



**THE STUDY OF PRODUCTION AND MARKETING OF MAIZE  
IN KUPANG AND TIMOR TENGAH SELATAN DISTRICTS  
EAST NUSA TENGGARA PROVINCE**

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# **THE STUDY OF PRODUCTION AND MARKETING OF MAIZE IN KUPANG AND TTS DISTRICS**

## **I. INTRODUCTION**

Maize is the most important food crop in East Nusa Tenggara Province, especially in Timor Island. Since the main staple for local people is maize, farmer always cultivate maize on their dry lands during cropping season. Generally, farmers in this region are practicing a semi-modern farming system by combining both manual and mechanized cultivation techniques. However, almost all of farmers never use tractors and other modern inputs such as fertilizers or pesticides for their crops. That is why the actual productivity of maize in this region is lower than the potential productivity of maize itself. A recently conducted scoping study at showed that yield of maize in Timor was <2.5 tonnes/Ha, which was significantly lower than that achieved at national level (> 3.5 tonnes/ha) (BPS, 2010).

Usually, maize is planted randomly without spacing and together with other food crops such as casava and pulses. Maize ears are left to dry off in the field before harvesting and the harvest will be hung at the ceiling of the kitchen house to receive smoke for preventing the maize being destroyed by the maize beetle. On the other hand, almost all farmers will leave cassava in the field to be harvested only during the period of starvation (October-December). This makes economic valuation of cassava difficult.

In relation to the production of maize in Timor, secondary data show that maize production is dominated by three local landraces (Kupang, TTS and TTU) comprising a mixture of plant types and maturities. The predominant variety cultivated by farmers in Timor is local variety with low productivity.

Badan Bimas Ketahanan Pangan NTT (2010) reported that there are about 83 387 ha of land in Kupang and TTS districts are used for maize cultivation in 2009. This number accounts for 34 % of total land for maize cultivation in NTT province in that year. The productivity of local variety of maize is about 2.57 ton/ha in average and the total production of maize for the



districts of Kupang and TTS is about 209 627 ton in 2009 or 33% of maize production in NTT (Recalculated from Table 1.1).

Table 1.1. Land Cultivation and Productivity of Maize in Selected Areas , 2009

District	Harvesting (Ha)	Production (Ton)	Productivity (Ton/Ha)
Kupang	24 675	62 320	2,53
TTS	58 712	147 307	2,51
NTT	248 536	638 402	2,57

Source: Badan Bimas Ketahanan Pangan NTT, 2010

Some important issues that have to be addressed in relation to the survey of maize production, productivity and marketing in Kupang and TTS Districts are description of production and the availability of maize during the year, distribution of production centre throughtout the island, the quality of local maize in comparison with other maize, the price of local maize as well as other maize imported from outside of Timor Island, and the marketing channel, etc.

## **II. OBJECTIVES**

The main objective of the survey is to identify availability of production and marketing of local maize in Kupang and TTS districts in West Timor. Detailed Objectives of this survey are as follows:

- (1) Provide an analysis of maize availability in the districts of Kupang and Timor Tengah Selatan, in terms of quantity, quality, seasonality, etc.
- (2) Provide information about types/variety of maized produced in this two districts.
- (3) Provide a comparative analysis of maize price (by season) and a comprehensive analysis of the local market (potensial suppliers, supply and demand behaviour, distribution system analysis, etc.)
- (4) Provide a detailed list on farmers groups, cooperatives registered in the two districts that have potential to supply WFP with maize or maize grits.
- (5) Identify the best opportunities for procurement and recommendations.

### III. METHODOLOGY

#### 3.1. Data Collection

This study use a multistage sampling method in selecting sample markets and respondents. The first stage will to decide sample markets by using a purposive sampling technique. The market places chosen to represent all the traditional market places in both districts will be the ones which are considered to be the busiest market places. Therefore, in Kupang, the market samples are Pasar Inpres Naikoten Kupang, Oesao, Baun, Camplong, Takari. Whereas, market places in TTS are Pasar Inpres Kota SoE (city market), Niki-niki and Oinlasi (central TTS area), Panite and Batu Putih (South TTS) and Kapan in the North TTS district.

The second stage is to choose survey respondents. At least 4 respondents in each market location, consisting of farmers and traders at different levels (collectors or retailers). Respondents will be chosen by using also purposive sampling technique (stopping people on the street method). The total samples are 49 respondents (22 farmers, 7 collectors, 16 retailers and 4 inter-island traders).

This study dealt primarily with survey data regarding production and consumption pattern, and data related to local markets (selling and buying outlets), key market players (suppliers and buyers), marketing volumes and channels (distributions), marketing cost, price and margin analyses, mode of transportations, product movements, nature of competition (market structures), logistics or stand point facilities and material or product handling.

Data on production and consumption pattern obtained from secondary sources such as Badan Pusat Statistik (BPS) and Food Crop Office publication, or other related sources. Interviews will also be conducted to Government staff at related department such as Food Crop; Industry, Trade and Cooperative Department at District or provincial levels (to find out general information related to production, consumption, demand, price, and market policies). Another piece of information accompanying description of the quantity and quality of Maize will be the climatic variables. For this purpose, total rainfall and daily air temperature during the Maize growing season of the Maize production centres will also be described. These pieces of information will be obtained from secondary sources.

### **3.2. Data Analysis**

The main analysis of marketing of maize in this study are marketing channels (supply chain pattern), marketing volume (production and consumption pattern), marketing cost-price (efficiency) and margin analyses. A comparative analysis between channels and market locations will be done based on the information gathered from the two districts; especially in accordance with prices and margins created by different types of channels and markets. In relation to descriptive analysis of maize production and marketing systems, the study covers also some other important aspects, including quality and seasonality of maize availability; types or varieties of maize produced; product movements, modes of transport, logistics, type of consumer segments, market information, and product order processing, etc. Detailed lists of farmer groups and cooperatives registered in Kupang and TTS that have potential to supply WFP with maize provided.

All resulting data will first be tabulated in a spread sheet format (MS Excel, 2007) before subjected to analysis.

## IV. WORLD AND INDONESIA MAIZE PRODUCTION

### 4.1. World Maize Production

Maize (*Zea mays* (L)) is a universal commodity and has been cultivated in more than 100 countries in 6 continents. In 2008, Indonesia was seventh best production contributor to the world (16 323 922 ton or 2.3% of the 20<sup>th</sup> to countries world maize production in 2008), after USA, China, Brazil, Mexico, Argentina, India (Figure 4.1) (FAOstat, 2008).

Even though Indonesia is a seventh largest maize producer, land productivity for maize remaining low (4.2 ton/ha) compared to world productivity (5.8 ton/ha). It reflected low production technology in maize cultivation in Indonesia. In other hand, maize farming scale were done by smallholder farmers with less then 1 ha land ownership, was made low farming efficiency. Low quality is one of the barrier Indonesian maize to enter global market.

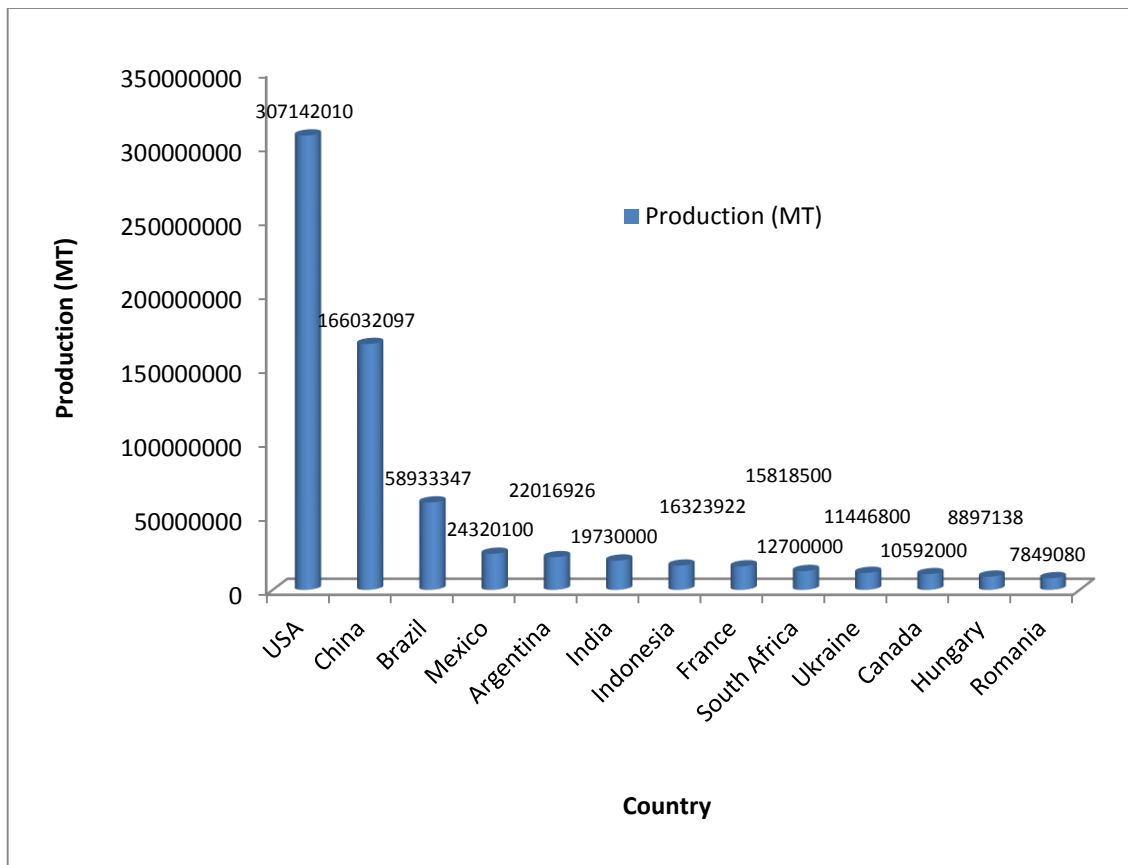


Figure 4.1. World Maize Production in 2008.

Source: FAOSTAT, 2008.

## 4.2. Indonesia Maize Production

Maize is one of the most important cereals for Indonesia and this commodity is cultivated for domestic market demand either for food and especially feed (accounting for about 51 percent of feed ingredient). However many people in Indonesia especially in the eastern part of Indonesia (NTT) are consume maize as one of main staples for daily consumption. Maize production in Indonesia is dominated by supply from Java. Since the last decade, most of maize grown in Java (57 %) and contributed for about 61 % to national maize production. At the same time 43 % maize grown outside of Java and contributed for about 39 % to national production of maize. However, maize area of cultivation in Java tend to decrease over time because of many factors, such as population pressure and land conversion. On the other hand, during the period of 1970 – 2000, maize area of cultivation outside Java tend to increase at a rate of 1.97 % per year. This increasing is caused by the expansion of land cultivation created by the government extensification program of maize as well as market creation.

At the national level, Indonesia got the peak of production growth occurred during the period of 1980-1990, with the average production grew at a rate of 5.37 % per year. This performance is determined by the improvement of technology contributed for increasing of yield from 1.46 t/ha in 1980 to about 2.13 t/ha in 1990. At the same time the area planted to maize grew at a rate of 1.45% per year, with the peak of growth during 2000-2009 (Indonesia Stat, 2000-2009). At the time period of 2000-2009, the growth rate of area, production and yield of maize in Indonesia was increased again, after worsen growth during 1990-2000. Trend of increasing area, production and yield of maize since 1970 can be seen in the following table.

Table 4.1. Growth Rate of Area, Production and Yield of Maize in Indonesia, 1970-2000.

Period	Growth rate (%/year)		
	Area	Production	Yield
1970 – 1980	-0.72	3.52	4.28
1980 – 1990	1.45	5.37	3.85
1990 - 2000	0.92	3.33	2.40
Average 1970 - 2000	0.55	0.55	3.51
2000-2009 <sup>(*)</sup>	1.52	4.34	3.33

Source: IFAD and CIMMYT, 1970-2000; and Indonesia Stat, 2000-2009<sup>(\*)</sup>

Although area of cultivation, production and yield tend to increase from year to year, there were some constraints to adoption of technology in relation to improve all three indicators above (Subandi 1998; Suhariyanto 2000; Maamun et al 2001; Kasryno 2002) i.e. :

- (i) Maize is grown mainly (89%) in rainfed and dryland areas, with low soil fertility and erratic rainfall, and is often exposed to drought condition
- (ii) Maize is growth in less developed or remote areas
- (iii) Farmers are small landholders, have little formal education, lack cash capital. And, therefore, are not able to apply modern inputs (seed, fertilizer, chemicals) properly.
- (iv) There are no price incentive for the gain, and price of inputs are high
- (v) Distance of maize production areas from seed and feed industries can be large
- (vi) Poor management system make it difficult to ensure good seed quality
- (vii) Improve hybrids bred by Government research institutes receive little promotion. On the other hand, hybrids bred by private companies are expensive.

These constraint are absolutely not the same for each province in Indonesia, and it determines different productivity of maize come out from each province. Detail information of maize production according to the production region (province) might be followed in the next table.

Table 4.2. Trend of Maize Production In Indonesia According to Province, 2005 – 2009 (ton)

Province	2005	2006	2007	2008	2009	Average 2005-2009	Rank
East Java	4398502	4011182	4252182	5053107	5071544	4557303.4	1
Central Java	2191258	1856023	2233992	2679914	2796274	2351492.2	2
Lampung	1439000	1183982	1346821	1809886	2060712	1568080.2	3
Sulawesi Selatan	705995	696084	969955	1195691	1322561	978057.2	4
Sumatera Utara	735456	682024	804850	1098969	1190822	902424.2	5
West Java	587186	573263	577513	639822	686561	612869	6
Nusa Tenggara Timur	552440	582964	514360	673112	636778	591930.8	7
Gorontalo	400046	416222	572785	753598	729781	574486.4	8
Sulawesi Utara	195305	242714	406759	466041	467841	355732	9
Sumatera Barat	157147	202298	223233	351843	403800	267664.2	10
DI Yogyakarta	248960	223620	258187	285372	302885	263804.8	11
Nusa Tenggara Barat	96458	103963	120612	196263	293854	162230	12

**Table 4.2. Continued**

Province	2005	2006	2007	2008	2009	Average 2005- 2009	Rank
Kalimantan Barat	127458	136777	154118	181407	144078	148767.6	13
Aceh Darussalam	94426	96838	125155	112894	141073	114077.2	14
Sulawesi Tengah	67618	66433	119324	136907	135572	105170.8	15
Bengkulu	84089	82296	83385	111826	93256	90970.4	16
Sumatera Selatan	75566	73896	84081	101439	98032	86602.8	17
Sulawesi Tenggara	73153	74672	97037	93064	66186	80822.4	18
Kalimantan Selatan	48103	58283	100957	95064	97326	79946.6	19
Bali	81884	78105	69209	77619	83512	78065.8	20
Riau	36421	34728	40410	47959	48473	41598.2	21
Jambi	29697	29288	30028	34616	38760	32477.8	22
Sulawesi Barat	17343	18109	26633	40252	40263	28520	23
Banten	29751	24417	20723	20169	25093	24030.6	24
Maluku	14262	14888	15685	18924	16509	16053.6	25
Kalimantan Timur	11180	14410	11620	12795	13697	12740.4	26
Maluku Utara	9914	10727	10793	11493	18528	12291	27
Papua	6164	6843	7053	7155	7159	6874.8	28
Kalimantan Tengah	2400	7367	3971	5982	6553	5254.6	29
Papua Barat	3317	3130	2428	1711	1238	2364.8	30
Kep. Bangka Belitung	945	990	904	393	440	2198.6	31
Kepulauan Riau	290	436	439	531	526	922.2	32
DKI Jakarta	37	36	20	20	17	49	33

Source: Indonesian Stat. 2010

It can be seen from the above table that in average Nusa Tenggara Timur Province is the seventh production centre of maize after Java (East, Central and West), Lampung and Sulawesi (South and North). If all the provinces are clustered according to the region (island) it can be concluded that Java is the most priority of maize production centre so far followed by Sulawesi and Nusa Tenggara (See Figure 4.2). The detail data on production, harvested area and productivity of maize by province in Indonesia, presented in Annex 4.1.



