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Research Articles

Corn Value Chain in Dompu: Constraints and Alternative Policy Interventions to Improve the Value Chain

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ABSTRAK

Meskipun jagung telah menjadi komoditas pertanian yang umum ditanam oleh petani Dompu, masih ada beberapa kendala seperti terbatasnya pasokan input terutama pupuk. Akibatnya, petani tidak dapat mengikuti dosis pupuk yang dianjurkan yang menyebabkan rendahnya produktivitas. Studi ini dilakukan untuk mengidentifikasi secara jelas masalah dan kendala di sepanjang rantai nilai jagung, dan mengidentifikasi opsi untuk mengatasi masalah tersebut. Metode kuantitatif dan kualitatif diterapkan dalam penelitian ini. Temuan dari penelitian ini menunjukkan bahwa rantai nilai jagung sangat sederhana dimana petani menjual jagungnya ke pengepul tingkat desa bernama Palele, kemudian palele menjual jagungnya ke pengepul tingkat kecamatan, dan kemudian menjualnya ke pedagang atau eksportir . Adalah peran para eksportir ini untuk menjual jagung ke pulau lain dan atau ke pasar internasional. Isu-isu yang ditemukan dalam rantai nilai jagung adalah: pasokan pupuk yang terbatas, teknik pemupukan yang tidak sesuai, fluktuasi harga jagung, dan rendahnya produktivitas jagung. Direkomendasikan agar pemerintah daerah mengambil beberapa pilihan kebijakan untuk mengatasi masalah tersebut, dan meningkatkan kinerja rantai nilai yang pada akhirnya meningkatkan penghidupan petani kecil.

Kata kunci: jagung; nilai; rantai; kendala; intervensi

ABSTRACT

Even though corn has been a common agriculture commodity growing by Dompu farmers, few issues remain such as limited input supply especially fertilisers. As results, farmers could not follow the recomended fertiliser doses that lead to low productivity. This study was conducted to clearly identify the issues and constraints along the corn value chain, and identify options to address the issues. Quantitative and qualitative menthods were applied to the study. The findings from this study highlight that the corn value chain was very simple where farmers sell their corn to the village level collectors named as palele, then the palele sell the corn to the sub-district level collecotrs, and then they sell to the exporters. It is the roles of these exporters to sell the corn to other island and or to international markets. Issues found in the corn value chain are: the limited supply of fertilisers, broadcasting technique for fertilizer application, corn price fluctuation, and low corn productivity. It is recomended that the local government take few policy options to address the issues, and improve the value chain performance that lead to better smallholder farmers' livelihood improvement.

Key words: corn; value; chain; constraints; interventions

INTRODUCTION

Agriculture remains as an importance sector in Dompu in particular, and in West Nusa Tenggara and Indonesia in general as its the main source of income and food to smallholders, and employment for most of rural communities (The Ministry of Agriculture of Republic of Indonesia, 2016). Due to its values and contribution to the local government and communities' livelihoods, the national as well as the local governments are continue to support agricultural development through various policies and programs such as Bimas, Inmas, Insus, Supra Insus, farming credits, farmer field school, Pijar, and others (Muktasam, 2000; Muktasam, Suadnya, Martinda, & Ayu.S., 2007; Muktasam, Gatot, & Sofwan, 2017; Muktasam, Wayan, Nurjannah, & Kisworo, 2017).

Food crops as one sector among the others has also been an important sector to the economy and rural smallholders. In the National Strategic Plan for Agricultural Development 2015-2019, the vision of food crop development is food self-suficiency – food security and food safety. The strategies to srengthen agricultural development and food security are through (1) increasing production and land use, (2) increasing support for infrastructure and facilities, (3) seeds and seedling development, (4) strengthening farmers' institutions, (5) strengthening financial supports, (6) bioindustry and bioenergy development, and (7) strengthening marketing network (The Ministry of Agriculture of Republic of Indonesia, 2016).

Corn as the top five agricultural commodity has also got more attention for increasing the productivity and production where in West Nusa Tenggara and also in Dompu the Local government launched special programs for its that well known as Pijar Program (for West Nusa Tenggara) and Corn District (for Dompu). Dompus has been the second corn production areas of West Nusa Tenggara after Sumbawa, where in 2015 the total corn production was about 218,855 tons (22.8%) - Total harvested area of 29,813 ha and productivity 7.3 tons per ha, while Sumbawa produced 329,885 tons from the total corn production of 959,973 tons of West Nusa Tenggara (BPS, 2018). The Innovative Farming Systems and Capability for Agribusiness (IFSCA) Project in Dompu is in-line with these government programs, and supporting to increase the production and smallholders' livelihood. This collaborative action-research project between the University of Mataram, Indonesia and Massey University - New Zealand supported the study aims to address issues found in corn development policies and programs – especially the production and marketing with specific intention to help smallholder farmers meet the market demand. The objectives of the study are to: (1) understand the existing characteristics of corn value chains, (2) identify constraints and opportunities of the existing corn value chains, and (3) develope alternative interventions in improving the existing value chain performance which may lead to smallholders' livelihood improvement.

