“The choice of a marketing channel to benefit corn producer’s welfare in Indonesia”

AUTHORS	Jusni Ambo Upe Andi Aswan

ARTICLE INFO	Jusni Ambo Upe and Andi Aswan (2021). The choice of a marketing channel to benefit corn producer’s welfare in Indonesia. *Innovative Marketing* , *17*(2), 45-57. doi:10.21511/im.17(2).2021.05
DOI	http://dx.doi.org/10.21511/im.17(2).2021.05
RELEASED ON	Wednesday, 05 May 2021
RECEIVED ON	Sunday, 14 March 2021
ACCEPTED ON	Monday, 26 April 2021

JOURNAL	"Innovative Marketing "
ISSN PRINT	1814-2427
ISSN ONLINE	1816-6326
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
68	0	7

BUSINESS PERSPECTIVES

LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine

www.businessperspectives.org

Jusni Ambo Upe (Indonesia), **Andi Aswan** (Indonesia)

THE CHOICE OF A MARKETING CHANNEL TO BENEFIT CORN PRODUCER'S WELFARE IN INDONESIA

Abstract

This study aims to examine the marketing channel optionsavailable for corn producers in South Sulawesi, the production center in Indonesia, as well as impact of such a choice on their income level. The target group was corn producers and corn traders. The total sample comprised 150 people, consisting of 120 corn producers and 30 corn intermediary traders within South Sulawesi Province. The results showed that three marketing channels accessed by producers are zero-level, one-level, and two-level channels. The net profit margin obtained by intermediary traders per kg is different by types for each marketing channel due to different marketing activities leading to different costs spent. The most efficient marketing channel is the zero-level channel that conducts direct selling to breeders. It followed by the one-level channel (from farmers to collectors and consumers). Finally, the two-level channel (from producers to merchant traders) showed the lowest efficiency. It should be mentioned that the zero-level channel offers a slight price increase for producers compared to other channels. Its consumers only buy limited number of products so that it does not have a wide impact on producer's welfare. The study also found high input costs spent to cultivate corn due to land rent, fertilizers, and pesticides.

Keywords corn producers, intermediary traders, margin, marketing efficiency, marketing channel

JEL Classification M31, Q12, Q130

Received on: 14th of March, 2021
Accepted on: 26th of April, 2021
Published on: 5th of May, 2021

Jusni Ambo Upe, Doctorate Degree, Department of Management, Economic and Business Faculty, Hasanuddin University, Indonesia. (Corresponding author)

Andi Aswan, Doctorate Degree, Department of Management, Economic and Business Faculty, Hasanuddin University, Indonesia.

Conflict of interest statement:
Author(s) reported no conflict of interest

INTRODUCTION

The agricultural sector is one of the prominent sectors contributing to economic development in Indonesia as this country is supported by abundant natural resources (Mahanty et al., 2017). The leading agricultural commodities, especially in South Sulawesi, are food crops, one of which is corn also known as Zea mays L that is the second most cultivated commodities after rice in the area (Suddin et al., 2020; Syaiful et al., 2020; Hatima et al., 2020; Jusni & Aswan, 2020; Taufik et al., 2015). This province, its districts at most, is said to be a centre of corn productionfor consumption and dominant inputs for animal food supply (Hatima et al., 2020; Tetik et al., 2019).

Although the province has sufficient soil fertility for growing corn, the welfare of corn producers in this area is inadequate (Hatima et al., 2020;Yuniarsih & Taufiq, 2020; Suprapti et al., 2016). Increased production and demand for any type of corn product is not followed by a proportional increase in farmer's income level (Suprapti et al., 2016). Many empirical works noted some factors that affect the welfare of corn producers (Gede & Nyoman Djinar, 2019; Sebayang et al., 2019). For example, the quality of corn depends on harvest and post-harvest handling (Fil'aini et al., 2020), land area, labor, farmer production

(Gede & Nyoman Djinar, 2019), government policies (Sebayang et al., 2019), seed quality (Wawo et al., 2020), the use of technology (Chavas & Nauges, 2020; Mariyono, 2019), and the policy of providing information (Liao et al., 2019).