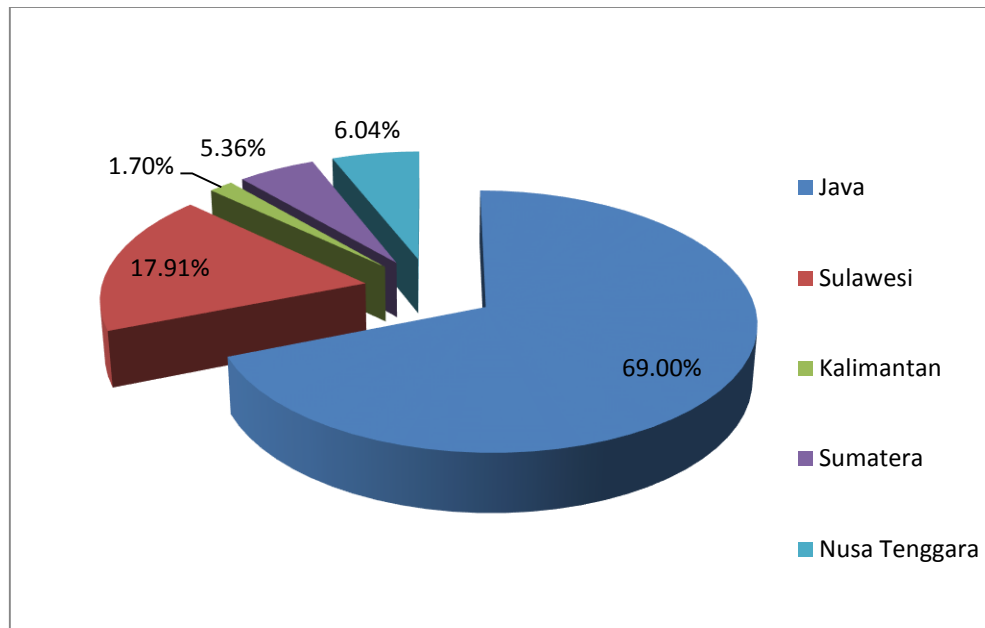


Figure 4.2. Contribution of National Maize Production According to Production Centres  
 Source: Secondary data analysis based on Indonesian Stat. 2010

The considerable production growth of maize, however, failed to meet the domestic demand, causing a rapid increase in its net imports since 1976. During 1969 – 1975, Indonesia was self sufficient in maize, with sufficient indicators of 1.02 to 1.26 (Adnyana et al. 2001). Since 1976 net imports has increased from 0.05 million tons in 1976 to 0.60 million in 1996 and reach its peak of 1.20 million metric tons in 2000. Now Indonesia still has a net imports of maize for more than 1 million tons. This indication shows that we need a breakthrough by deciding new strategy policy alternatives to increase maize production either for export or import substitution.

## V. MAIZE PRODUCTION IN EAST NUSA TENGGARA PROVINCE AND TIMOR TENGAH SELATAN AND KUPANG DISTRICTS

### 5.1. Maize Production in East Nusa Tenggara Province

Data from the office of BPS NTT (2008, 2009, 2010) show an average harvest area and maize production for East Nusa Tenggara Province for the last three years is  $245577 \pm 26742.6$  ha and  $608588.3 \pm 83417.9$  tons, respectively (Figure 5.1 and 5.2.). This quite a substantial variability of production is affected by the variation in harvest area which probably attributable to climate related disturbances. Beside year to year variation of maize production, it is noticeable that the maize production also varies with District (Figure 5.2.). The highest production areas are mostly located in Timor Island. Timor Tengah Selatan (TTS) ranks the highest, followed, in the descending order, by Belu, Kupang, and Timor Tengah Utara (TTU) Districts. The total harvest area and the total production of these districts occupy 53.8% and 53.4% of the total harvest area and production of the province, respectively.

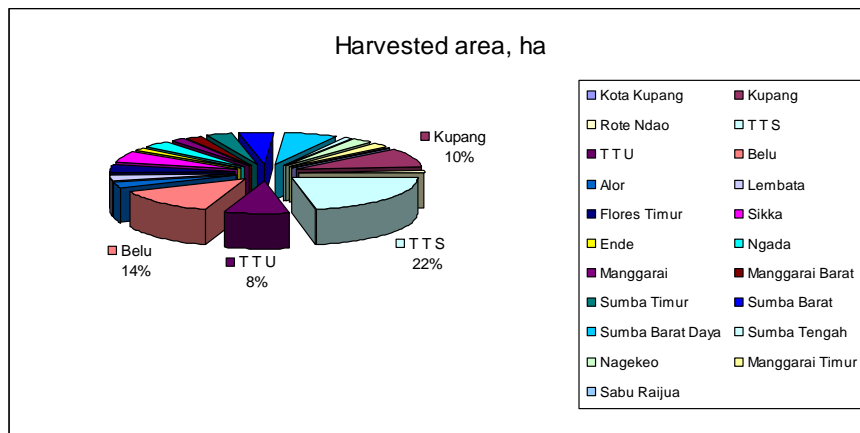


Figure 5.1. Harvest area of maize in the province of East Nusa Tenggara year 2007 to 2009 (BPS NTT, 2008, 2009, 2010)

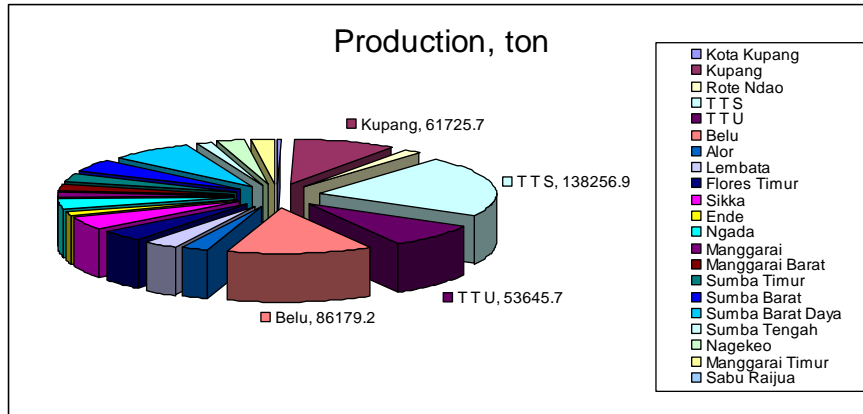


Figure 5.2. Maize production of the Province of East Nusa Tenggara year 2007 to 2009  
 Source: BPS NTT, 2008, 2009, 2010

Based on the harvest area and the total production figures of the province, it can be inferred that the average maize productivity of the province is 2.5 ton ha<sup>-1</sup> which is a little bit lower than the national maize productivity (3.2 to ha<sup>-1</sup>). This figure positions NTT as the 4th rank in maize productivity. National maize data show that NTT ranks 5th and 7th for harvest area and total production, respectively.

## 5.2. Maize Production in Kupang District

The break down of maize harvest area in Kupang District shows that there are 10 out of 21 sub districts of Kupang make up 70% of maize harvest area in the district namely, in descending order, Takari (contributes 11%), Kupang Tengah (9%), Amarasi Timur (8%), Amfoang Utara (7%), Fatuleu (7%); Amabi Oefeto Timur (6%), Amarasi Barat (6%), Semau (6%), Amarasi Selatan (5%), and Taebenu (5%) (Figure 5.3).

With almost similar maize productivity (mostly 2.4 ton ha<sup>-1</sup>) the production of each subdistrict of the District of Kupang follows the same pattern as for the harvest area. All the ten subdistrict that contribute to the largest portion of harvest area in the district, also produce 68% of the total maize production in Kupang District (Figure 5.4.)

The geographic distribution of maize harvest area, maize productivity, and total production in Kupang district are presented in Appendices 5.4.1, 5.4.2, and 5.4.3.

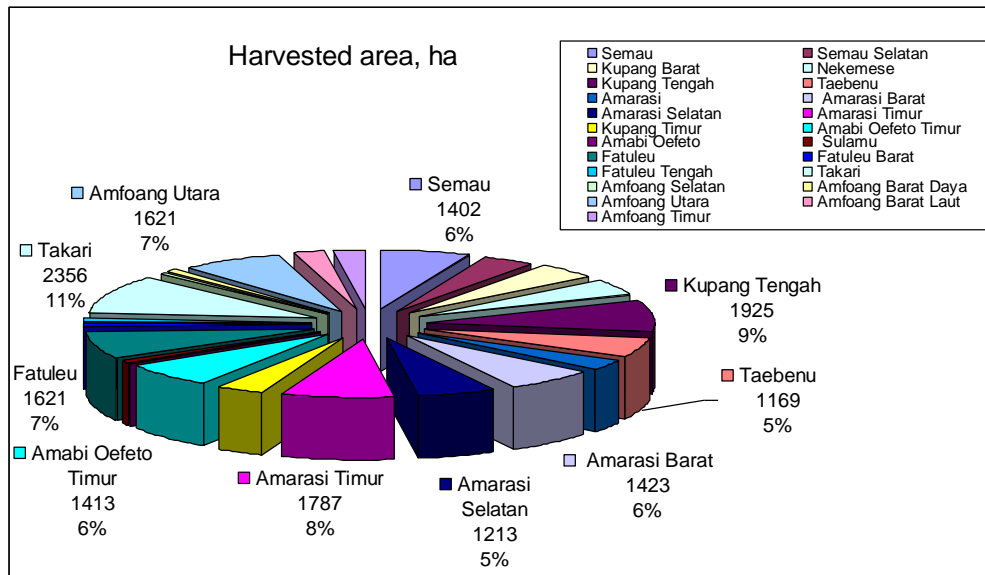


Figure 5.3. Harvest area (ha) of maize in the sub-districts of Kupang District year 2008  
Source: BPS NTT, 2009.

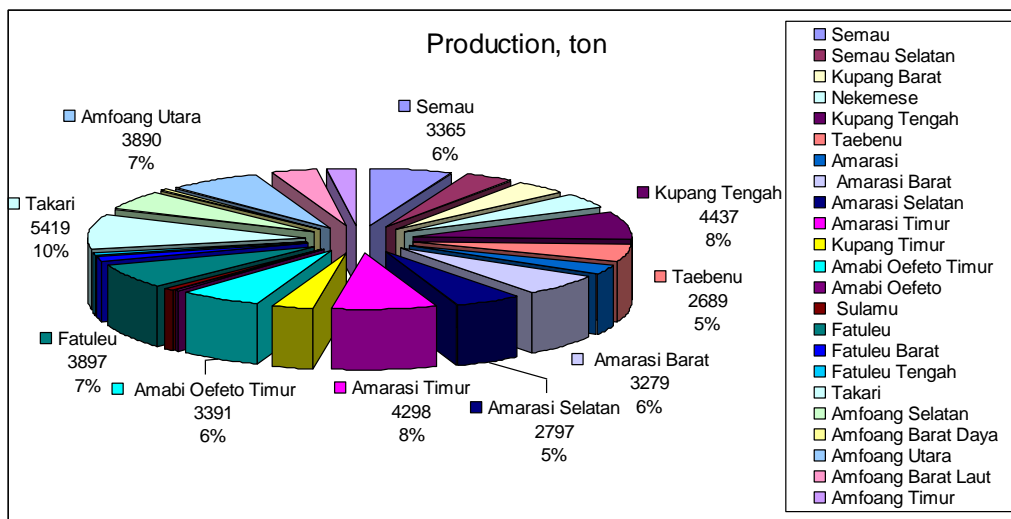


Figure 5.4. Total production of maize (ton) in the sub-districts of Kupang District year 2008  
Source: BPS NTT, 2009

### 5.3. Maize Production in District of Timor Tengah Selatan (TTS)

Eighty two percent of maize harvest area in TTS District is located in 15 out of 32 sub-districts of TTS (Figure 5.5). This figure will change as data from the expanded (newly formed) sub-districts are available. The contribution of each of the sub-districts to the total harvest area ranges from 4% to 6%. If we consider only the sub-district that contribute at least 4% to the total maize production of the district, there are only 12 out of 32 sub-districts and their total contribution is 74% (Figure 5.6.). The figures of harvest area and production generate the maize productivity of the area as much as 1.2 ton ha<sup>-1</sup> which is very low compared to the national maize productivity.

The geographic representation of harvest area, productivity, and the total production in each sub-district of TTS are presented in Appendices 5.4.4, 5.4.5, and 5.4.6.

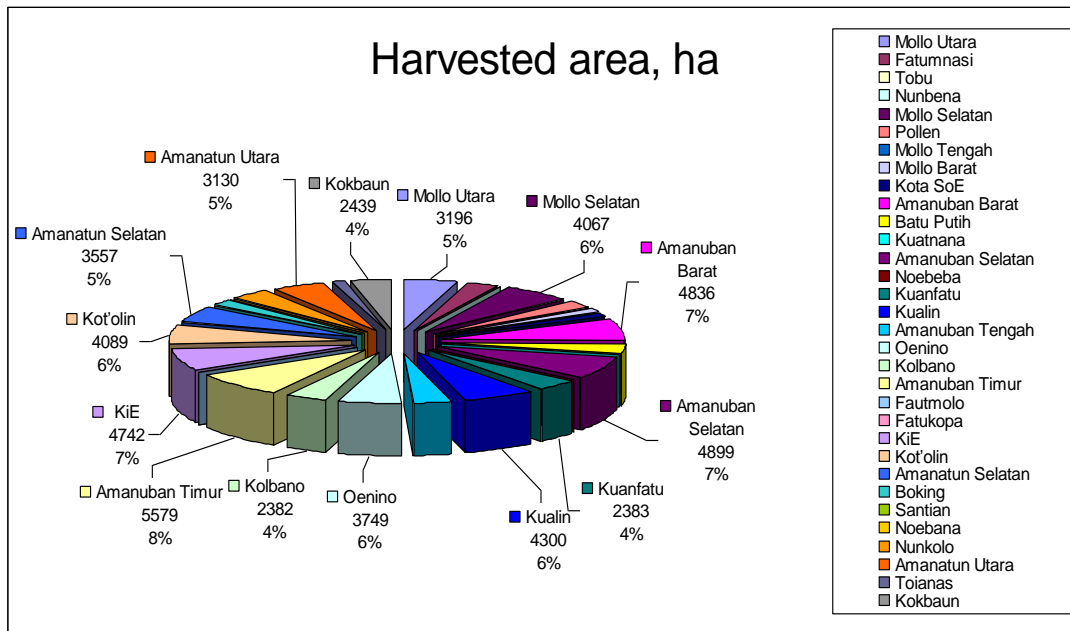


Figure 5.5. Harvest area (ha) of maize in the sub-districts of Timor Tengah Selatan (TTS) District (average of 2007 to 2009) (BPS NTT, 2008, 2009, 2010).