RESEARCH METHODS

This study was conducted in Dompu using qualitative and quatitative research approaches (Tashakkori & Creswell, 2007) in data collection, processing, and data analysis (M4P, 2008; Flewelling, Fox, Puspadi, & Adar, 2013; Mango, et al., 2018). Secondary data was collected from different institutions, while the primary data were collected from key actors in the value chains, from input suppliers, farmers, collectors and traders or exporters.

Data collection was carried out using focus group discussion (FGD) at farmer group level (2 FGDs), in-depth interviews with value chain actors such as input suppliers, farmers,

collectors and traders. Farmers at the farmer group level were selected through simple random sampling method while the selection of collectors and traders was done through purposive sampling method following the snowball technique applied in identifying the nex level actors after interviewing corn farmers. Identification and the selection of respondents was also done through "back-ward" approach where the interview at traders for example led to the identification of collectors, and farmers. Then interviews continued to the collectors and farmers. The total numbers of interviews for the study were 25 conducted by the project team that consist of 9 farmers, 2 sub-district collectors (working with 21 "palele" or village level collectors), and 3 inter-island traders (PT. Sun, Pak Wiliam, and Pk Joko).

The value chain study identified the core processes in the value chain, main actors involved in the core processes, the flow of products and services, value chain actors' knowledge on market information and the flow of information, the volume of products, number of actors and jobs, the values of products at different levels of value chain, the relationship and linkage between value chain actors, the exist of governance/coordination/integration within the chains, the constraints and potential solutions, and others. Quantitative and qualitative data processing and analysis were applied to the study.

RESULTS AND DISCUSSION

Mapping of Main Processes

On the basis of the FGDs and in-depth interview with corn value chain actors, from farmers to the corn big traders in Dompu (there 3 big corn traders, namely PT Sun, Pk Wiliam, and Pk Joko), it was found that the corn value chai is simple and involving five categories of actors, namely input *suppliers*, *farmers*, *village* and *subdistrict level collectors*, and *traders*. The flow of the products, corn with about 17% water content was identified from farmers to collectors, traders and feed industries in East Java and Philipine – Figure 1.

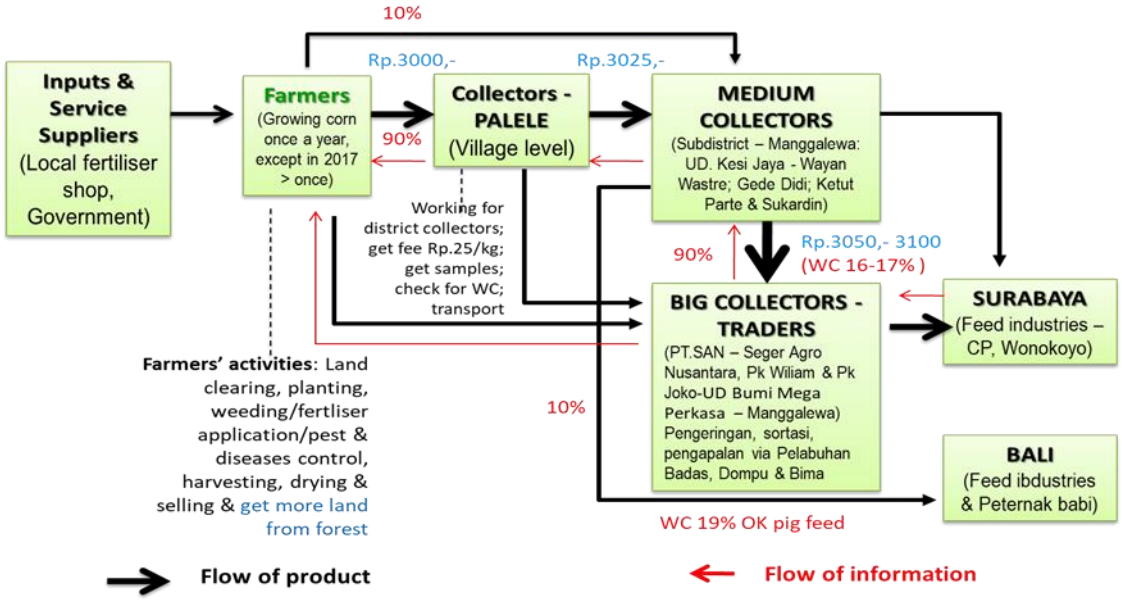

Figure 1. Corn Value Chain[E1][u2]