In contrast to the abundance of existing literature, this study looks closely at the issue of farmer's welfare in relation to choose of marketing and distribution channel. It is noted that corn is one of the crops that is susceptible to quick damage. Hence, it requires a short and fast marketing, and distribution channel to maintain the quality (Frank et al., 2017; Mmbando et al., 2016; Davis et al., 2017). Long marketing and distribution channels and slow handling during each stage of the channel could cause a decline in quality, which in turn can affect the selling price (Paulsen et al., 2018; Osayi et al., 2018).

It is estimated that the study of corn producer welfare, even if any, is limited to a small area (Pratiwi & Canon, 2020), and based on the provincial level in Java at most (Nugroho, 2015; Widarma, 2019), which is not a corn production centre in Indonesia as designed by the central government (Sahro & Chen, 2021). Corn literature in the province, to the best of our knowledge, is only found at a district level (Suddin et al., 2020), and is focused on marketing matters regarding production or marketing costs spent by marketing and distribution channels. Accordingly, the study extends the existing literature by linking the matters of the efficiency of marketing and distribution channels and input costs, which could possibly affect the selling price at the corn producer level. These two matters together could cause a severe impact on producer's welfare (Dastagiri et al., 2012).

With respect to the importance of marketing distribution channels, it is noted that it could lower the prices at a producer level as given by these two reasons. First, a wide difference in each marketing channel for selling and buying price could encourage a price difference between producers and consumers. Secondly, it is also valid in a long marketing and distribution channel (Hadi & Hani, 2020). Even when there is a slight difference in selling and buying prices within each channel, but when marketing distribution involves a number of players, it causes a vast price difference between producers and consumers. These two reasons are also corroborated by the fact that farmers in each producing area might have a different relationship to the market, which then affects price response at a farmer level. This condition has been justified in some developing countries, including Mexico (Key et al., 2000).

Based on the above, the study looks closely to examine the efficiency of marketing and distribution channel that could strongly influence price determination at producer level. A vast price difference between producers and consumers is believed to be caused by an inefficient marketing and distribution channel accessed by producers, as well as high input costs spent by producers. To analyze deeply the efficiency, this study firstly is focused on assessing net revenue obtained by producers and at the same time analyzethe revenue level of intermediary tradersfor each marketing channel within the province. The results are then used to analyze the efficiency of corn movement in the marketing channel accessed by producers.

1. LITERATURE REVIEW

1.1. Corn farming business income

Corn cultivation also requires a calculation to maintain business continuity. There are two factors that affect farming – sales and expenses. Income or revenue, interchangeably used in this study, is obtained by a producer in a season, that is the result of multiplying the total number of products with the unit selling price. Expenses or costs are the value of the use of production facilities and others that are incurred in the production process.

These production costs are often referred to as operational costs. Production costs are costs that occur during production in each corn cultivation stage before sales. This stage includes corn seeds procurement, processing of planting site, preparation, weeding, planting, fertilizing, and harvesting (Rahayu et al., 2020; Hardesty & Leff, 2010). From the financial aspect, the production costs incurred

http://dx.doi.org/10.21511/im.17(2).2021.05

by farmers vary and can be grouped into variable and fixed costs (Gede & Nyoman Djinar, 2019). These two costs must be identified and calculated in the early stage before estimating the total production costs.

At the time of sale, this difference between total revenue and costs is known as profit (Mishra et al., 2012). It is the amount of money earned after deducting all production costs. If the sales obtained after deducted by production costs are positive, then a profit is obtained (Krismawati & Sugiono, 2020; Palobo, 2019), while a negative result means loss (Suddin et al., 2020).

