly to Kampung Jambu Cimaung, these consumers consist of people from the Cimaung sub-district and tourists who go on agro-tourism trips in Kampung Jambu Cimaung, these tourists usually bring guava home by buying souvenirs to be consumed, consumers can do their picking and choose guava, then weighing and payment in cash to Kampung Jambu Cimaung.
- 8) End Consumer. Consumers are the last chain of the supply chain, guava products can be consumed as fresh fruit or as raw materials to become processed products. Guava has two market groups, including the domestic market and foreign markets, there are quite a lot of

guava enthusiasts now because guava has health benefits and can be used as raw material for various processed products.

Figure 1. The actors of guava supply chain in Kampung Jambu Cimaung



Source: Extracted from the research, 2020.

Based on figure 1 and the explanations of the supply chain actors, it can be seen there are at least eight parties involved in supply chain management, including fertilizer suppliers, farmers, Kampung Jambu Cimaung, exporters, juice sellers, fruit traders, consumers of Kampung Jambu Cimaung and final consumers consisting of domestic consumers and foreign consumers, but exporters, fruit juice sellers and consumers of Kampung Jambu can be said to be in the same supply chain position, so it can be said that there are 5 links in production activities guava in Kampung Cimaung Jambu.

In line with the research of Kurnia & Listanti (2019) and Premayanti et al. (2019), the supply chain pattern consists of product flow, financial flow, and information flow that is formed from the procurement of raw materials, processing to use by the end consumer, the supply chain pattern process itself can be different depending on the number of parties involved during the production process, and the type of product. generated by the business activity.

The following is an overview of the guava supply chain in Kampung Jambu Cimaung. Product flow is generally carried out from upstream to downstream where the procurement of guava starts from fertilizer supplier Kios Pupuk Sidiq Mandiri which supplies inorganic fertilizer for the needs of Kampung Jambu in carrying out production activities, according to the quantity demanded from Kampung Jambu Cimaung and the schedule set. Kampung Jambu places an



order for inorganic fertilizer if the fertilizer supply is running low by contacting the supplier by telephone, the delivery of fertilizer is carried out no later than the next day after placing an order because the location of the supplier and Kampung Jambu Cimaung are close so it doesn't take long for delivery.

However, there are times when suppliers cannot supply fertilizer due to the scarcity of fertilizer, this hampers the guava production process because then Kampung Jambu does not get inorganic fertilizer as fertilizer and only relies on organic fertilizer for the guava fertilization process. Then the farmers carry out guava cultivation, farmers who are members of farmer groups sell their harvested guava to juice sellers, fruit traders, and end consumers. Some companies have collaborated with Kampung Jambu Cimaung, namely PT. Alamanda is an exporter where this company absorbs the yields of Kampung Jambu, the red brittle type, for export. Some parties have not collaborated with Kampung Jambu to absorb the harvest for the production of guava juice drinks.

Kampung Jambu implements a self-selecting system for companies that want to buy products in large quantities, both companies that have collaborated with exporters and those who have not cooperated, such as juice sellers. This is done to reduce the losses borne by Kampung Jambu and returns from the buyer. Usually PT. Alamanda chose guava with a maturity level of 60% because when it was exported, it would arrive with the right maturity level and not too ripe. While juice sellers, roadside traders, and end consumers usually choose guava with a maturity level of 80%. After sorting, the guava is weighed and payment is made according to the scales.

Financial flows in the guava supply chain occur to final consumers, consumers of Kampung Jambu, fruit traders, juice sellers, exporters, farmer groups in Kampung Jambu Cimaung, guava farmers, and fertilizer suppliers. The transaction system for consumers, fruit traders, and guava beverage companies is carried out in cash when the guava has been weighed, while for exporters it is done on credit or one week back payment, the payment is made when the Kampung Jambu sends for the next guava order, the transaction system from Kampung Jambu to suppliers is also made in cash, that is, after the fertilizer arrives, direct payments are made.

The flow of guava information also occurs to consumers, both foreign consumers, domestic consumers, and consumers of Kampung Jambu Cimaung, fruit traders, juice sellers, exporters, farmer groups in Kampung Jambu Cimaung, guava farmers, and fertilizer suppliers. This



information relates to the large number of guava requests needed by exporters, guava juice drink companies, fruit traders, and final consumers, the large supply of guava in Kampung Jambu Cimaung, the number of guavas that can meet buyer demand, fertilizer requests, and fertilizer supplies. However, there is one line of information that is not conveyed, namely the selling price of guava in the international market, so that farmers who are members of the Kampung Jambu farmer group do not know how much the selling price of guava is in foreign markets.

Furthermore, several factors mentioned in the research of Zaroni & Pujiati (2019) are in line with the results obtained in this guava research in product development. From the data analysis based on the results of interviews and simple observations that have been made, the following is obtained a discussion of the driving and inhibiting factors of the supply chain of Kampung Jambu Cimaung. The first factor that drives the supply chain of Kampung Jambu is consumer demand. So far, foreign demand has not been fulfilled, if consumer desires are not fulfilled then the supply chain will not work well because consumers will feel disappointed. Therefore, Kampung Jambu Cimaung needs to maintain relationships with consumers and understand consumer desires.

The next factor that drives Kampung Jambu Cimaung is the potential for developing guava as agro-tourism, Kampung Jambu runs its business through agro-tourism, this agro-tourism is supported by the existence of a fairly large area of land, most of which is spread in Cipinang Village, Cimaung District. Likewise, the growing popularity of Crystal Guava agro-tourism also encourages guava agribusiness.