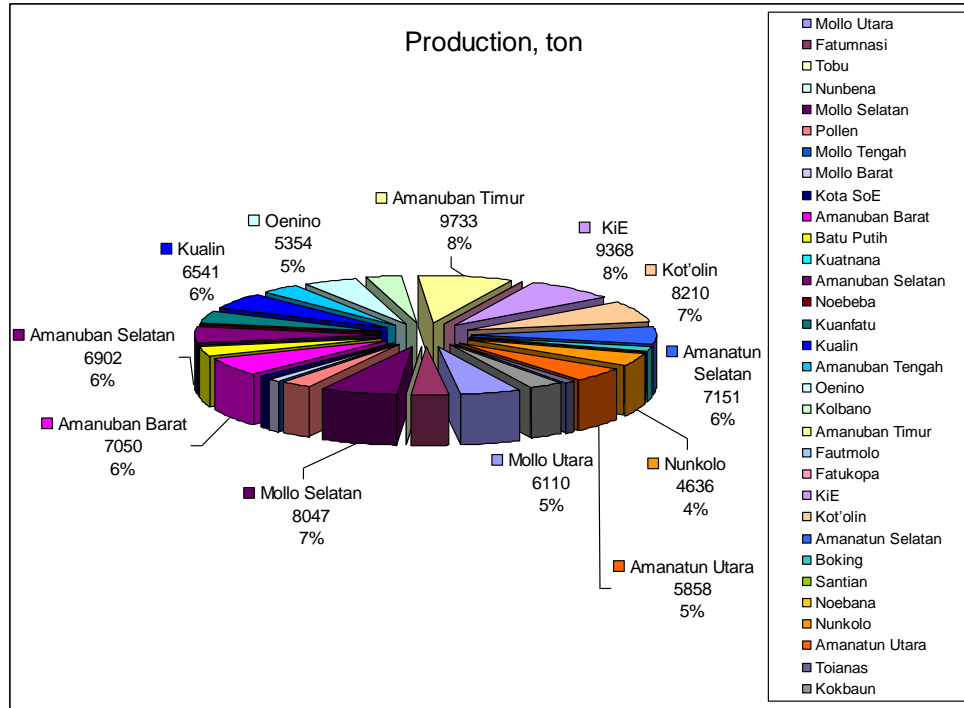


Figure 5.6. Total production (ton) of maize in the sub-districts of Timor Tengah Selatan (TTS) District (average of 2007 to 2009)

Source: BPS NTT, 2008, 2009, 2010

#### 5.4. Factors Affecting Production

Total production of maize is affected by agronomic, climatic, and edaphic, as well as social related factors. No single factor is dominant; instead, all these factors interrelated in determining maize production. However, for the sake of systematic explanation, each factors will be described separately.

Based on experience, agronomic, climatic and climate related, and edaphic factors affecting maize production are seed quality, weed infestation, available water and rainfall, plant population, pre- and post- harvest pest destruction, depth of soil solum.

In general, Timorese farmers faced all these factors in their maize production business. They normally utilize seeds that they secure from previous harvest. Very rarely that they use high quality seed (certified seed). The only time farmers use certified seeds is when they receive the seed aid from government offices of NGOs. Even so, the seeds from the previous planting are

kept for the next planting. The reason for this attitude is partly due to the fact that there is lack of extension and lack of access of farmers to certified seeds.

Our market observations of the dry maize seeds sold (representing maize varieties whose seed are normally used by farmers) in the markets in Niki-niki, Soe, Kapan, and Panite of TTS District as well as markeets of Camplong, Oesao, and Inpres Kupang (Figure 5.7) revealed the notion that seeds planted by farmers are of low qualities. Maize seeds found in the markets are of white (flint and dent types) and yellow (flint); however, when the seeds were further observed, actually there were 6% to 14% impurities due to the presence of other maize varieties (types and color) (Figure 5.8).

Weed infestation become one of the prominent factors that deter farmers from having planted large acreage of land for maize. Beside the abundance of weed, the lateness of weeding also contribute much to the decline of yield. Nowadays, the farmers started to have access to herbicides which make weeding become easier.

Rainfall irregularities in time and amount of rain frequently prevent farmers from harvesting good yield even from planting. When relating the maize production trend as mentioned above, it shows a weak relationship between maize production and rainfall for respected years (2007 to 2009). Rainfall data show that during the last ten years the variability of rainfall of TTS and Kupang (Figure 5.9) increased from 2007 to 2008 and decreased in 2009 which coincide with the trend of maize production for pertaining years. Therefore, there should be other factors such as climate related destruction such as pest infestation and lodging due to strong wind especially areas on highlands such as the upland of TTS.

Another phenomenon that occurs now in Timor with the high rainfall in Timor resulted in many farmers do not plant maize with the compalin of too much water that does not allow them to slash and burn for land preparation.

The monthly rainfall is utilized here to show the growing season which normally starts in November and December and ends (harvest time) in March to May. This monthly rainfall data also can be used to explain the availability of maize in the market; high and cheap around harvest and increasingly rare and expensive toward the dry season and peak around planting time.

Maize population is normally less than it is supposed to be due to the presence of stones and irregular planting distance. The percentage of rock outcrops in most farmers field can reach 10 to 20 % area. Also the irregular planting distance can reduce up to 30% maize population.





Measuring cans made out of 1 kg margarine containers



Buyer for human consumption



Different measuring cans and different maize types. Lower left side is one-year smoked maize kernels (darker color)



Maize and rice are sold side by side



Vendor measures maize with measuring can (c.a 800 g)



Buyer of maize for chicken

Figure 5.7. Maize sold in markets in Timor Tengah Selatan dan Kupang Districts consists of white and yellow colored maize.





Flint white maize with yellow and purple seed impurities



Dent white with flint maize impurity



Yellow maize with white and purple impurities



White maize with yellow impurities

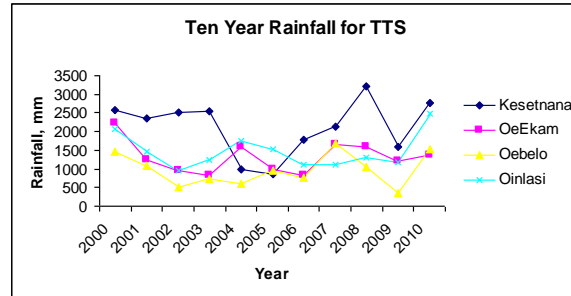
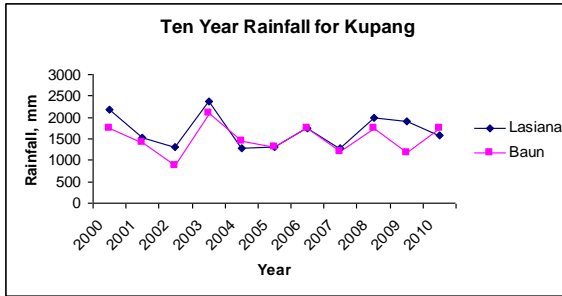


Glutinous maize seem not to contain any impurities; but actually there is impurity (see right picture)



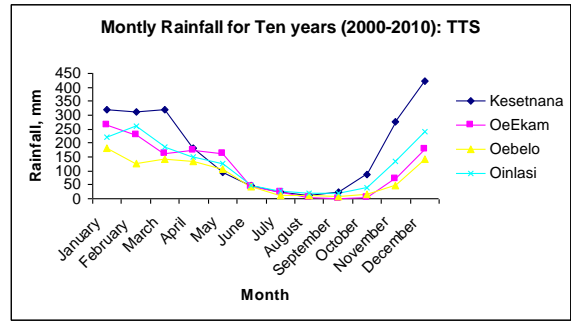
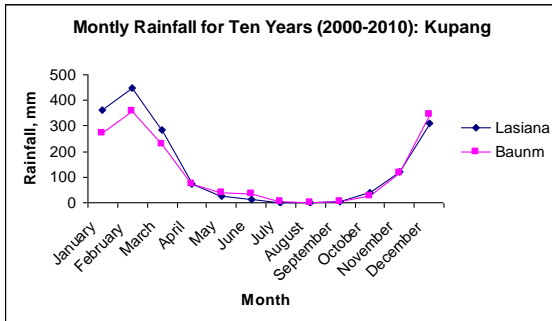
Glutinous (waxy)maize with white flint impurity

Figure 5.8. Different maize types sold in local markets of Timor Tengah Selatan and Kupang Districts. It consists of white and yellow maize types with varying degrees of other type impurities.



Ten year rainfall trend for TTS

Ten year rainfall tren for Kupang



Monthly rainfall for TTS

Monthly rainfall for Kupang

Figure 5.9. Yearly and monthly rainfall for ten years for TTS and Kupang Districts.

The lack of labor also determines the area planted and harvested. With the high mobilization of young generations to cities and the availability of alternative informal jobs such as “ojek” drive young people away from farms. Therefore, only old people who still dedicate their time and energy to work in the maize business. This in effect reduces planting area and slow the agronomic operations (which in turn reduces area planted).

### 5.5. Maize types and products sold in local markets

Field obserations in local markets of the two districts revealed that maize and maize products varies with markets. Based on kernel colors, there are two kinds of maize marketed and most probably consumed in TTS and Kupang i.e. yellow and white maizes. White maize is probably more preffered than white maize as the price of white maize is higher than that of yellow maize. However, as mentioned above, they are not of pure hybrids.

Besides the two major groups, there are also glutinous white maize, especially encountered in Panite market in TTS. In TTS (Kota Soe and Panite markets) vendors also sold “black maize or smoked maize”. Maize whose kernels were poured in palm leaf baskets on the



ceilings and smoked till the kernels become dark to very dark color due to soot. This kind of maize does not show any sign of being infested by maize weevil; however, as shown in Figure 5.10, it is attacked by mice (in the picture there is a mice faeces). This indicates that the maize is not healthy to be a food stock as it is contaminated by mice defecation and urination. The germ (embryo) of maize is encroached by mice which further reduce the quality of this kind of maize.



Bran (left) and de-hulled maize ('bose')(right)



Black maize (left) and bran (right)



Black maize (one year storage)



Black maize (three year storage). Notice the kernels are encroached by mice



Weevil infested maize

Figur 5.10. Very low quality of maize sold in local markets of TTS and Kupang

In the market, we also found heavy weevil infested maize sold in the market for pig and chicken feed. The price is low (Rp.1000 per measuring can) but the demand is high in the area of Niki-niki.

People also sell maize bran. Maize bran is the by product in de-hulled (“jagung bose”). According to biology of maize seed, bran consists of pericarp and tip cap of maize (Figure 5.11). This means that the bran still contains some nutrients for animals. Normally, the bran is utilized as supplemental feed for pigs.

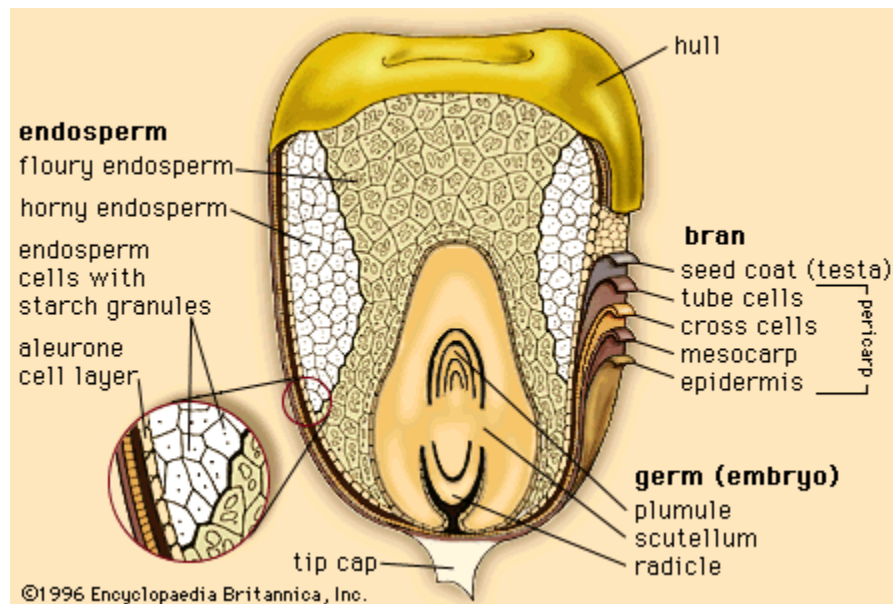


Figure 5.11. Maize kernel and its parts

Source: [www.britanica.com](http://www.britanica.com)

## VI. MAIZE MARKETING IN KUPANG AND TTS DISTRICTS

### 6.1. Market Characteristics & Participants

Maize farming in East Nusa Tenggara, especially in TTS and Kupang, mainly purposed not for cash crop, because 70% of the crops were not sold to the market, but for daily need consumption. Even though it was already market orientation 30%), the farming remained using simple technology with minimum advance farming input. Farmers sell maize at traditional markets (weekly markets in sub district center). They sell mixture produce (maize, peanuts and cassava).

Marketing is an important activity to obtain value and profit form produced crops. With marketing every player, individually or in group, would get their needs by creating or trade product they had have with other individual or group (Kotler, 1993). Marketing is performance on every activity which was needed for conception (business philosophy), price, promotion, distribution of idea, product and services, to create exchange value to satisfied organization or individual goal (Burns Alvin C & Ronald D.F. Bush, 2000). In an economics point of view, marketing is a productive activity that brought some utilities, such as place utility, time utility, form utility, ownership utility.

Marketing process embedded to marketing entity role. Marketing function rolled by marketing entity such as:

- a. Producers (farmers) take an exchange function (selling function), physic function (transport function and storage function) and facilities providing function (risk taking function and financing function). A producer farmer means a person who actively cultivates maize as well as participates in marketing activity. Producer farmer had some alternative to market crops, which were sold it out to end consumer or to whole seller or to retail seller.
- b. Collectors take role in exchange function (selling and buying function), physic function (storage), service providing function (packaging function). Collector is a trader who actively collect and purchase maize from producer directly and sold it out to retail seller or inter islands trader. Collector usually works and lives in near producing village to have good and close relationship with producer.

- c. Retailer role was in exchange function (sell and buy function), physic function (storage) and facilities providing function (standardization and grading function). In maize supply chain, retailer usually a small trader who sold maize directly to consumer or sometimes to other retailer. Retailer sold mix commodity in store, including vegetables and pulses.
- d. Inter-island trader takes role in exchange function (inter-island trading and purchasing function), physic function(storage) and facilities providing function (standardization and grading)

Marketing activities conducted by maize stakeholders in TTS and Kupang are presented in Table 6.1.

**Tabel 6.1. Harvested and Postharvested Activities at Different Level of Maize Marketing Entities in TTS and Kupang in 2010**

Stakeholders*	Harvested and Postharvested Activities*
Farmer	Harvested and simply cleaned by separated it from dirt, dry leave, packed then sold it. Grading and labeling was not applied. Farmers also, manually, processed white maize kernel become dehulled maize ( <i>bose</i> ) and sold it to markets
Collector	No particular treatment. Received maize was sold soon after obtain profitable amount to cover cost. Some collectors also processed maize to become maize dehulled, very fine grits and other types of maize grits to sell in markets
Retailer	Purchase the crop from collector and/or farmer, and sold it back to end user. There no specific treatment to improve quality. Some retailers also processed maize to become maize dehulled, very fine grits and other types of maize grits to sell in markets
Inter-island Trader	Drying, cleaning, packaging (with out label), chemical for pest and disease in storage were applied. Between 8-10 % dirt was left in this particular activity. Inter-island traders also processed maize to become maize grits for feed or other needs using their own machinery.

\* : stakeholders and types of activities are the same for the two district study areas.