The Figure shows that farmers have 3 options to sell their corn, (1) *Farmers to local collectors or Palele* whom mostly working for sub-district collectors. The *Palele* are mostly

from the same or nearby villages. Farmers may call for collectors to come or palele may call farmers asking for corn. *It is the most common practice of selling corn (90% of the total selling),* and there is small incentive to sell directly to subdistrict collectors (get an extra Rp.25 that usualy goes to palele), but may have some risk on water contents, (2) *Farmers to sub-district collectors such as Sinar Kesi or Kesi Jaya* (about 10% of the total corn production), and (3) *Farmers to the big collectors such as* PT Sun, Pk Wiliam, and Pk Joko, however this option has a risk when the company claime for hight water content – the farmers should bring the corn back or get the lower price. The market information flow from industry to collectors and farmers was identified has been effective as the farmers understood the prices for certaint corn quality.

Value Chain Actors and Their Activities

Input Suppliers: Major inputs for corn production are hybrid seed, fertlisers, chemicals such as herbicide and pesticides, and labours. The suppliers of these inputs could be agricultural input shops in Dompu and Bima, government agencies, farmers, and community groups for labours. The numbers of inputs suppliers are limited as the government is the only an authority to decide who is going to be fertiliser and chamical distributors or suppliers for both subsidised and non-subsidised inputs such as fertlisers. In Dompu, there 2 private agencies appointed by the government as subsidised fertliser distributors, namely CV. Sumber Alam at Simpasai Village, and CV Utan Putri – at Woja Subdistrict. The main activities of inputs suppliers are to supply and distribute inputs to the corn farmers and or corn farmer groups.

Corn Farmers: Most farmers are male and they belong to three etnic groups, namely Bimanese, Balinese and Sasak (the transmigrant farmers from Bali and Lombok). They grow corn on the dry land once a year on their own land or rented from other farmers. An average land occupation for corn was about 1.82 ha with a range between 1 ha to 3.5 ha. An average corn production was about 5.92 ton per ha with a range between 4.5 ton to 6.5 ton per ha. The family size range bwtween 4 to 8 persons. The common issues riased by the corn farmers was the scarcity of fertlisers during the planting season, and this led to the limited fertiliser application for the crop and then led to low productivity. Broadcasting technique to fertiliser application was found to be an issue by the Project Team, but it was perceived as time consuming and complicated by the corn farmers. They rejected to use the recommended fertilizer application by placing the fertilizer under the soil which is called as *"tugal and or larikan methods"*. The main activities of farmers are: land clearing, land preparation, *buying seeds, planting, maintenance* (weeding and fertiliser application, pest control), harvesting, corn shelling, drying, packaging, weighing, and selling. Male and female farmers are involved in the activities where male farmers mostly work on all activities, while female farmers are involved in planting, weeding, fertiliser application, and harvesting.

Corn farmers use both household labours and or paid labours for planting and harvesting which depend on the farming scale. For those farmers managing large land, paid labour is the common practice.

Farmers sell their corn which meet the traders' requirements such as 16-17% Water Contents. Some traders may get the corn with 19% water content for their Balinese buyers which is used as pig feeding.

Cost associated with corn farming mostly spend for inputs such as seeds, fertilisers, chemicals, and labour, and varies according the land size. More labours are needed during the harvest, and farmers found difficult to get them during the peak harvesting season. This gives an oppotunity to migrant workers from Sumba to work as harvesting labour. Farmers claimed that they get cash for corn farming from Banks (Bank Rakyat Indonesia or BRI) and in some cases from selling their cattles.

Drying the corn to reduce the water content up to 16 to 17% is the other activity of the corn farmers that may take 2 days during the good sunlight. Farmers are also doing something to keep the corn clean. Farmers do not do grading, sortation, and storage for the corn as the palele mostly transport the corn once its reached the standard water content.