The next factor is processed guava products, currently, the development of industries that process guava into food or beverages, especially in West Java is also one of the driving factors. Guava is a commodity that has a high respiration rate, this causes a shorter shelf life at room temperature but guava has the potential to be used as raw material for processed foods and beverages, such as being used for making cakes, chips, candy, guava juice drinks, juices, jams, , pudding, pickles, jelly, ice cream, and more.

The last factor that becomes the driving factor is globalization, the presence of consumers abroad and outside the region can create a wide range of supply flows. Kampung Jambu Cimaung has reached overseas consumers such as Malaysia and Singapore as well as outside the region in various regions in Indonesia.

According to Bovet in Cahyono (2010:4) where there is a match between several supply



chain driving factors, namely globalization and consumer demand, this is also in accordance with the research of Ambarsari *et al.* (2007). This factor is also the main factor driving the guava supply chain in Kampung Jambu Cimaung. However, until now the demand for guava continues to be unfulfilled, especially for export demand. This can be influenced by supply chain inhibiting factors and the inability of Kampung Jambu to predict future demand so that Kampung Jambu does not have an accurate forecast. Factors that may hinder the supply chain of Kampung Jambu Cimaung are pests, the pests that exist are fruit flies or can be called pests of *Bactrocera dorsalis*. These pests cause guavas that are almost ripe to cause brown spots on the surface of the guava, this is a symptom of disease in guava caused by pests, then the guava rots, there are maggots, holes and fall out so that it can cause the amount of guava produced to be incompatible with what is expected, because the guava is not following the standards, and cannot be sold to consumers. If this is allowed to continue, Kampung Jambu will suffer losses and can hamper supply chain activities.

The next factor is labor, the lack of manpower can have an impact at the time of harvest, when the harvest period the number of guavas that must be picked reaches tens of quintals, sometimes Kampung Jambu has difficulty in getting labor for picking the harvested guavas. This can be a bottleneck in supply chain activities because the process of picking guava which was supposed to be sent to exporters and guava juice companies will be delayed. The delay in the picking process can cause time delays, especially in the production process.

The next factor is security, the theft of guava by people who are not known, by taking in large quantities. This can reduce the amount of guava to be harvested. If the theft occurs continuously, Kampung Jambu will suffer losses, and cannot meet the needs of both consumers, exporters, juice sellers, and guava traders, because guava can continue to decrease. This factor occurs because of the lack of supervision from the Kampung Jambu so that it is easy to steal guava fruit. The guava plantations of Kampung Jambu are very large, so they need extra supervision.

The last factor is climate, the rainy season can inhibit guava growth and affect yield decline, the guava produced will be less than perfect, the guava harvest season occurs from November to February along with the rainy season. This can lead to a decrease in production levels due to guava yields that do not meet the standards and hamper supply chain activities, so there is a need



for plastic shading technology that can help prevent raindrops from being exposed to guava, so that guava productivity remains stable in the rainy season. This plastic shade is a plastic house in the form of a tunnel, the arch of the roof of the shade allows the solar radiation needed by the guava plant to enter, but the guava plant can avoid the rainfall which is an inhibiting factor of guava growth.

The main supply chain inhibiting factors are climate and labor, climatic factors are obstacles that are very often experienced, especially in the agribusiness sector because of the difficulty of avoiding and predicting good and bad weather, the lack of labor also causes supply chain activities to be hampered which causes unfulfilled consumer demand.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the discussion, the conclusions of this research is (1) there are 5 links in guava supply chain management activities in Kampung Jambu Cimaung, the actors starting from inorganic fertilizer suppliers namely Sidiq Mandiri Fertilizer Kiosk, guava farmers consisting of 12 farmers, Kampung Jambu Cimaung, exporters namely PT. Alamanda, juice seller, fruit traders, consumers of Kampung Jambu Cimaung to final consumers. (2) The flow of supply chain products is carried out from upstream to downstream, starting with the fulfillment of inorganic fertilizers in Kampung Jambu, then farmers who are members of farmer groups market their products to 4 parties. The supply chain financial flow is carried out in reverse from downstream to upstream, payments are made in cash unless the exporter to Kampung Jambu makes credit payments. Information flow is carried out by each supply chain actor, information in the form of guava availability, fertilizer availability, and consumer demand. (3) The biggest driving factor affecting the supply chain is the high demand for guava and the biggest inhibiting factor in the supply chain of Kampung Jambu is climate.

The following suggestions can be given: (1) to build open and transparent communication between supply chain actors to achieve the goal of supply chain management which is to balance demand and supply to make it more effective. To meet the need for inorganic fertilizers, Kampung Jambu Cimaung can implement a strategy of many suppliers, namely collaborating with other suppliers, without changing fertilizer suppliers so that when there is a shortage of fertilizer at one supplier, Kampung Jambu can receive inorganic fertilizers from other suppliers. (2) The Kampung Jambu is



expected to form an efficient supply chain management to increase productivity and expand the supply chain network, to strengthen the guava supply. To fulfill the demand for guava, Kampung Jambu Cimaung is better off not only focusing on selling guava, Kampung Jambu can introduce other types of guava contained in it to consumers, this is so that Kampung Jambu can still meet the demand for guava through substitute products. (3) Kampung Jambu can apply a collaborative process to consumers to overcome inhibiting factors and maintain driving factors in supply chain activities, this can increase profits for Kampung Jambu. To minimize the main inhibiting factor in the form of the climate of Kampung Jambu, it is necessary to learn more about guava cultivation such as buying guava cultivation books or reading guava cultivation articles as well as following technological developments to develop guava agribusiness and take care of guava to deal with the climate, especially the rainy season.

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