Source: Primary data, 2011

## **6.2. Maize Supply Chain in Kupang and TTS**

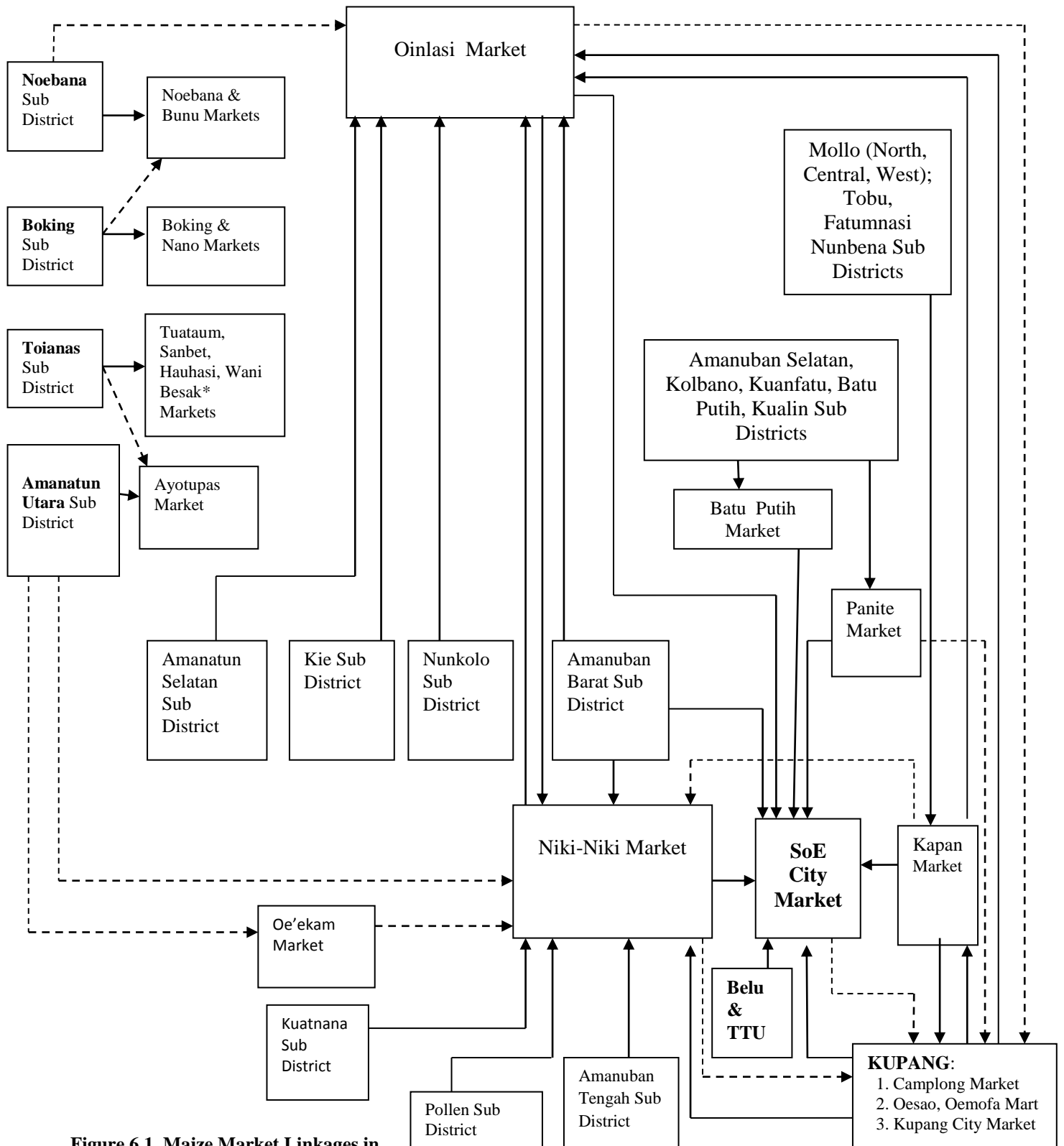
### **6.2.1. Marketing Channels**

Maize supply chain involved maize marketing entities. Those entities are taking role on marketing activities or function from producer farmer to end user. Marketing entities in maize supply chain are producer and trader (Figure 6.1 and 6.2).

Explained above that maize marketing is through several channel and phase before delivered to end user. Overall market linkages for maize in TTS sub district in West Timor showed in Figure 6.1. It can be seen that maize from Noebana, Boking, Toianas and Amanatun Utara Sub District mainly (99%) marketed in local markets located in villages or sub district center. It is about 1%, in irregular base, products from those 4 remote sub districts marketed to other places in Oinlasi or Niki-Niki or Oe'ekam or to SoE city markets. On the other hand, maize from other places such as from Kapan in Mollo Sub district, Southern part of Belu district and Kupang district can be marketed in those markets. The major competitors for Noebana, Boking, Toianas and Aamanatun Utara maize are from other sub districts in TTS, Belu and Kupang districts (Figure 6.1).

On the otherhand, marketing chanel in Kupang District are shown in Figure 6.2. It can be seen that, like in TTS, Kupang city market is the center of marketing target activities during maize season in April to September. Kupang markets receive maize from various suppliers namely from Surabaya, Makasar, Belu, TTS, TTS, Rote, Sabu or from sub districts around Kupang city (Takari, Semau, Camplong, Oesao, Amarasi and Amfoang. These sub district markets also have inter-linkages with other sub district markets or with other district markets in West Tomor.

Interview results with inter-island traders in Kupang showed that collectors or inter-island traders in Kupang, even in TTS, do not receive maize from Flores, Alor or Sumba islands, due to high transportation costs. However, maize from Java and Makasar enter Kupang markets, through inter-island traders in Kupang, with low cost and the same price with local maize (Rp. 2450 per kg). On the other hand, maize from Java and Makasar has a good quality. It is because of the technology production in those areas is better than West Timor one, particluarly in terms of maize variety. Farmers in Java and Makasar planted hibryd variety, while West Timor farmers dominantly planted local variety noted as low quality maize variety.



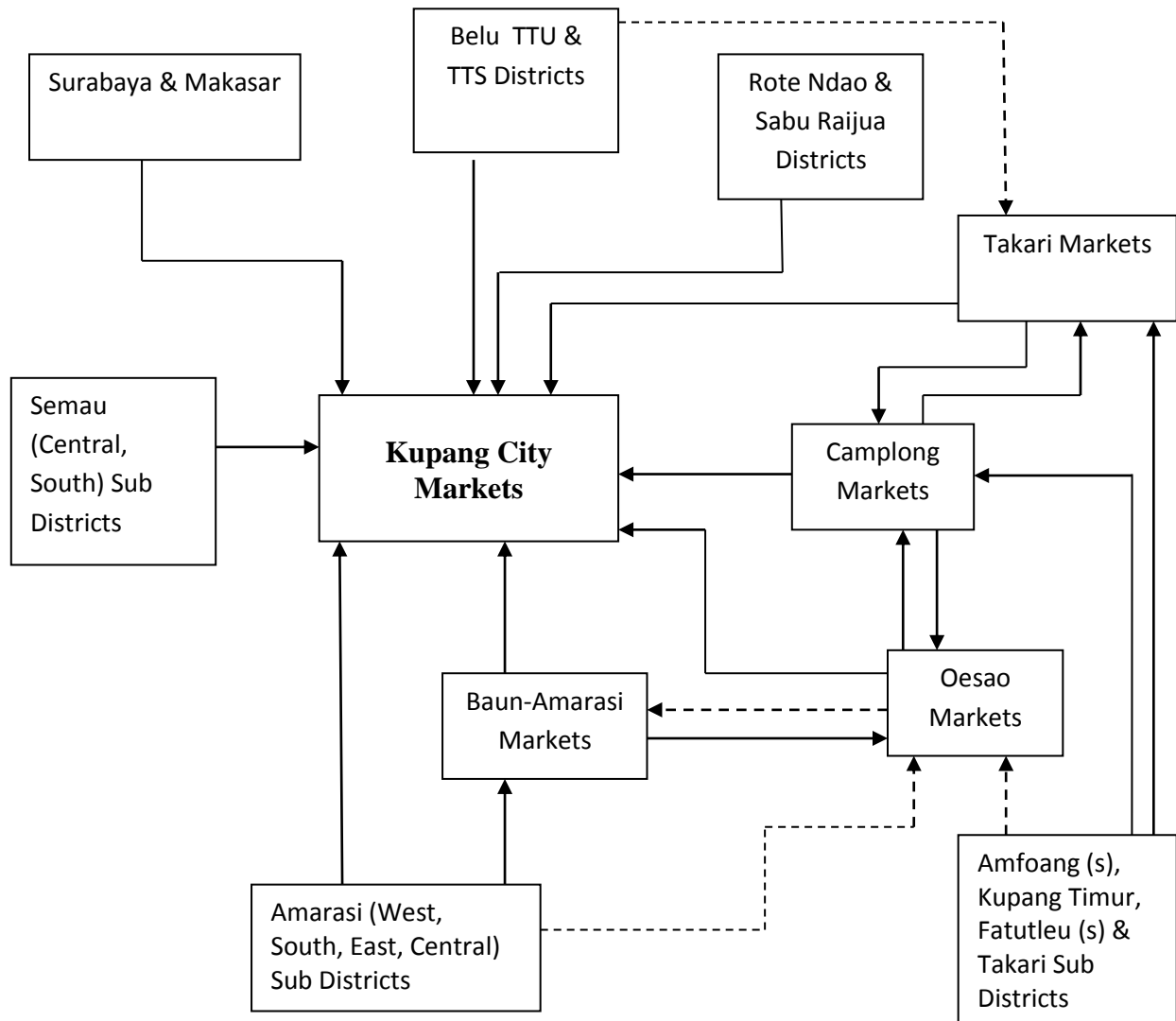
**Figure 6.1. Maize Market Linkages in TTS District in West Timor.**

Source: Primary Data, 2011

————> : Regular maize marketing activity during seasons  
 .....> : irregular maize marketing activity during seasons



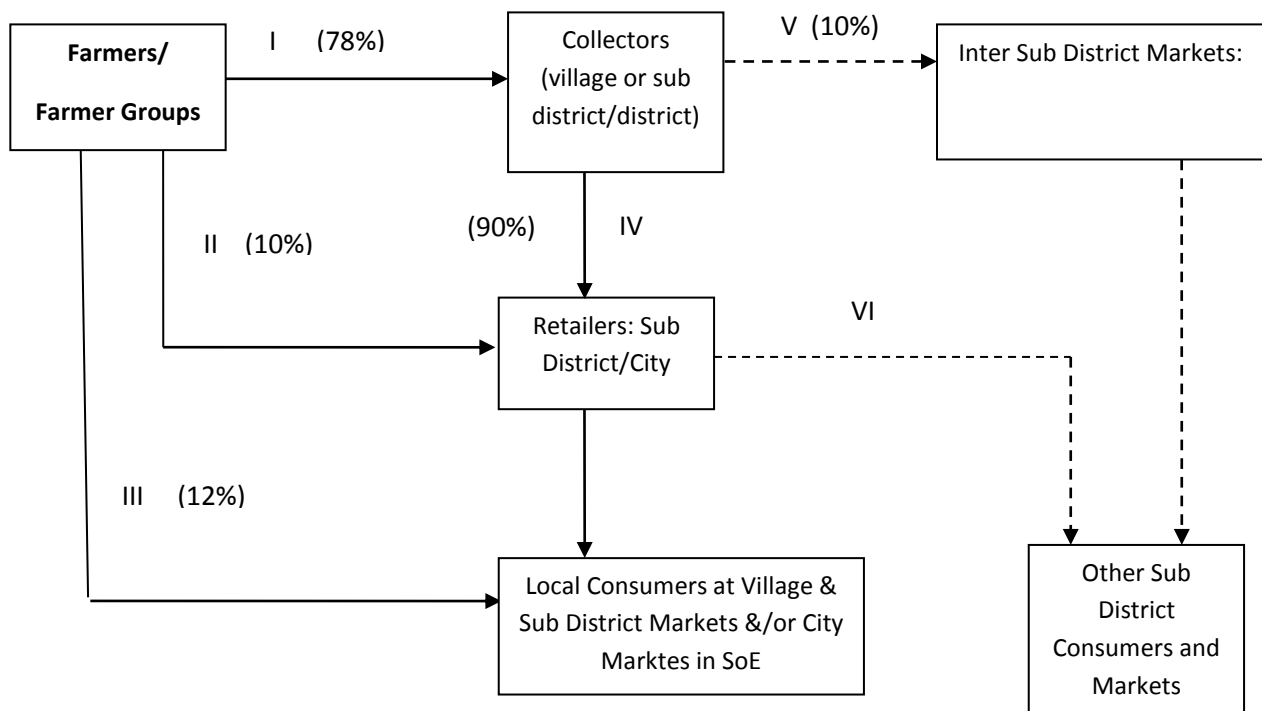
Thus, the best way to purchase maize in West Timor is located in local markets (weekly sub district markets, close to farm gate prices) at farmers as retailers. This way will benefit more to farmers. At this stage, price of maize is lower than at collectors or retailers at city markets. However, maize market volume selling by farmers is smaller than at collectors' ones.



**Figure 6.2. Maize Market Linkages in Kupang District in West Timor**

Remarks:   
 ———→ : Regular maize and trader movement between markets (inter sub district or district markets during maize seasons)   
 - - - -> : Regular maize and trader movement between markets

In TTS district, respondent performance in marketing chains was shown in Figure 6.3. Most of farmers (78%) sold their crops to collectors, 12% to local consumers and other 10% to local retailers. Only 10% maize from farmer sold to inter sub district or district markets through collectors; while 90% sold to retailers at sub districts or city markets.

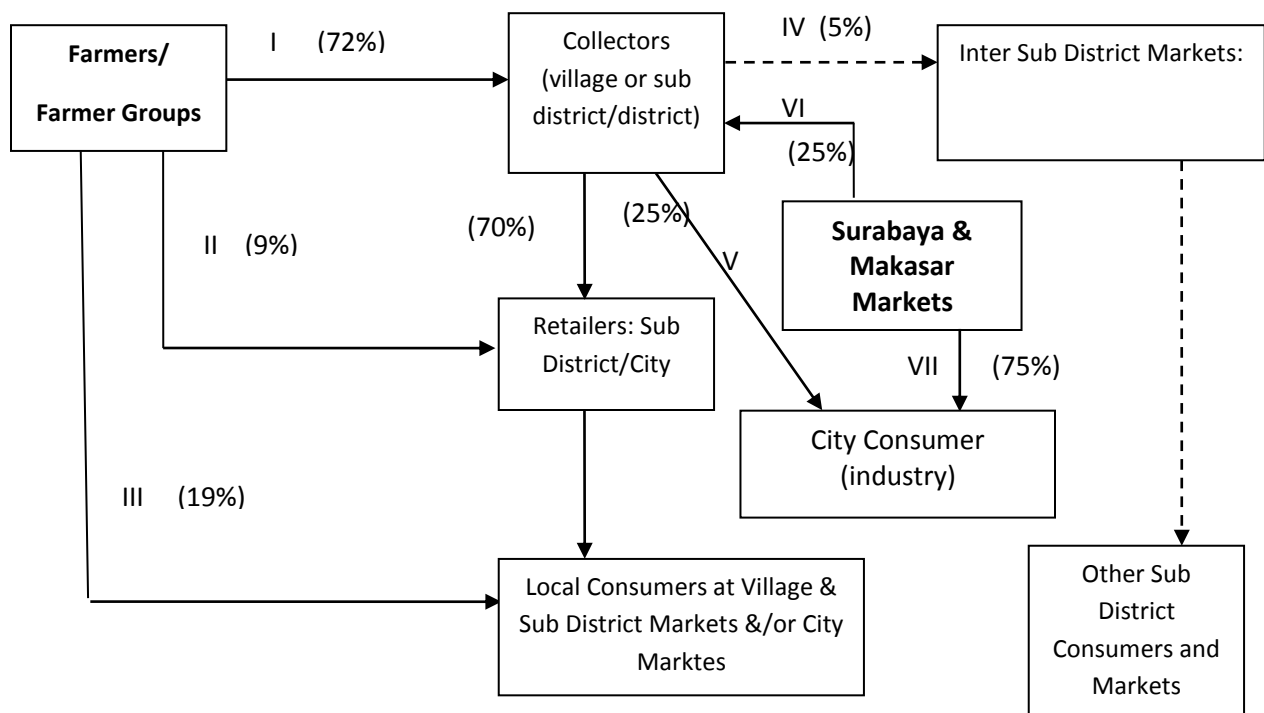


**Figure 6.3. Marketing Channels For Maize In TTS District, 2010**

- - - - -> : irregular market supply during season
- > : regular market supply during season
- % : Percentage maize volume distributed by marketing stakeholders interviewed
- Channel I : Farmer/Farmer group → Collector → Retailer → Local consumers
- Channel I I : Farmer/Farmer group → Retailer → Local consumers
- Channel III : Farmer/Farmer group → Local consumers
- Channel IV : Farmer/Farmer group → Collector →Retailer Markets → Local consumers
- Channel V : Farmer/Farmer group → Collector →Inter sub district markets → Other Sub District or District Consumers and Markets
- Channel VI : Farmer/Farmer group → Retailers → Other Sub Distric or District Consumers and Markets

Sorce: Survey Data Calculated, 2011.