1.2. Margin of intermediary traders

The movement of goods from producers to consumers requires efforts from marketing channels (Capstick & Capstick, 2019; Nalini & Rohaya, 2015). The marketing channel consists of intermediary trader(s). They are a collection of interrelated organizations (Gonzalez-Padron, 2017) to stream products from producers to consumers(Hardesty & Leff, 2010).

There are five kinds of marketing and distribution channels (Putri et al., 2018; Krafft et al., 2015). Zero-level channel involves producers and consumers only. One level channel involves producers, retailers, and consumers. The two-level channel comprises producers, wholesalers, retailers, and consumers, or it connects producers, agents, retailers, and consumers. Last, the three-level channel involves producers, agents, wholesalers, retailers, and consumers.

With respect to intermediary traders in agriculture commodities, marketing activities are applied at each level to move the commodity within a marketing channel (Hardesty & Leff, 2010). Each marketing activity requires costs to market the product, which are called marketing costs (Mounika, 2020; Hardesty & Leff, 2010). These marketing costs include transportation, loading, unloading, and stock costs (Onogwu et al., 2018; Hardesty & Leff, 2010). Elaborately, Suddin et al. (2020) classified marketing costs into transportation (personnel transportation, bag, and transportation), storage (warehouse), and process costs (drying, sorting, and shrinkage cost).

When costs spent are covered by selling price, traders gain income. It is the difference between the selling price paid by consumers and the costs spent for marketing activities (Hardesty & Leff, 2010).

1.3. Marketing efficiency

The concept of efficiency is simply measured by the output-input ratio (Sartina et al., 2021; Dastagiri et al., 2012). Similarly, efficient marketing is the ultimate goal to be achieved in the marketing system (Alderson, 2006; Gruen, 1997). A marketing process is said to be efficient if 1) output remains constant with less input; 2) output increases while the input used remains constant; 3) both output and input have an increase, but the rate of increase in output is faster than that of the input; and 4) output and input both experience a decrease, but the decline in output is slower than the input (Dastagiri, 2013; Beckman, 1940).

Marketing efficiency can be divided into technical efficiency (operational) and economic efficiency (price). Technical efficiency means physical control on the product and includes the following matters: procedure, technical, and the scale of the operation (Binam et al., 2004; Thiam et al., 2001). The objectives of physical savings include reducing waste, preventing a decline in product quality, and saving labor. For economic efficiency, marketing margin is used as a measuring tool (Scopel et al., 2013; Chavas & Aliber, 1993).

From various efficiency indicators, the farmer's share model of the price paid by a consumer is one of the most frequently used models (Suddin et al., 2020; Miedema, 1976). Farmer's share has a negative relationship with marketing margin, meaning that the higher the marketing margin, the lower the share received by farmers.

2. RESEARCH METHOD

2.1. Data collection technique and samples

There are two types of data used in this study: primary and secondary data. Primary data is obtained from corn producers and traders who carry out marketing and distribution activities towards consumers.

Secondary data is taken from literature, books, and company documents as well as from related agencies (Vartanian, 2011; Boslaugh & Boslaugh, 2009). This data is used to provide information on the quantity of e.g., corn producers, the number of distribution channels, the demand, production of corn, and other data deemed necessary.

The number of respondents was 150 people consisting of 120 corn producers and 30 intermediary traders. A number of respondents refers to Boyd (2013) and Kline (2014) who offered 100 as an absolute minimum number of respondents. The distribution of the respondents is 50 people per the Province.