Corn Village level Collectors – Palele: Local collectors are mostly male farmers whom are living at the same village or at the nearby villages. These collectors are working closely with sub-distric level traders or collectors. They usually have established close relations for years to help each others. The local collectors mostly work for the sub-disctrict collectors, no cash and get IDR. 25.0 fee or commission per kg of corn they collected, and by working with local collectors, the sub-district collectors may get the corn more easily. The collectors age range between 25 to 50 years old. The local collectors know well when to collect corn from local farmers as they know the harvesting time. The collectors firstly contact farmers and asking for their willingness to sell their corn and once farmers agreed, then the collectors bring a glass of corn to the sub-disctrict collectors to check its moisture content. When the watter content meet the standard (16-18%), then the local collectors and subdistrict collectors bargain for the price, and once they agreed with farmers on the price (tend to be determinded by the sub-disctrict collectors), the collectors then take an action to do packaging and transporting the corn to subdistrict collectors' storage. All costs for sacking and transport paid by the subdistrict collectors (such as UD. Kesi Jaya or UD. Sinar Kesi). Sometimes, the subdistrict collectors do additional activities such as drying for the corn with higher watter contents.

Corn Subdistrict level Collectors: Only few subdistrict level corn collectors operating in Dompu mentioned by farmers such as Pk Wayan Wastre (the owner of PT. Kesi Jaya, and working with 11 palele or village level collectors), Pk Gede Santre (the owner of UD. Sari Kesi, working with 10 palele or village level collectors), Wayan Wastre, Gede Didi, Ketut Parte, and Pk Sukardin. They are all male and belong to Balinese and Javanese etnic groups. These subdistrict level collectors may have facilities such as drying floor, trucks, and storages. They employ some labours for handling activities such as drying, load and un-loading the corn from and to the truck. The main activities of the collectors are buying corn from farmers through local level collectors or from local farmers, transporting the corn from farmer gates to their locations and storage, drying if its needed, sortation and grading, and selling the corn to the inter-island traders (the 3 corn companies – PT. Sun, Pk Wiliam and Pk Joko). These local collectors sell their corn to poultry and pig industries in Bali and East Java (Surabaya and Pasuruan). The corn sold to Bali may have higher level water content (could be 19%) and lower quality corn. Some collectors (UD. Kesi Jaya) may even working and supporting farmers (15 farmers mentioned by the collectors) with seeds and fertilisers and they may pay the price after harvesting. According to the collectors, the prices were informed by the buyers such as CV. Cahaya Permata Indah Nusantara (CV. CPIN), and the buyers from East Java (Pasuruan and Surabaya), and Kalimantan.

Corn Inter-island Traders: There were only 3 big corn traders in Dompu who have their own big storage with some supporting facilties such as proccessing plant, drying floor, transportation, and supporting staff and labours. They are PT. San and other two companies belong to Pk Wiliam and Pk Joko. The farmers and collectors do not know the exat name of the companies but just mentioned the name of the owners as they said Pk Willian (CV.Cahaya Permata Indah Nusantara or CV. CPIN) and Pk Joko. These traders located around Manggelewa sub-districts along Sumbawa main road. The main activities of these traders are buying corn from local subdistrict level collectors such as UD. Kesi Jaya and UD. Sinar Kesi, and also from farmers. They also do drying, packaging, transporting and shipping the corn to Surabaya, Jakarta, and Kalimantan. The subdistrict level corn collectors may also sell the corn directly to East Java buyers (the poultry industries) such as at Pasuruan and Surabaya. So far, there is no much issues found by the traders in meeting the demands and dealing with local collectors and farmers. The corn quality standard has been shared openly with all different suppliers – local collectors and farmers.

Truck and other modes of transportation services were identified in the study. Some trucks and pick-up transportation services were exist to support the traders and sub-disctrict level collectors. These transportation services may use daily contract or the cost per transportation rate or volumes (sacks). For long distance transportation modes, the traders and collectors use the big trucks (Fuso) while for short distance transportation the collectors and traders use the small trucks or even the pick-up car (L300).

Women Farmers' Roles in the Value Chain: Even though the study found a more simple nature of corn value chain, there still few issues in the chain such as the local farmers' perceptions of the recommended agricultural practices. Farmers perceived that fertiliser supply was limited and difficult to get it during the planting season, and its application was so complex which take more time and hight cost. These finding in line with Rogers' concept of innovations' characteristics that affecting farmers' innovation decision making where farmers tend to adopt those innovations that have a relative advantage and low complexity (Rogers, 1983). Local farmers wanted the government could add the supply of fertilisers. Farmers peceived that fertiliser application recommended by the IFSCA Project Team (put the fertilisers around the corn plant and or insert under the top soil along the row, instead of broadcasting) was more complex and high cost. As results, some farmers are reluctant to apply the technique as it was also take more time, more labours, and more money. The findings are consistent with the others studies such as those reported in (Jones-Garcia & Krishna, 2021).