Respondent performance in marketing chains in Kupang was shown in Figure 6.4. Most of farmers (72%) sold their crops to collector, 19% to local consumer and other 9% to local retailer. Only 5% maize from farmer sold to inter sub district or district markets through collector. And most of the collector (70%) sold the maize to local trader (retailers) in sub district markets or to city markets (Kupang). Collectors particularly inter-island traders also receive maize from Java or Makasar (25%). Livestock Industry as a consumer receive also maize from Java or Makasar (75%) or collector (25%). Thus, there two main sources (suppliers) for maize markets in West Timor that is Java/Makasar and local farmers.



**Figure 6.4. Marketing Channels For Maize In Kupang District, 2011.**

**Remark:**

- > : irregular market supply during season
- > : regular market supply during season
- % : Percentage maize volume distributed by marketing stakeholders interviewed

- Channel I : Farmer/Farmer group → Collector → Retailer → Local consumers
- Channel II : Farmer/Farmer group → Retailer → Local consumers
- Channel III : Farmer/Farmer group → Local consumers
- Channel IV : Farmer/Farmer group → Collector → Inter Sub District Markets → Other Sub District or District Consumers and Markets

- Channel V : Farmer/Farmer group → Collector → Industry  
 Channel VI : Surabaya or Makasar → Collector → District Markets → Other Sub District or District Consumers and Markets  
 Channel VII : Surabaya or Makasar → Industry

Source: Survey Data Calculated, 2011.

### 6.2.2. Supply and Demand Balance of Maize in TTS and Kupang Districts

Maize marketing volume in TTS and Kupang districts influenced by many factors. Factors, some of many, affecting marketing volume are production (supply), culture in terms of maize farm business orientation, demand (for seed, feed or consumption) and market structures (price and competitiveness).

Summary results of the analysis on supply and demand balance presented in Figure 6.5. Details of the results in order to know the availability of maize production in NTT by districts are presented in Tabel 6.2. data detailed is presented in Annex 6.1.

The Figure and Table showed that overall NTT province has surplus of maize compared to its demand. It is surplus 546 285 ton in 2010. Districts that have deficits in 2010 are kota Kupang, Sikka and Manggarai. TTS district is the greatest district of maize surplus in 2010 that is 102 296 ton. Kupang is the 3<sup>rd</sup> district of maize surplus in 2010.

Problems particularly for districts as production center areas (TTS, Belu and Kupang) dominantly (60-70%) do not sell maize to markets. Community in Southern part of TTS and Kupang only up to 40% of production of the year sell maize directly after harvest. Community of northern part of TTS only up to 15% of production sell maize to markets. Community has priority to keep maize at their home to maintain food security or other needs (seed, feed, social function, etc) during the year.

This habits have caused low supply of maize to markets, particularly for deficit districts. This has caused a big gap or maize price between centre and non centre of production, especially at no harvesting time. Inter-island traders in Kupang buy maize from Surabaya dan Sulawesi is due to lack of maize supply to markets in West Timor. For example, PT Unggas Nusa Timor in Kupang buy maize from outised West Timor is up to 70% each year, to cover all his needs about 1500 ton per year. Local maize from west Timor is small in size and low water content which are not suitable for chicken feed (pers.com with the Director of PT Unggas Nusa Timor dan UD Bentari Kupang, 2<sup>nd</sup> week of Januari 2011 in Kupang).

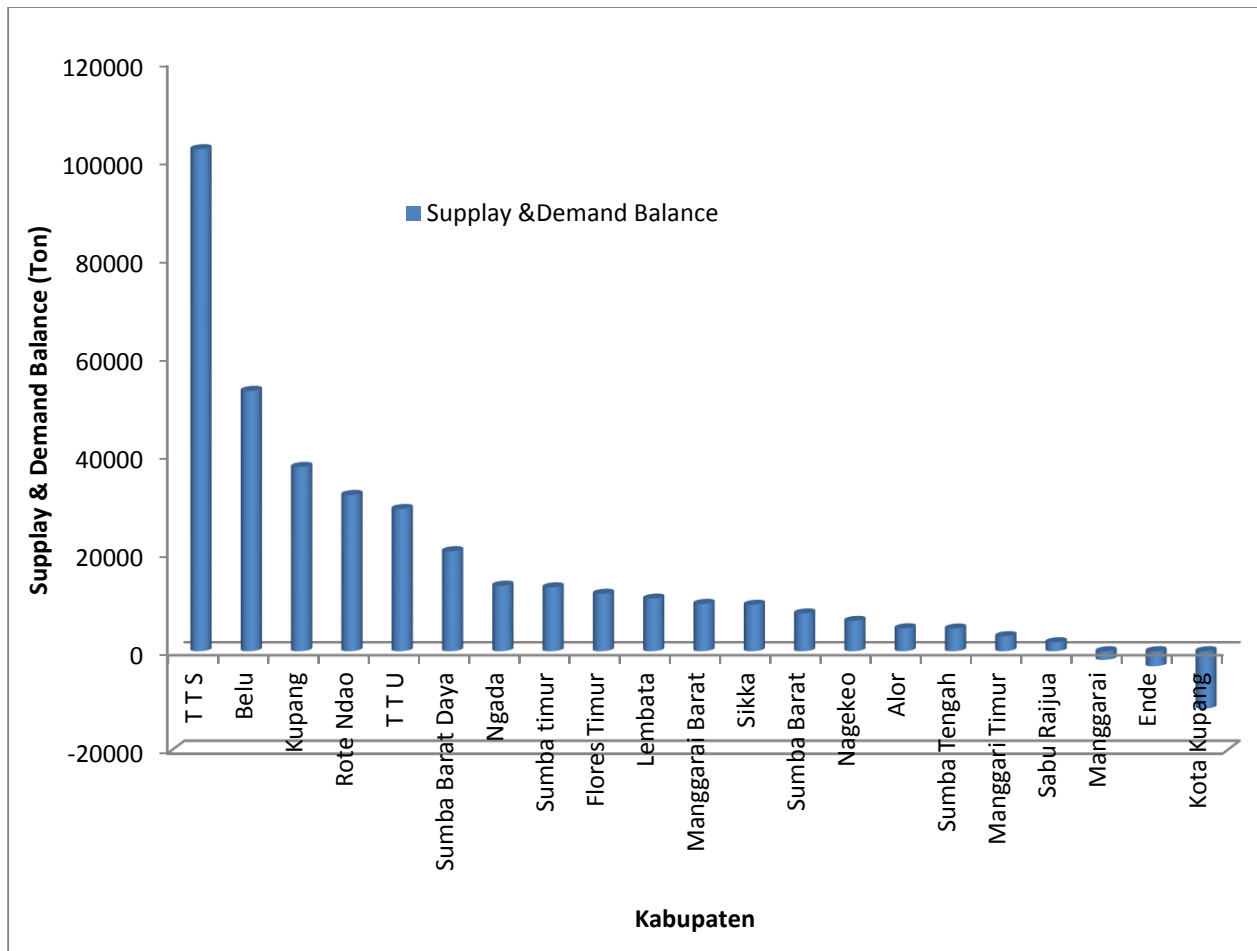


Figure 6.5. Supply and Demand Balance for Maize in NTT, 2010 (from the greatest to the smallest balance needs)

Source: Recalculation from Table 6.2.

Tabel 6.2. Maize Supply and Demand Balance by Districts in ENT Province, 2010

No	District	Population (mid 2009) (people)	Planting Area (Ha)	Harvested Area (Ha)	Production dry grain (Ton)	Needs for (Ton)*			Production Availability dry grain (Ton)	Production Equivalent Rice (Ton)	Consumption Needs Equivalent Rice (Ton)	Surplus (+) or Deficit (-) (Ton)
						Seed	spilled out	Feed				
1	Kota Kupang	299518	497	384	999	10	50	60	879	838	12,507	(-11,669)
2	<b>Kupang</b>	<b>394173</b>	<b>29,742</b>	<b>23,362</b>	<b>64,294</b>	<b>607</b>	<b>3,215</b>	<b>3,858</b>	<b>56,615</b>	<b>53,982</b>	<b>16,459</b>	<b>37,523</b>
3	Rote Ndao	115874	15,003	13,582	43,537	306	2,177	2,612	38,442	36,654	4,838	31,816
4	Sabu Raijua		643	513	2,159	13	108	130	1,908	1,820	-	1,820
5	<b>T T S</b>	<b>419984</b>	<b>56,345</b>	<b>54,672</b>	<b>142,502</b>	<b>1,149</b>	<b>7,125</b>	<b>8,550</b>	<b>125,677</b>	<b>119,833</b>	<b>17,537</b>	<b>102,296</b>
6	T T U	214842	20,410	16,791	45,157	416	2,258	2,709	39,773	37,924	8,971	28,953
7	Belu	465933	41,014	33,820	86,361	837	4,318	5,182	76,025	72,489	19,455	53,034
8	Alor	181913	7,023	5,666	14,589	143	729	875	12,841	12,244	7,596	4,648
9	Lembata	108152	8,661	7,093	18,108	177	905	1,086	15,939	15,198	4,516	10,682
10	Flores Timur	238166	12,669	10,331	25,764	258	1,288	1,546	22,672	21,617	9,945	11,672
11	Sikka	279464	11,920	9,682	25,139	243	1,257	1,508	22,131	21,101	11,669	9,432
12	Ende	238195	3,853	3,149	8,216	79	411	493	7,234	6,897	9,946	(-3,049)
13	Ngada	135294	10,415	8,445	22,588	212	1,129	1,355	19,891	18,966	5,649	13,317
14	Nagekeo	126761	6,131	5,037	13,638	125	682	818	12,013	11,454	5,293	6,161
15	Manggarai	274984	5,392	4,394	11,582	110	579	695	10,198	9,724	11,482	(-1,758)
16	Manggarai Barat	211614	9,867	8,103	21,969	201	1,098	1,318	19,351	18,451	8,836	9,615
17	Manggari Timur	244798	7,046	5,764	15,793	144	790	948	13,912	13,265	10,222	3,043
18	Sumba timur	233568	12,653	10,353	27,067	258	1,353	1,624	23,832	22,723	9,753	12,970
19	Sumba Tengah	61370	3,981	3,203	8,539	81	427	512	7,518	7,169	2,563	4,606
20	Sumba Barat	108644	6,588	5,341	14,532	134	727	872	12,799	12,204	4,537	7,667
21	Sumba Barat Daya	266408	17,087	13,932	37,470	349	1,874	2,248	33,000	31,465	11,124	20,341
	NTT		273,367	194,036	650,003	5,577	32,500	39,000	572,926	546,285	-	546,285

\*: Convert Eq rice : 95,35 %; spilled out : 5,00%; feed : 6,00 %; consumption : 41.756 KG Eq rice; seed : 20,4 Kg

\*: Standarisasi by Badan Bimas Ketahanan Pangan Provinsi Nusa Tenggara Timur, 2007-2010

Source: BPS NTT, 2010; Dinas Pertanian dan Perkebunan NTT 2010; dan Badan Bimas Ketahanan Pangan Provinsi Nusa Tenggara Timur, 2010

### 6.2.3. Maize Value Chain Prices and Margins in TTS and Kupang Districts

Farmers who sell their products directly to consumers gain higher price 50% than farmers who sell maize to collectors. For example, selling price at farmer level in July was Rp. 2.000,- per kg, while at retailer level is Rp. 3.000,-per kg (the same price for TTS and Kupang farmers). Farmers and collectors do not applied sorting, grading or labelling before their sell their products. Inter-island traders and bigger collectors do limited sorting to separate good and bad quality of maize only. There are no other treatmets to keep a good quality of maize produce.

At inter-island traders, chemicals to avoid pests and diseases (fungus) were applied in storage activity. Price differences between seasons (harvest and no harvest time) are high (Table 6.3, Figure 6.6 and Figure 6.7). To avoid this, inter-island traders and wholesalers only buy maize at April to August each year. At these time, price of maize is lower than other months during the year (pers.com with inter-island trader in Kupang, January 2011).

Storage facility in farmer and collector were very limited. They only used plastic bag and there were no special place, such as pile in warehouse. There were acceptable storage facility in wholesaler and inter island warehouse for maize and other crops. Limited storage facility in farmer house made them sold the crop quick right after harvest to avoid storage damages. The crop overwhelmed the interisland store and price went down in the harvest season.

**Tabel 6.3. Average Price of Maize at Different Marketing Entities<sup>1)</sup>**

Stakeholders	Price (Rp/Kg)					
	Atambua <sup>2)</sup>	Kefa <sup>2)</sup>	SoE <sup>2)</sup>	Kupang <sup>2)</sup>	Java, Makasar	Average
Farmer	1500	1500	2000	2200	na	1800
Collector	2000	2000	2300	2400	na	2000
Retailer	2500	2500	2650	2800	na	2425
Inter-island Trader*				2450	2450	2450

<sup>1)</sup> Average price for yellow maize during 2010; ranges from Rp.1500 per kg (at harvest season April – August) to Rp. 5000 per Kg at no harvesting time(Oct-Februari)

<sup>2)</sup> Atambua capital city of Belu, Kefa capital city of Timor Tengah Utara, SoE capital city of Timor Tengah Selatan, Kupang: capital city of Kupang dan NTT province. Price in Atambua and Kefa based on interview resulted from Retailers in SoE and Kupang city.