2.2. Method of analysis

This study applied a quantitative approach, namely a two-stage calculation to come up with efficiency analysis. Firstly, the study calculates the total production costs, which are obtained by analyzing costs incurred by producers during the production process. To analyze deeply the revenue gained by producers, the production costs are identified, analyzed, and grouped into two categories, which are variable and fixed costs. Secondly, the study calculates marketing costs spent along with marketing and distribution channels. During this stage, the study identifies and analyzes corn movement along with marketing and distribution channels, at the same time identifying numbers of intermediary traders within it. The findings are analyzed to judge whether the distribution channel accessed by farmers are long or short. The study analyzed the margin gained by each intermediary trader and calculated the marketing costs spent by each of them. Furthermore, marketing efficiency (EP) is calculated based on the total marketing costs divided by the value of marketed corn products. The smaller the EP value, the more efficient the marketing chain is. A detailed formula for each calculation is elaborated. Firstly, the study calculates revenue. To calculate the revenue, several steps are applied, firstly considering farmer's income:

$$\pi = TR - TC, \tag{1}$$

where π is the income, TR is the total return (IDR), TC is the total costs (IDR).

To calculate the total costs (TC), the following formula is used:

$$TC = TFC + TVC, \tag{2}$$

where TC is the total costs (IDR), TFC is the total fixed costs (IDR), TVC is the total variable costs (IDR).

Farm revenue (TR) is obtained using the formula:

$$TR = P \cdot Q, \tag{3}$$

where TR is the total revenue (IDR), P is the total price (IDR/Kg), Q is the quantity (Kg). Secondly, the study calculates marketing profit booked by an intermediary for each marketing and distribution channel available for corn producers. First, it is necessary to calculate the marketing profit equation:

$$\pi = Mp - Bp, \tag{4}$$

where π is the profit of corn marketing, M is the marketing margin of each corn marketing agency and the marketing costs of corn. Marketing margin is calculated as follows:

$$Mp = Pr - Pf, \tag{5}$$

where Mp is the marketing margin, Pr is the price at a consumer level (IDR), Pf is the price at a producer level (IDR). Marketing costs are calculated as follows:

$$Bp = Bp_1 + Bp_2 + Bp_3 + \ldots + Bp_n, \tag{6}$$

where Bp is the marketing costs for corn, Bp_1, Bp_2, Bp_3, until Bp_n is the marketing costs for each corn marketing agency. The last is to identify the efficiency ratio between prices at a producer and consumer level. To estimate the cost proportion to total product marketed, the study applies the formula used by Suddin et al. (2020):

$$Eps = \frac{Total\ marketing\ costs}{The\ value\ of\ the\ product\ being\ marketed} \cdot 100\%, \tag{7}$$

where the higher Ep value means the higher efficiency of a marketing chain (<1: Efficient,> 1:

http://dx.doi.org/10.21511/im.17(2).2021.05

Inefficient). With respect to marketing efficiency, the study uses the following equation (Suddin et al., 2020).

$$FS = \frac{Pf}{Pk} \cdot 100\%, \quad (8)$$

where FS (Farmer's Share) is the percentage of prices received by farmers (%), Pf is the price at a consumer level (IDR/Kg), Pk is a price at a farmer level (IDR/Kg).

3. DATA ANALYSIS AND RESULTS

3.1. Respondent characteristics

Based on the survey results, 70,84% of corn producers are in the age group of 31-50 years. A dominant education level is junior high school graduates – around 46,67%, senior high school –26,67%, and elementary school 25%. 47,50% are those producers who have 3-4 dependents, and 19,17% have 1-2 dependents. Generally, 45% of producers cultivate up to 1-2 ha land, and 28,33% have less than 1 hectare. 66,66% of producers have cultivated corn for more than 15 years.

Regarding the intermediary traders, they have slightly different characteristics. Traders are generally older and have a higher level of education. 83,33% of intermediary traders aged between 31 and 60 years. 66,67% are graduated from senior high school.Those traders who have 3-4 reached 46,67%, and 33,33% have 5-6 dependents. In general, 30% of traders have been in this business for 15 years and 23% – for 10-15 years. There are about 20% of traders who have been trading for 21-25 years. Their purchases tend to vary. The highest number of purchases reaches 11 to 20 tons per harvest by 40%. 43% are able to purchase up to 40 tons per harvest.