The study found a strategic roles of women farmers in the corn agribusiness system, especially in the planting, fertiliser application, harvesting, and other activities (including in the marketing desision making process). However, women farmer groups who worked for fertliser application claimed for its compexity, time consuming, and more cost for labours.

It is critical that the extension activities need to address these issues by inviting women farmers in the extension acitivities and let them learned the advantages of implementing the recommended improved technologies such as fertiliser applications. These practices will in turn promote corn high productivity – clear cost and benefit analysis is required and compare it with theexisting local farmers' practices.

Corn Value Chain Constraints

The common constraints identified in the study are as follow:

(1) *Corn farmers applied the fertilisers by broadcasting, and it is perceived as a very simple and easier way. In fact it is against the IFSCA Project recommendation*. Farmers actually understand the advantages of the recommended practice, but not interested to apply it as it is reflected from the following statement:

> *"....no one want to follow the recommended practice for the fertilizer application...its too complex, even though the results are diferent 2 tones to 3 tones, however the problem is in making and planting in the hole, our physical powers are not so strong, then we need to pay the labour group again..." (as it was stated by 3 farmers in Suka Damai Village).*

(2) Difficultines in getting fertilizers such as urea, poska, ZA lead to low fertilizer application, and as results lead to low productivity; Farmer pay 97,000.0 rupiah per sack for subsidice fertilizers, and pay for 300,000.0 rupiah per sack for non-subsidice fertilizers.

(3) Corn p*rice fluctuation* - lower price during peak harvesting season and higher price during low season.

(4) *Low quality seeds from government* compared to those sell by the private input shops.

Possible Interventions to Address the Issues

Four possible options and interventions to address the issues associated with corn value chain are as follow:

(1) *Policy options* are needed to address issues identified in the existing corn value chain in the area of *inputs supply*, *farmers' practices*, and *corn value added processes* where local government and farmers' institutions are involved. ***The first option*** is on *input supply* should be directed to promote effective supply of good quality fertilicers in the amount that meet the ideal needs of the corn farmers. Once this issue addressed, then the farmers may adopt recommended practices in fertiliser doses and on an appropriate time. ***The second option*** is how to *encourage farmers to adopt good agricultural practices* such as adequate amount of doses, and proper practices for fertiliser application (put the fertilisers in the hole or row instead of broadcasting). ***The third policy option*** is to promote value added process at the local level that may lead to more options for selling corn. The government needs to open the chance to process the local corn into feed and food industries. These may lead to more options for farmers to sell their product and the bargaining position may increase and the price could be much better. These options in addressing the issues is supported by the findings from other study on corn business in Dompu (Kurniawan, Ananda, Saputra, & Khusaini, 2022).

(2) *Extension activities at the community or farmer group level* to share the plot and farm demonstration trials, and to convince farmers for the results of the adoption of good agricultural practices – ideal fertliser doses and fertiliser application methods. Study visit by farmers and farmer groups to the success farmers who implementing the fertiliser and the application techniques could be a sound option. This approach will not only improve farmers' knowledge, but also to change farmers' attitudes on the need to follow the right doses, and better practices of fertiliser application – following the concept of *seeing is*

believing in agricultural extension science (Kondylis, Mueller, & Zhu, 2017; Kondylis, Mueller, & Zhu, 2014; Van den Ban & Hawkins, 1985).

(3) *Conduct district and village level workshops* to share the IFSCA findings on value chain studies, soil demonstration tirals, and others. These may lead to not only knowledge changes and improvement, but also to attitude changes, and follow-up Action Plan.

CONCLUSIONS

The following conclusions are made from the corn value chain study: (1) The existing corn value chain is charaterised by the involvement of five major value chain actors as it is presented in Figure 1, namely input suppliers, farmers, village and subdistrict level collectors, and big collectors or inter-island traders. Due to the limited traders, the information on product price and quality is clear to the all actors. Corn farmers' options in selling their corn are limited. Corn farmers only have three options to sell their corn, but most farmers prefer to sell their corn to the village level collectors or Palele whom mostly working with sub-district level corn collectors. There is no incetive to sell the corn directly to other buyers such as PT. Sun, Wiliam and Pak Joko as the price tend to be the same, while there is a risk associated with corn watter contents. (2) Few contraints were found in the corn value chain, such as limited fertiliser supply, and fertiliser application techniques, and corn price fluctuation. These issues were perceived as more complex, involving more actors, and need more cost and more time. (3) Policy intervention options are needed to address the existing corn value chain issues and constraints. More effective extension activities are suggested to improve farmers' knowledge and skills and to changes their attitudes.[E3]

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