\* Kupang: UD Unggas Nusa Timor; Toko Timor, Toko Himalaya (price in Kupang)

TTS : Toko Komodo

na : not avilable

Source: Primary Data, 2011

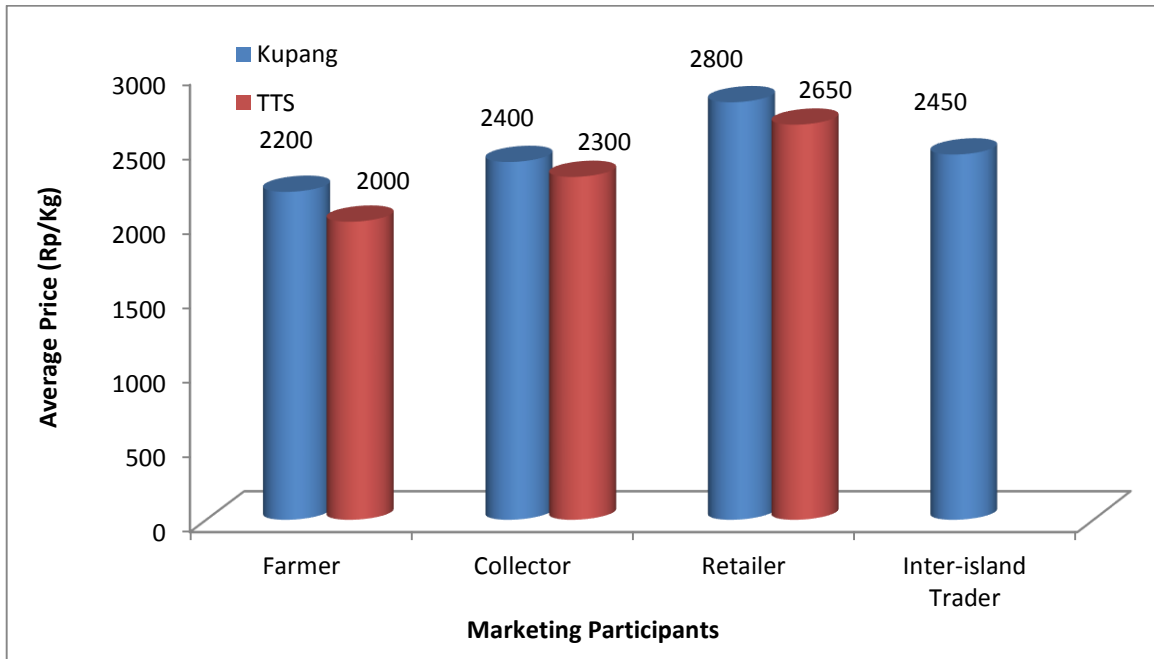


Figure 6.6. Average Price of Maize at Different Level of Marketing Participants in TTS and Kupang

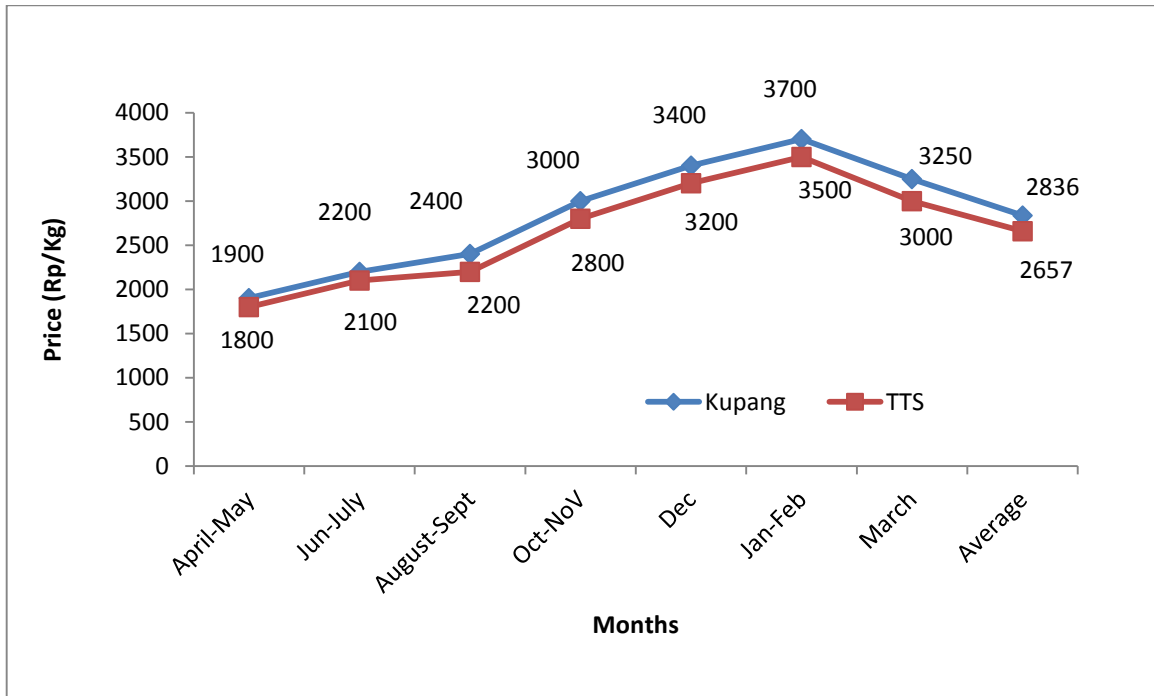


Figure 6.7. Average Retailer Market Price of Maize at Different time of Buying and Selling within a year of 2010 in TTS and Kupang

Source: Calculated from Survei Data, 2011.



The table above showed that average price in TTS and Kupang during 2010 is different between seasons (harvested and no harvested time). The difference is due to lack of maize supply. Supply and demand is the crucial point to form price of maize. When supply is less than demand at the same time, the price goes up; and vice versa. This condition is worsen when the transportation during Decemeber to February become a constraints for maize marketing process. At this time, land or sea transportation in TTS and Kupang is difficult to reach rural areas. Lack of supply of maize at this time caused high price. Lack of maize supply resulted in low consumption of maize, and then rural community choose to consume other agricultural products such as cassavas or bananas.

Based on maize differentiation prodcue, price of maize at various markets at the survey areas is also different (Table 6.4).

Table 6.4. Different Price Based on Different Produce<sup>1)</sup> in TTS and Kupang, 2011

Maize Types	Price (Rp/Kg)*	Noticed
1. Yellow local maize	4 000	kernel
2. White maize	5 000	kernel
3. Glutinous maize	8 000	kernel
4. White dehulled maize (white)	9 000	Half way process
5. Maize grits (yellow)	10 000	Clean & ready to use/cook
6. Very fine maize grits (yellow)	4 000	Rough flower
7. Yellow maize grits	4 000	Size ¼ of whole kernel
8. Yellow maize grits	4 000	Size ½ of whole kernel
9. Introduced maize (bisma) yellow	5 000	kernel
10. Weevil infested maize	3 000	Feed for chicken and pig
11. Smoked maize	3 000	kernel
12. Maize bran	1 000	Feeding pig

1) : Average price at retailer markets in SoE and Kupang in the second week of January 2011.

\* : Price (Rp/Kg) in SoE (TTS) and Kupang is the same at retailer market level in the second week of January 2011.

Source: Calculated from Primary Data, 2011.

The following figures (Figure 6.8) show different types of maize products sold in selected markets in TTS and Kupang.

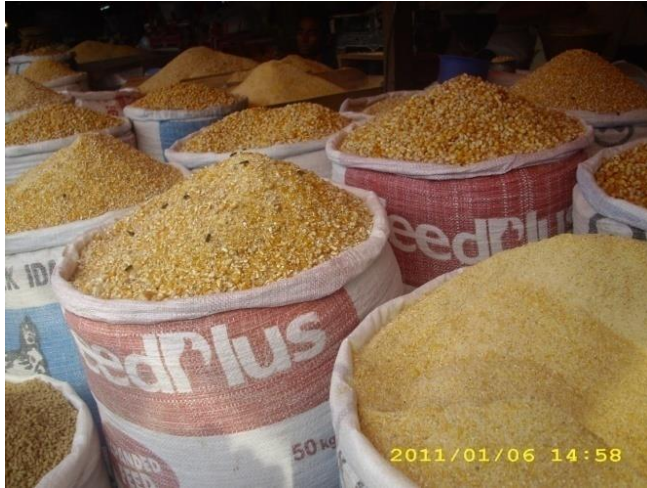
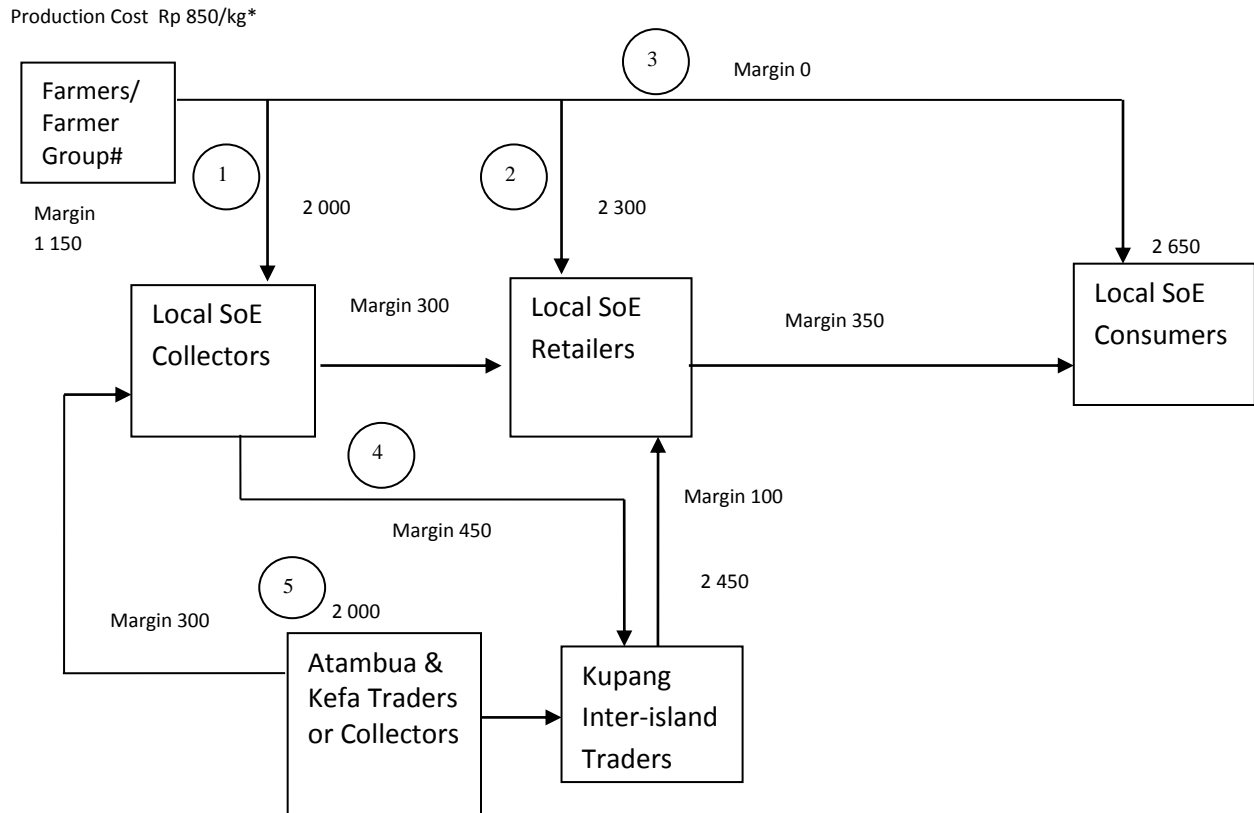


Figure 6.8. Different Types of Maize Products Sold in Selected Markets in TTS and Kupang, January 2011.

Interview with retailers in SoE and Kupang markets showed that maximum price of maize (it is about Rp. 6500 per kg for yellow Maize kernel) will be occurred in February this year. Thus, the price of produce in the table above is expected to increase in February this year. Retailers forecast that price this year will increase about 20-30% compared to the year before. This due to heavy rain in the production centre that caused low production of maize.

The following figures (Figure 6.9 and 6.10) show market price and margin at different marketing channel of maize (based on production cost in 2010) in TTS and Kupang districts. In TTS district, farmers gained greater margin (Rp. 650 per kg) if they sell their maize to retailer than to others. However, only few farmers (10%) follow this channel. In Kupang district, farmers as producers have greater margin (Rp. 600 per kg) if they sell their produce to retailers)

or if they sell maize to consumers than to collectors. However, only few farmers (19%) follow this marketing channel.



**Figure 6.9. Value Chain Prices and Margin (Price Received Rp/kg and Margin per kg) in TTS District**

Remark: \* :Maize farm cost-return analysis from Distanbun Provinsi NTT, 2010.

? : data not available (it does not a survey focused)

# : detailed list of farmer groups are presented in Annex 6.2.

⊙ : maize marketing channels

Channel 1 : Farmer/Farmer group → Collector → Retailer → Local consumers

Channel 2 : Farmer/Farmer group → Retailer → Local consumers

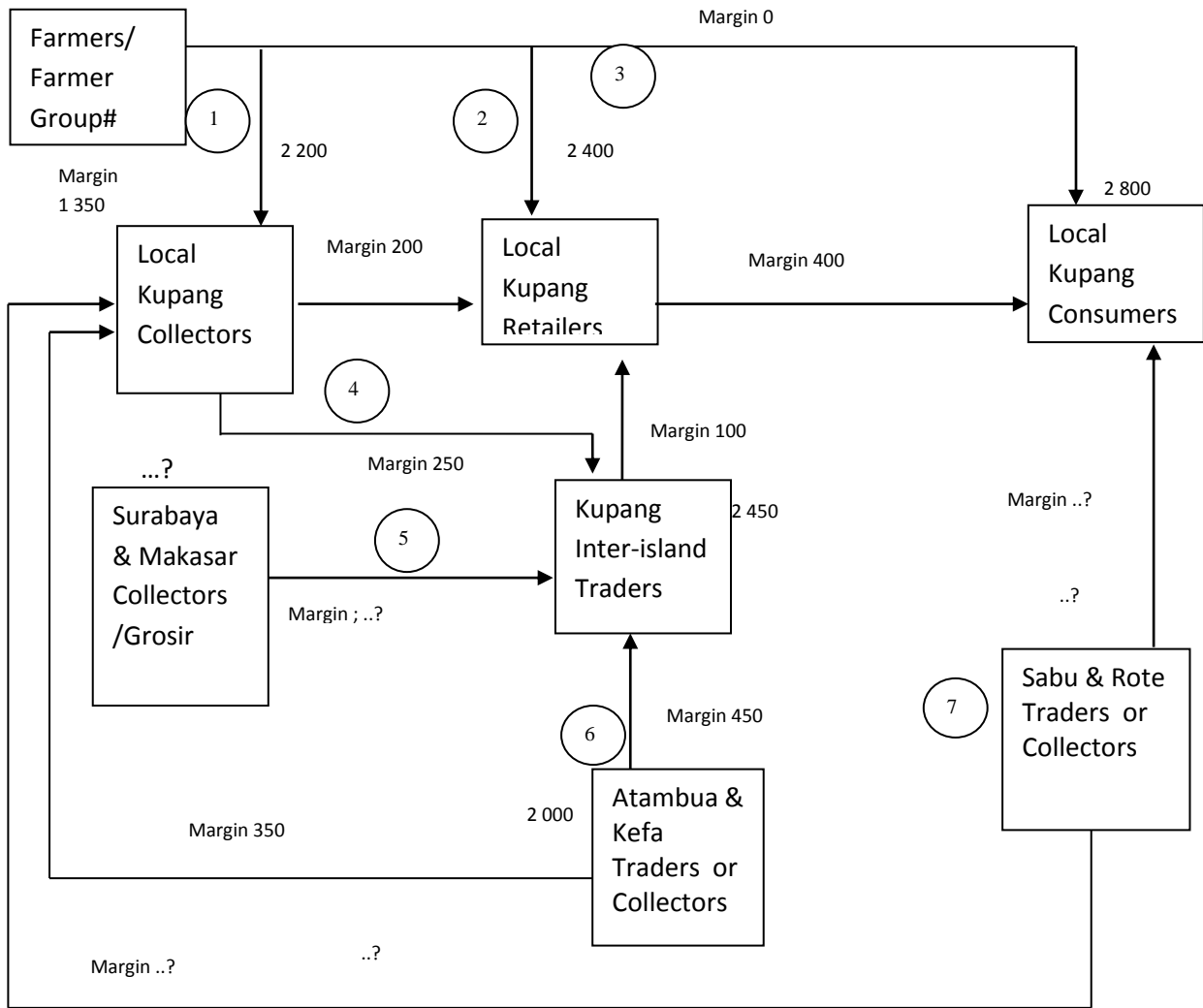
Channel 3 : Farmer/Farmer group → Local consumers

Channel 4 : Farmer/Farmer group → Collector → Inter-island trader → Local consumers

Channel 5 : Atambua/Kefa Trader/collector → TTS Collector → Inter sub district markets → Other Sub District or District Consumers and Markets or to inter island traders in Kupang city

Source: Primary Data, 2011

Production Cost Rp 850/kg\*



**Figure 6.10. Value Chain Prices and Margin (Price Received Rp/kg and margin per kg) in Kupang District**

Remark: \* : Maize farm cost-return analysis from Distanbun Provinsi NTT, 2010.