3.2. Corn farming business analysis

Results of corn farming business analysis are grouped into three stages, which are analysis of producers' revenue, intermediary traders' revenue and efficiency costs.

3.3. Analysis on corn producers

To analyze corn producers' revenue, an analysis of total production costs must be done, namely variable and fixed costs must be estimated.

The results indicate that variable costs incurred by a farmer vary. It is about IDR 5,980,000 per planting season. These costs can be classified into three categories, namely production input costs, labor costs, and land rental costs. Infrastructure for production costs (Saprodi) include the cost of seeds, fertilizers, and pesticides. The last two costs mentioned, fertilizers and pesticides, used by farmers are Urea, SP-36, and NPK, as well as Gramoxone. Labor costs also cover various activities including land cultivation, planting, fertilizing, harvesting and transportation.

The findings also suggest that land rental costs account for the largest portion of the three cost groups followed by input and labor. For input costs, the largest contributor is the cost of seeds and urea fertilizer afterward. Meanwhile, for labor costs, the largest costs are harvesting and tractor processing, respectively.

Table 1. Average variable costs of land per ha/planting season

Source: Primary data processed, 2020.

No.	Variable costs	Average value (IDR/Ha)	%
1	Saprodi	1.936.573	32,34
2	Labor Costs	1.560.210	26,05
3	Land Rental Costs	2.491.596	41,61
Total Average		5.988.379	100,00

In fixed costs, costs spent by producers can be classified into two categories and both of them are non-cash costs that is in charge in several production seasons. With the use of the Straight-Line depreciation method, on average the total fixed costs spent by a producer was about IDR 131,790 per planting season. The highest fixed costs spent is equipment depreciation is about 69,65% and followed by sprayer 30,35%.

Table 2. Average fixed costs per ha planting season

Source: Primary data processed, 2020.

No.	Fixed costs	Average (IDR)	%
1	Depreciation of Agricultural Equipment	91.790	69,65
2	Depreciation of the Sprayer	40.000	30,35
Total Average Fixed Cost		131.790	100,00

Using information of variable and fixed costs, the total costs of corn cultivation is calculated. The results indicate that the total average costs incurred by farmers in each season reach is about IDR 6,120,169, which consists of IDR 131,790 fixed costs and IDR 5.988,379 variable costs. This amount of total costs can be seen inthe following table:

Table 3. Total average costs of corn producers per ha/planting season

Source: Primary data processed, 2020.

No	Type of Cost	Average cost value (IDR)	Percent (%)
1	Fixed Cost (FC)	131.790	2,15
2	Variable Cost (VC)	5.988.379	97,85
Total Cost (TC)		6.120.169	100,00

Based on the production costs analyzed above, income obtained by corn producers is calculated. Income is the difference between revenue and total costs incurred during one growing season. Using the information on total costs and sales, the average farmer income per ha/crop in a season is IDR 4,022,831. This amount is calculated from the average amount of production (3,220 per ha/kg) and a selling price at a producer level, which is assumed to be IDR 3,150/kg.

3.4. Intermediary trader analysis

To begin with an analysis of intermediary traders, the study provides the results of market channel distribution accessed by producers. Based on interviews and observations, it is found that corn movement within a marketing and distribution channel can be classified into three levels: two-level channel, one-level channel, and zero-level channels.

Two-level channels consist of farmers, merchant collectors, wholesalers, and the animal feed industry. It connects two traders only, which are merchant collectors and wholesalers. In this two-level channel, the merchant collector ensures the corn movement from producers to the wholesaler's warehouse. In such a case, wholesalers bind merchant collectors since they are targeted to sell a certain amount of corn in a specific duration of time. These collectors are so-called active buyers since they intensely buy corn from producers with an undefined limit.

One-level channels involve farmers, merchant collectors, and breeders. This channel involves only one intermediary trader called merchant collectors. Different from the two-level channel, merchant collectors are passive. They buy corn from producers and keep it in their warehouses while awaiting consumers to buy it.