? : data not available (it does not a survey focused)

# : detailed list of farmer groups are presented in Annex 6.2.

○ : maize marketing channels

Channel 1 : Farmer/Farmer group → Collector → Retailer → Local consumers

Channel 2 : Farmer/Farmer group → Retailer → Local consumers

Channel 3 : Farmer/Farmer group → Local consumers

Channel 4 : Farmer/Farmer group → Collector → Other Sub Distric or District Consumers and Markets through inter island traders

Channel 5 : Surabaya/Makasar collectors → inter island traders → other markets

Channel 6 : Atambua/Kefa traders → inter island traders or to local Kupang collectors

Channel 7 : Sabu/Rote traders → local Kupang consumers or to local Kupang collectors

Source: Primary Data, 2011

Both districts, farmers prefer to choose collectors because of sustainability in their long and closed relationship with collectors. In the economic crises situation, particularly at the time of no harvested produce, farmers often sell their produce before harvesting time (forward sale) to collectors that they know well. Direct selling to collector is no cost to farmers that always buy their maize at farm gate point. Collectors who buy their maize at this channel are those who stay closed to them at their village or sub district.

Based on marketing margin analysis, the best way to purchase maize in West Timor is located in local markets (weekly sub district markets, close to farm gate prices) at farmers as retailers. This way will benefit more to farmers. At this stage, price of maize is lower than at collectors or retailers at city markets. However, maize market volume selling by farmers is smaller than at collectors' ones. It is suggest that farmer groups that have already exist at the study areas are also the better way to maize in the future (Lists names of farmer groups according their location are presented in the Annex 6.2).

### **6.3. Maize Marketing Efficiency in Kupang and TTS Districts**

#### **6.3.1. Cost, Price and Marketing Efficiency Level of Maize**

Marketing efficiency is a ratio between marketing costs with selling price. Marketing efficiency used to measure marketing process on particular commodity. Measurement result on several marketing entities involved in maize marketing in 2010 was highlighted below.

From Table 6.5 shows maize selling price in every marketing entities very different. This difference reflected a marketing pattern which was playing significant role on price determination. It was related with cost which was spent by every player. The longer marketing channel was passed through by a commodity, there would be more cost. Increasing selling price was the only way to recover marketing cost. High marketing cost was caused from the distance one marketing entities to reach the other for crop exchange.

Marketing cost in this study are transportation and packaging costs. Joint costs such as labour and other operational costs do not count. It closely related to mixture selling products by marketing stakeholders. One marketing palyer sell many products at the same market.

Study result shows in 2010 maize price had increased significantly compared to years before. It was high maize demand in 2010. There was a probability in increasing costumer

preference on this product. Along with government program in maize development in production center, customer awareness increased. One of East Nusa Tenggara provincial government's commodity development priorities since 2008 was food crops, include maize and livestock (Sehati Sesuara Membangun NTT Baru, Laporan Tahunan Tahun 2009). Based on followed marketing channel, distance from producer to consumer, length of marketing chain and price determination system, which was done by the farmer, some indicator of marketing efficiency was showed in Table 6.5 and 6.6 in Kupang and TTS districts, respectively.

**Tabel 6.5. Average Selling Price, Margin, Farmer share, Profit dan R/C ratio of Maize Marketed at different level of marketing entities\* in Kupang District in 2010.**

Marketing Channel	Price (Rp/Kg)				Farmer Share (%)	Profit Rp/Kg	R/C ratio
	Farmer	Collector	Retailer	Margin			
I	2200	2400	2800	600	78.6	250	0.7
II	2400		2800	400	85.7	150	0.6
III	2800			0	100.0	1800	12.0
IV	2200	2400		200	91.5	0	0.0

\* : Only for channel that involving farmer directly (12 responden farmers).

Channel I : Farmer/Farmer group → Collector → Retailer → Local consumers

Channel II : Farmer/Farmer group → Retailer → Local consumers

Channel III : Farmer/Farmer group → Local consumers

Channel IV : Farmer/Farmer group → Collector → Other Sub Distric or District Consumers and Markets Markets through inter island traders

Source: Primary Data, 2011.

**Tabel 6.6. Average Selling Price, Margin, Farmer share, Profit dan R/C ratio of Maize Marketed at different level of marketing entities\* in TTS District in 2010.**

Marketing Channel	Price (Rp/Kg)				Farmer Share (%)	Profit Rp/Kg	R/C ratio
	Farmer	Collector	Retailer	Margin			
I	2000	2300	2650	650	76.8	300	0.9
II	2300		2650	350	87.5	100	0.4
III	2650			0	100.0	1650	11.0
IV	2000	2300		300	87.2	100	0.5

\* : Only for channel that involving farmer directly (12 responden farmers).

Channel I : Farmer/Farmer group → Collector → Retailer → Local consumers

Channel II : Farmer/Farmer group → Retailer → Local consumers

- Channel III : Farmer/Farmer group → Local consumers  
 Channel IV : Farmer/Farmer group → Collector → Other Sub Distric or District Consumers and Markets

Source: Primary Data, 2011.

From calculated farmers share, marketing profit, return to cost ratio and efficiency value, 3<sup>rd</sup> channel was most efficient channel. The more high farmers share absolute value and return to cast ratio value, the more efficient the marketing channel pattern was. In channel 3<sup>rd</sup>, farmers get IDR 12 for every IDR 1 spending in maize marketing activity in Kupang and IDR 11 in TTS district. The more low absolute marketing cost efficiency value, the more high marketing efficiency in the marketing channel. Table 6.7 and 6.8 and Figure 6.11 show there was highest efficiency level for maize marketing in channel 3<sup>rd</sup> in both districts. It reflected that marketing efficiency using this channel more efficient compared to other channels.

**Tabel 6.7. Maize Marketing Efficiency Level in Kupang District**

Marketing Channel	Cost (*) Rp/kg	Price Rp/kg	Efficiency %	Margin (Rp/kg)
I	350	2200	15.91	600
II	250	2400	10.42	400
III	150	2800	5.36	0
IV	200	2200	9.09	200

(\*) marketing cost consists of transportation and packaging costs. Cases from 12 farmer respondents in Camplong and Baun in Kupang district; and Naikoten Market in Kupang city.

- Channel I : Farmer/Farmer group → Collector → Retailer → Local consumers  
 Channel II : Farmer/Farmer group → Retailer → Local consumers  
 Channel III : Farmer/Farmer group → Local consumers  
 Channel IV : Farmer/Farmer group → Collector → Other Sub Distric or District Consumers and Markets Markets through inter island traders

Source: Primary Data, 2011.

**Tabel 6.8. Maize Marketing Efficiency Level in TTS District**

Marketing Channel	Cost (*) Rp/kg	Price Rp/kg	Efficiency %	Margin (Rp/kg)
I	350	2000	17.50	650
II	250	2300	10.87	350
III	150	2650	5.66	0
IV	200	2000	10.00	300

(\*) Marketing cost consists of transportation and packaging costs. Cases from 12 farmer respondents in Kapan, Niki-Niki and Panite markets in TTS

Channel I : Farmer/Farmer group → Collector → Retailer → Local consumers

Channel II : Farmer/Farmer group → Retailer → Local consumers

Channel III : Farmer/Farmer group → Local consumers

Channel IV : Farmer/Farmer group → Collector → Other Sub Distric or District Consumers and Markets

Source: Primary Data, 2011.

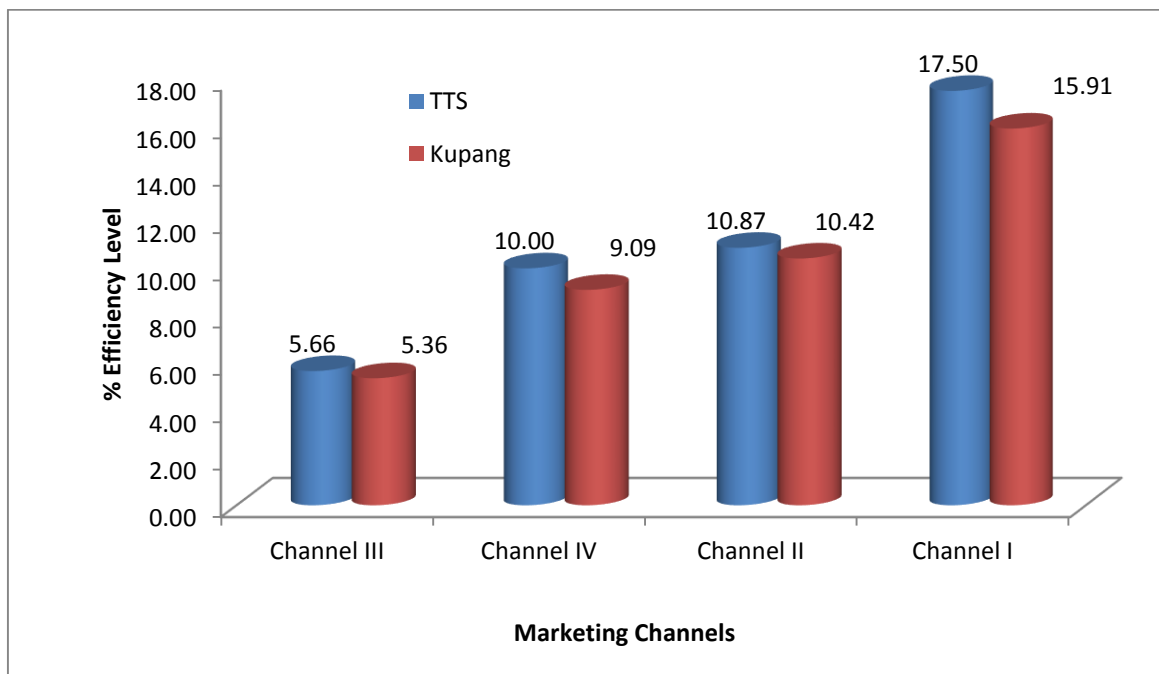


Figure 6.11. Maize Marketing Efficiency Level in TTS and Kupang Districts

Source: Primary Data, 2011.



From the Table 6.7 and 6.8 we know that the highest marketing margin was earned from 1<sup>st</sup> marketing channel which was IDR 600 per kg in Kupang and IDR 650 in TTS. This figures show there were big difference on cash amount received by farmer and end user paid cash. And smallest marketing margin was in 3<sup>rd</sup> channel. Based on this indicator 3<sup>rd</sup> channel was the most efficient marketing channel in maize value chain in TTS and Kupang districts in 2010. Based on efficiency value, the 3<sup>rd</sup> channel is the most efficient one. The smallest value of efficiency, the most efficient the marketing channel is. For Channel 1, if we increase price by 1%, the marketing cost will be increased by 18% in TTS and by 16% in Kupang. For this case, Kupang farmers have higher marketing efficiency level than TTS. The same efficiency trend were occurred for all other marketing channels.

It was important to be considered in 3<sup>rd</sup> channel which was very simple with out involving complex other entities. It was direct selling from producer to consumer. Considered factor was farmers are limited on working capital (human resources and cash), which were essential to reach broad marketing area such as consumer in other islands. Study result shows, only few maize farmers take place in 3<sup>rd</sup> marketing channel. Farmers go to markets with more than one purpose, namely to sell maize, peanuts or livestock. Farmers aim to market is to sell their products and also directly buy their daily needs such as food and fuel or clothes.

### **6.3.2. Influencing Factors in Maize Marketing Efficiency in TTS and Kupang Districts**

Maize marketing efficiency level was influenced by several factors such as selling price, marketing cost, the length of marketing channel, producer-collector-retailer relationship.

#### **a. Selling Price**

A comparison between farm gate price and end user price reflect gained profit by farmer. The smaller gap on that price, the higher farmer's share. It means producer had more motivation to produce more good quality crop.

In the study areas the main factor that caused big gap between farm gate price and consumer price was high transportation cost and limited in post harvest technology. Production center area where the study conducted was a hilly and mountainous area which obstructed commodity traffic and caused higher transportation cost. Improvement on

transportations facility and post harvest technology would increase farmer's share and marketing efficiency then.

Maize selling price is related to farmer income level. The higher the farm gate price, the higher the farmer income; *ceteris paribus*. Higher income motivated farmers to use more modern inputs (high quality seeds, fertilizer and other inputs) in maize production. Assumed, farmer had already aware on the inputs importance.

#### **b. Marketing Cost**

There a big influence from marketing cost on marketing efficiency. It closely related to maize selling price. The higher marketing cost caused higher selling price to end user. This condition made higher absolute efficiency value, which mean more inefficient marketing activity.

Marketing activity in study areas was seasonal marketing activity. Producer, as well as collector transported the crop using public transport to local market or district market or provincial market. Motor vessel or iron boat were used to transport maize to other island. Low transportation infrastructure in the area caused high cost to move the crops to other area. It influenced directly to marketing efficiency.

#### **c. The Length of Marketing Channel**

The length of marketing channel was depended on number of marketing entities involved in. The lessen marketing entities involved in the marketing channel, the shorter the channel could be and the more efficient the channel was. The efficient marketing channel was shown with minimum price gap between farm gate price received by producer and price which was end user have to pay. It was understood that every entities involved had expenditure and risks to cover up, as well as reasonable profit to take. Poor infrastructure and low post harvest technology drove to various losses in marketing channel.

#### **d. Farmer and Trader Relationship**

This variable was closed related with which marketing channel will be chosen by producer. Study shows that 60% of the producer can identified to know them quite well their

buyer. It was surprising since the trader lived and works in the same village. For that reason most of producer (72%) had chosen 1<sup>st</sup> marketing channel which was inefficient.

The study shows that most of producer (80%) relied to the collector to come and buy their crops. Producer did not actively deliver the crop to market or trader warehouse. High transportation cost and speculative market in market made producer reluctant to sell the crop by them self. In this way producer relatively to be price taker who followed coming trader/collector offered price. Collector and/or trader acted as market channel manager. In the other hand, trader used farmer's sudden cash need to occupy the crops by gave the farmer loan as crop down payment (forward sale), even the crop remain green ("ijon" system). Both producers' condition made the trader on the superior position to push down the farm gate price. Farmer's share value in this situation was low, then, which mean inefficient market channel.

Farmer interview concluded that key information, such as technology and market, were relatively rare obtained from stakeholders. That information circulated as mouth to mouth information in village or village market. Similar information for verification was almost none to explore.

#### **6.4. Consumer Preferences**

Maize was a preferred food crop to consume in all social level. Easy to cook in various ways and serve with reasonable price, imperishable in such long time, and nutritious made this food delighted to consume.

Maize was a medium economical value and well known in East Nusa Tenggara Timur as well Indonesia. As explained above there are some varieties of maize in the study areas, that is, yellow, white, dehulled, etc (all local maize), and also introduced variety from Java or Sulawesi. Based on processed produce, there are some products such as very fine grits, medium grits, dehulled and flake Maize.