In a zero-level channel, producers directly sell their corn to breeders.Direct selling occurs when a number of producers bind themselves into a small group(s) to conduct a direct selling to breeders.

Concerning gross margin gained on each marketing and distribution channel accessed by producers, it is shown that each marketing channel has a different margin. These differences calculated from price differences between producers and end-users (breeders) without taking into account intermediary traders. The highest margin is gained by a two-level channel, which is IDR 500/kg or 16,20%. This marketing channel consists of merchant collectors and wholesalers, which earned a margin of IDR 250/kg or 8,33%for each of them. Secondly, it is marketing channel II that

Table 4. Analysis of corn producer average income per ha/planting season

Source: Primary data processed, 2020.

No.	Description	Average production per hectare (kg)	Unit price (kg/IDR)	Average income value (IDR)
1	Average Income of Farmers	3.220	3.150	10.143.000
2	Average Total Cost			6.120.169
Total of the Farmer's Average Income				4.022.831

http://dx.doi.org/10.21511/im.17(2).2021.05

Table 5. Average marketing margin in a corn marketing channel

Source: Primary data processed, 2020.

Marketing channel elements	Selling price	Purchase price	Average marketing margin	
			Value (Rp)/kg	%
Marketing chain I (Two-Level)				
1. Farmers	3.000	–	–	–
2. Merchant Collector	3.250	3.000	250	8,33
3. Wholesalers	3.500	3.250	250	7,69
4. Animal Feed Industry	–	3.500	–	–
Total of Marketing Margin			500	16,20
Marketing chain II (One-Level)				
1. Farmers	3.025	–	–	–
2. Merchant Collector	3.400	3.025	375	12,40
3. Breeders		3.400	–	–
Total of Marketing Margin			375	12.40
Marketing chain III (Zero-Level)				
1. Farmers	3.150	–	–	–
2. Breeders		3.150	–	–

booked a total marketing margin of IDR 375/kg or 12,40%. The zero-level channel did not show a margin since producers conduct direct selling to breeders without an intermediary trader.

Taking into account traders in each marketing distribution channel, it is indicated that the marketing margin is different for each marketing channel as each trader within the channel has a different selling price. The highest margin is earned by intermediary traders within a one-level channel (marketing channel II), which is IDR 375. It is followed by a two-level channel (marketing channel I), which is 250/kg.

Considering costs spent by each intermediary trader, traders spend marketing costs. These costs are transportation and costs for loading and unloading of products from transportation vehicle to a warehouse. It is found that these costs vary by types of traders and marketing channels.

Merchant collectors spent slightly different costs in a different channel. In a two-level channel, these traders spent slightly higher amount of money compared with one-level. It is found that they spend about IDR 95/kg, while within a one-level channel they spent 85/kg only. These differences occur due to transportation, loading and unloading activity, when merchants within a two-level channel transport the corn to the warehouse of the wholesalers scattered suburb in the city.

Differently, the costs spent by wholesalers within a two-level channel only, showed the highest amount – that is IDR 110, or 44% of the gross margin. These traders spent less costs since they transport the commodity in the same district at most. Loading and unloading costs are lower in a city than in a district.

Table 6. Average traders' income within each marketing channel

Source: Primary data processed, 2020.

No.	Marketing channel	Intermediary traders	Marketing margin/kg (IDR)	Marketing cost(kg)	Profit/kg
1	I	Farmers			
		Merchant Collectors	250	90	160
		Wholesalers	250	110	140
2	II	Famers			
		Merchant Collectors	375	85	290
3	III	Farmers			
		Breeders			
Total			875	285	590
Average			291.67	97,67	196.67

Thus, net income gained by a trader within the marketing channel could vary in amount and type of traders. Merchant collectors book a higher margin compared to wholesalers. In two-level channels, these traders gain IDR 160. One-level channels showed bigger margin –IDR 290. In their turn, wholesalers book lower margin –IDR 140. However, wholesalers sell in big capacity to the industry within the same or different provinces. Thus, they earn more comparing to merchant collectors.

3.5. Marketing efficiency

Farmer's share analysis is used to determine the marketing efficiency of corn. The results show that a zero-level channel has the highest farmer's share value, followed by one-level and two-level channels respectively. Within a zero-level channel, a trader is not involved. Producers directly sell their corn to breeders. In such a case, the price at a producer and a consumer level is the same. In their turn, the other two channels involve intermediary traders. The channels certainly allow price differences. That is why the farmer's share in a zero-level channel is 100% compared to other channels.

Table 7. Farmer's share for each marketing channel in South Sulawesi

Source: Primary data processed, 2020.

Marketing Channel	Price at Farmer Level (IDR/kg)	Price at the Consumer Level (IDR/kg)	Farmer's Share (%)
Marketing Channel I	3.000	3.500	85,71
Marketing Channel II	3.025	3.400	86,43
Marketing Channel III	3.150	3.150	100

4. DISCUSSION AND IMPLICATION

This study is intended to analyze the welfare of corn producers based on marketing and distribution channel options available in South Sulawesi, which is one of the corn production centers in Indonesia. The findings show that the average income of corn producers per hectare in one planting season is substantially low. The income value obtained by producers per season on 1 hectare is IDR 4,022,831 only for 99-110 days or on average 4 months of earning. Considering 2 hectares managed by each individual producer, for 45% of smallholder farmers, as given by respondent results, this amount is equivalent to IDR 2,011,415.5. This monthly amount of income is substantially low when compared to the level of minimum wages regulated by the regional government of South Sulawesi in 2021, which is IDR 3,165,000. This low-income condition is detected in several developing countries, among them, that are in Vietnam (Zimmer et al., 2018) and in the Philippines (Afidchao et al., 2014). Thus, smallholder farmers are sensitive to selling price, technological adoption, and production costs (Otekunrin et al., 2019; Tambo & Abdoulaye, 2012; Salami et al., 2010)

Several factors determining low income of producers are high production costs spent by farmers. Variable costs contribute to 97,85%. Such variable costs as the costs of renting land, fertilizers, and pesticides (inputs) are dominant and comprise up to 67% of the total variable costs. These high input costs are also stated by researchers in Java (Asmara, 2017) and also occurredin developing countries, such as Kenya (Muraoka et al., 2018), Vietnam (Zimmer et al., 2018), and Mexico (Sánchez et al., 2017). It is suggested that to reduce production costs at a producer level, the government should provide fertilizers and seeds at lower prices and ensure their stock exists in the market so that the price is stable (Krismawati & Sugiono, 2020; Rahayu et al., 2020).

Apart from variable costs, production costs could be efficiently reduced, particularly fixed costs, when farmers manage to cultivate wider lands. Logically, depreciation costs for agriculture equipment will be the same and the depreciation occurs due to time. Hence, the fixed costs spent for a wider land will be the same as narrow land, but the equipment used is the same.

In addition, the selling price at a producer level also affects widely farmers' welfare. One of the main reasons impacting price at a farmer level is market channel choice (Olwande et al., 2015). A wider channel distribution involves traders that lower the price at a farmer level (Nalini & Rohaya, 2015; Panda & Sreekumar, 2012). Each trader within a

http://dx.doi.org/10.21511/im.17(2).2021.05

marketing channel also earns profit, which in turn allows price differences. This condition is applied in agriculture products at most (Suddin et al., 2020; Naseer et al., 2019; Negi et al., 2018). When a marketing channel involves traders, the more traders are in the distribution channels, the lower the price at a producer level could be(Suddin et al., 2020). The reason is that the trader will push down the price to earn more profit and only a little possibility is available to drive up selling price since they are expecting demand from consumers (Onogwuet al., 2018). When the price is high, they are likely to face obstacles to stimulating the demand (Onogwuet al., 2018). This condition had been found in some areas of the Jeneponto Regency, where some of the producers access a two-level channel involving four layers (farmers, collectors, wholesalers, and breeders) with a selling price of IDR 3,000 / kg. In their turn, those producers who sell to an intermediary trader in a one-level channel could receive a slightly higher profit, which is IDR 3,025, while those who sell directly to breeders have a bit higher price, which is up to IDR 3,150.