Quality, particularly cleanliness and grades is the main factor to be noticed. Consumers preffer to get stablised price and supply in a whole year markets. Price fluctuation between harvested and non harvested time is very high. The same harvested time for all regions in TTS and Kupang do not give more benefit to farmers. High fluctuation of price and Maize supply also caused by the limitation of storage facilities at farmer level.

## 6.5. Maize Marketing Strategy in Kupang and TTS Districts

McCull-kennedy Kiel (1999) defined, marketing strategy is a tool or method to use coordinated and planned marketing resources such as product, price, promotion, place and people, to achieve marketing agreed objective in marketing organization. Other wise Burns Alvin C & Ronald D.F. Bush (2000) defined, marketing strategy a selection of target market, captive market and marketing mix (product/service, price, distribution/place, promotion) which was needed to meet target market need and requirement. In this study, discussion focused on strategy and method that farmers used to sell their maize produce.

Marketing strategy practiced by maize farmers in the study areas shown in Table 6.9. Farmer skills and knowledge in maize production and marketing strategies is very low. Low marketing technology and strategy skills have caused maize market just around production center. This condition worsen by low land productivity, while market demand is high. As a result, local maize price is higher than maize price from other areas, such as Java and Sulawesi.

**Table 6.9. Marketing Strategies\* of Maize and Viable Solution Design**

Strategy	Existed practice	Viable solution Design
Product	Limited quality in packaging, grading and labeling/branding	<ul style="list-style-type: none"> <li>• Labeled packaging</li> <li>• Grading based on seed size and variety</li> <li>• Non chemical product</li> <li>• Appropriate post harvest technology</li> <li>• Appropriate product handling pre-sales and during sales.</li> </ul>
Price	<ul style="list-style-type: none"> <li>• Price determination dominated by trader who followed market price</li> <li>• Forward sales method price have different price with per kg sales at harvest date</li> <li>• Non existence of Marketing group or industry partnership</li> </ul>	<ul style="list-style-type: none"> <li>• Market price competed in several grades</li> <li>• Establish marketing group among producers with a partnership with traders</li> </ul>

**Tabel 6.9. Continued**

Promotion	<ul style="list-style-type: none"> <li>• Limited direct selling and promotion (exhibition)</li> <li>• Non existence of market information and partnership</li> </ul>	<ul style="list-style-type: none"> <li>• Labeled product</li> <li>• Advertise</li> <li>• Exhibition</li> <li>• Industry forum</li> <li>• Seminar/workshop</li> </ul>
Distribution	<ul style="list-style-type: none"> <li>• Farmers have not special selling stand at wet market</li> <li>• Local marketing orientation</li> <li>• Transport: public and ships</li> </ul>	<ul style="list-style-type: none"> <li>• Rent a special selling stand at market</li> <li>• Java market and export orientation</li> <li>• Partnership with service transportation to Java and Bali</li> </ul>
Stakeholders	Farmers and trader have limited knowledge and skill on production technology, agro industry, and marketing.	Capacity building (training) and communication among stake holder in terms of production technology, quality and marketing of maize.

\* : all these strategies are the same for TTS and Kupang districts, due to the same marketing and participant characteristics and problems.

Source: Primary data, 2011.

## VII. POTENTIAL AND KEY ISSUES OF MAIZE INDUSTRY

### 7.1. Maize Industry Potential

- Vast dry land area for maize farming in the study areas suitable for maize growth.
- Farmers cultivated maize traditionally and for many years with monoculture or rotated system. Compare to other commodity such as peanut and paddy, farmer's income from maize was competitive
- Classified as food crops, maize was very suitable commodity to cultivate with rotated method with peanuts, with positive side effect in increased soil fertility.
- Farmer's income could be improved through increment in productivity, crop quality and marketing system
- Local maize which dominated with small size particularly white color was met with consumer preferences.
- Since 2008, Local Government of East Nusa Tenggara Province seriously has been developing food crops, including maize as well as livestock for lead commodities in East Nusa Tenggara in 2008-2013.
- Production and market efficiency of maize should be got more attention in farmer capacity building done by government, NGO or research institution.
- In 2010, a big gap between actual production and potential production level
- East Nusa Tenggara is in 7<sup>th</sup> position in production volume among other province in Indonesia, has greater to be beat position in national level maize production.

### 7.2. Key Maize Industry Issues

#### a. Lack of Knowledge and Skills in Production technologies and Marketing Strategies.

Farmer's weaknesses such as disability to purchase modern farming input, limited farming knowledge and skill in production and post harvest technology, and marketing strategies; demotivated to improve every limitation and weakness, were general maize farmer condition in East Nusa Tenggara. Most of the producer limited in maize farming skill and limited to input access. Limited good agriculture practice information should be a factor occurred in maize farming, could be minimize with capacity building and strengthening farmers group,

as well as group marketing to have a better bargaining position in the market. Harvest and postharvest methods practiced by farmers are insufficient. Farmers are not knowing well about criteria of good quality of maize in terms of water content and maturity. Farmers also have a lack of knowledge in marketing information. Farmers only have partnership with local collectors and individual marketing. It is a need to form a good marketing group in maize in the study areas.

#### **b. Traders are better positioned in making deals with farmers**

Traders, mainly from capital sub district or district cities, usually make their initial decision on when to buy maize on the basis of maize prices at the retailers markets or wholesalers. Farmers have little knowledge about the city daily wet markets, let alone the markets in other places. Farmers were told that the markets in other markets or in cities were sluggish and if they didn't sell then with price they suggested, the prospect would be worse. Because there was little farm investment apart from labour, farmers generally would sell with any price suggested by traders. Farmers' bargaining position is weak. In most developing countries, farmers are perhaps the ones who have received least value from the chain, and traders, particularly wholesalers, are often the ones that are able to extract more value (Wei, et al., 2002). Even though, Traders have improper knowledge and skills in marketing and mainly on product quality, they have a better position in marketing of maize in NTT.

#### **c. Maize farmers care little about product quality**

Maize farmers in NTT generally lack the necessary knowledge and skills to maintain their harvested maize. Farmers get their return immediately after their product is paid by traders. Farmers did not care whether or not the traders make any profit. The traditional practices in harvesting, collecting and transporting caused low quality. Harvesting practices are very careless. Farmers often harvest maize mixture with the soils. There are no treatments after product harvested that potential attached by pest and diseases during storage. So, post-harvest handling treatments seem to be of no interest to farmers. Improved seed varieties should be tested and produced at the local level for distribution to local farmers. Thus, farmers can get good quality of seeds at the right time, place and volume. Using good quality of seeds can produce good quality of products.

#### **d. Packaging and grading is simple**

Packaging varies, but for many farmers who sell maize, often pack products using nylon bags or bamboo baskets to sell in village, district or provincial markets. Sometimes, at the markets, farmers grade the maize into some categories by looking at the size and varieties of the maize. Maize with bigger size and white varieties are first grade, second grade is medium or small in size and yellow varieties. At the traders' level, packaging and grading are also the same using nylon bags and simple grading systems as farmers did. Retailers, also, make some differentiation products by medium or small processors to product maize grits. However, the price of processed and unprocessed maize products are not different.

#### **e. Selling conditions are poor**

Farmers have a few avenues to sell their maize:

- ❖ To sell by themselves at the streets at any time
- ❖ To sell, by themselves or through traders, at the sub-district markets open once a week
- ❖ To sell, by themselves or through traders, at the district daily market in some cities in SoE and Kupang

In TTS and Kupang, these retail outlets' conditions are, also, poor. Products are often exposed to direct sunlight for days in the markets or a long streets, protected only by very simple materials such nylon bags, cartons or tree shadow or nothing at all.

#### **f. Lack of storage facilities**

There were limited storage facility in farmer's and trader warehouse. maize never is stored more than three weeks in farmer's level or retailer for market oriented, except for consumption or for seeds for the following year. Farmers stored maize only on "second floor" in their traditional house, without care about the water content. This type of storage induces maize lost up to 50% (pers. Com with Wayan Mudita, Researcher at Undana). Local maize which small in size and with low water content is not suitable for feeds (pers.com with PT Unggas Nusa Timor, 2<sup>nd</sup> week of January, 2011). Warehousing facility in interisland trader was provided but it remains under ideal condition. Improved storage facility could be an opportunity to manage supply and avoid overwhelmed market in harvest seasons. It was an opportunity for profit leverage more than 30%.



Treatment during storage only dealt with packaging with nylon bag (about 50 kg or 100 kg per bag) and other treatments to avoid mice pest and bacteria. With his kind of treatment, inter-island traders can store maize till next six months. It is about Rp. 300 per kg cost for those treatments, including hired labour cost. As a result, trader will get more profit outside harvesting time than farmers. If the price at harvesting time is Rp. 2000 per kg, it can be Rp.4000 per kg if there is no harvesting time or 50% higher than price at harvesting time. This condition create a big gap benefit between harvesting and no harvesting time of maize in the study areas or between farmers and big traders.

**g. Lack access to finance.**

Limited access to finance was making financial cost expensive. Farmer's depend on money lender for farming investment and made forward sale for loan settlement or immediate cash need. It was worsen in overwhelmed market when price went down. There was a need to investigate farmer's financial management and farming management to transform maize farming from subsistence farming to an agribusiness farming system.

## VIII. CONCLUSION AND RECOMMENDATION

Based on the survey that has been done in Kupang and TTS districts, there some points of conclusion as follows:

1. The highest production areas of maize in NTT are located in Timor Island with Timor Tengah Selatan District ranks the highest (22%), followed by Belu District (14 %), Kupang District (10%) and TTU District (8%).
2. The average maize productivity in Kupang District is about 2.4 ton per Ha with the productivity of each sub-district follows the same pattern as for the harvested area. Three dominant areas of production according to the number of maize productivity in Kupang District are Takari Sub-District (5 419 ton), Kupang tengah Sub-District (4 437 ton) and Amarasi Sub-District (4 298 ton)
3. As it has been mentioned in the previous conclusion, the productivity of maize production also follows the same pattern of as for the harvested area in TTS District with the average maize productivity is about 1.2 ton per Ha. Four dominant areas of production according to the number of maize productivity in TTS District are Amanuban Timur Sub-District (9 722 ton) followed by KiE Sub-District (9 368 ton), Molo Selatan Sub-District (8 047 ton) and Kot'olin Sub-District (8 210 ton) respectively.
4. In relation to cultivation practices of maize in all districts of Timor Island, weed infestation become one of the prominent factors that deter farmers from having planted large acreage of land for maize. Indeed the lateness of weeding also contribute much to decline of yield.
5. The agronomic, climatic and edaphic factors affecting the low production of maize in Timor are seed quality, weed infestation, availability water and rainfall and –pre and post harvest pest destruction.
6. There are two kinds of maize marketed and most probably consumed in TTS dan Kupang Districts based on kernel collors i.e. yellow and white maizes. Yellow maize is more preffered than white maize as the price of white maize is higher than that of yellow one.
7. Maize farming in TTS and Kupang Districts, mainly purposed for dailly consumption with only 30 % of total production for cash. Even though it was already market orientation, the farming remained using simple technology with minimum advance

farming input. Generally, Farmers sell maize at traditional weekly markets in sub district center.

8. Collectors or inter-island traders in Kupang and TTS, do not receive maize from Flores, Alor or Sumba islands, due to high transportation costs. However, some good quality of maize from Java and Makasar enter Kupang markets, through inter-island traders with the same price with local maize (Rp. 2450 per kg).
9. The best way to purchase maize in West Timor is located in local markets (weekly sub district markets, close to farm gate prices) at farmers as retailers. This way will benefit more to farmers. At this stage, price of maize is lower than at collectors or retailers at city markets. However, maize market volume selling by farmers is smaller than at collectors' ones.
10. There are two main sources (suppliers) for maize markets in West Timor that is Java/Makasar and local farmers. Most of local farmers (72%) sold their crops to collector, 19% to local consumer and other 9% to local retailer. Only 5% maize from farmer sold to inter sub district or district markets through collector. And most of the collector (70%) sold the maize to local trader (retailers) in sub district markets or to city markets (Kupang and TTS).

The recommendations highlighted below are the improvements should be implemented.

1. Demonstration plot for good agriculture practices should be conducted and spread out to maize production center in TTS and Kupang. Extension service improvement to disseminate local and national research study for productivity and farming efficiency improvement in order to produce a good quality of maize and its marketing efficiency is needed.
2. Improved marketing technology and strategies (packaging, labeling, grading, harvesting methods, supply marketing information, i.e. newspaper, radio, seminar, publications and calender; hiring stand point at wet markets, group marketing and networking) are some importing aspects for future improvements. Participative approach via training should be implemented to run those marketing and strategies. Success in marketing is a key motivation for farmers to improve maize land productivity. Participation of marketing complex participants with inter-island traders, exporters and government to improve production maize marketing will give a good prospects and satisfy consumers.

3. To avoid low price at harvesting time and losses in storage and to stabilize maize supply to markets during a year, improvement for storage facilities is needed. This followed by good treatment for post-harvest products that will have long life storage, without reduce volume and maize quality. Research in product life during marketing process and storage is future priority.
4. Investigate to establish maize farmer cooperative, under expert supervision, in helping farmers in:
  - Deliver service for special market, e.g. food industry or inter district markets or exports with special requirement.
  - Collective marketing for local or inter sub district or district or inter island trading, should improve farmers bargaining position.
  - As vehicle to deliver extension on production, harvest and post harvest handling (packaging, grading, sorting), maize promotion and collective marketing (group marketing).
  - Receive agribusiness (production and marketing) and financial management training.
  - Purchase input in bulk which could get more discounts.
  - Develop and establish micro finance institution to fulfill financial needs among farmers.
  - As farmer representative to build collaboration or partnership with other stakeholders.
5. Market uncertainty was a routine and general problem for maize producer in study areas. It needs to investigate possibility in building collaboration and networking between farmers and market outlet (food industry or traders) and financial institution as well. Some steps should be constructed such as:
  - Identification of farmer's community and farmers family who was eligible and suit to be members of partnership group associated to farmers cooperative.
  - Determination of approach pattern and group management.
  - Group need identification assessment.
  - Build partnership with inter-island trader and/or wholesaler trader as well as partnership with financial institution for financial resources; under expert supervision.
  - Build strong agreement on the partnership under the law with mutual and sustainable manner.

Networking concept also known as business partnership. Charles, C, et al., (1996) defined, business partnership is a process when stakeholder connected, involved and continued maintaining competitive profit from all similar entity, through available resources in trusted environment focused on sustainability and mutual improvement. Networking is a chart described connection in marketing activity of particular commodity start from production point and distribution and finished in end user or end consumer.

It was identified that maize marketing in the areas study involved various stakeholder from farmers, trader and government. Every party in every the link of the chain, called role occupant with its behavior is the target of policy. From identified stakeholders, farmers, and traders were role occupant in marketing organizing. And government as implementing agency could be provincial government, District (kabupaten or city) government or Agriculture service office in all level. These stakeholder involvements were spontaneous in particular commodity production season and were not continuous as long term working system.

In the link of chain level in marketing chain, trader acted as chain manager. Traders take most of price determination, quality determination, and market volume. In the other hand, farmer in their position and capacity as supplier has weak bargaining position. Farmers followed the trader managed chain. Trader's price determined without considering production cost rationale. Focus group discussion concluded that farmers could not influence market mechanism on their commodity. Beside that, farmers did not have any information access related to market system. There were many in farmer's level that were isolated from market information in the other area, information on central market, industry or information from where their crops ended.

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## **ANNEXES**