Further, each individual trader is also likely to bear transportation, loading and unloading costs necessary for acquiring and selling the commodity (Shively & Thapa, 2017). These costs will push up the differences, particularly to inefficient spending (Onogwuet al., 2018). Hence, when involving traders, the more traders involved, the more costs are spent by all traders within the channel, which then allows to enlarge the price difference between producers and consumers. This condition has been studied by Masuku, Makhura and Rwelarmira (2001), Mmbando et al. (2016) in Tanzania and by Schipmann and Qaim (2011) in the case of sweet pepper in Thailand.

When taking into account end-users, the price at a consumer-level is high, which is up to IDR 3,500. This also may indicate that intermediary traders sell their products far away from production areas such as in border cities and cities even across the island. This condition is particularly true for a two-level channel that needs more than one trader to reach those particular consumers.

These findings also suggest that the direct selling to the consumers (breeders) does not increase substantially the welfare of farmers since the consumers (breeders) are likely to want to get a cheap price by making direct buying to producers. This also may explain, one of many other reasons such as volume and buying frequency, why only some producers prefer direct selling to breeders, not to an intermediary trader. This is in line with Schipmann and Qaim (2011).

The implication is that the low income generated from the corn farming in this province makes corn farming a side business (Nuryanti & Kasim, 2017). Farmers only plant corn once a year and only a small number of them cultivate it twice a year (Nuryanti & Kasim, 2017). Since it promises higher profits, rice is preferable (Awotide, 2016). This is especially valid during the rainy season. At the end of the rainy season, when the dry season starts, in some areas it is impossible to plant rice and farmers switch to corn (Nuryanti & Kasim, 2017).

The efficiency of a marketing channel is influenced by its length and shortness (Suddin et al., 2020). Marketing channels involving direct transactions between groups of farmers and consumers (breeders) have the highest efficiency value since the price level is the same for farmers and consumers (Hatima et al., 2020). When selling to an intermediary trader, it is also found that the price differences between farmers and consumers are not significantly different, which is why the efficiency is still high. It is supported by Suddin et al. (2020),who indicated that the farmer's share of more than 50% is still efficient. Corn is a common commodity that is successfully grown in all of the districts within the province, which allows buyers easily access the price at a producer level. Further, small buyers accept price differences, but high-volume buyers are likely to establish contacts with producers. Since small buyers are high in numbers and some of them located far away from production centers, especially individual breeders and household breeders, they are likely to buy from wholesalers.

With respect to efficiency, even though the marketing and distribution channel is highly efficient, it does not affect farmer's welfare since farmers only cultivate corn on limited and small land (maximum 2 ha per producer) so that the amount of revenue obtained in each season is low.

CONCLUSION

The study aims to examine marketing and distribution channels, as well as input costs spent by corn producers that could possibly affect their welfare. The study concludes that the average income earned by producers is substantially low when compared to minimum wage regulated in the province.

Two factors identified to influence adversely income level obtained by producers. Production costs, in particular variable costs, contributed to high total production costs. These input costs are contract land, fertilizers, and pesticides. Besides these costs, intermediary traders are also potentially pushing down selling prices at a producer level. Among three marketing channels accessed by producers, a two-level channel, a wider marketing channel, contribute to lower selling price at a producer level. It is followed by a one-level and zero-level channel. Marketing costs spent and the margin expected by each intermediary allows a wider-price difference between producers and consumers(breeders). The study also found that, even though these three-marketing channel affect income level obtained by producers, each marketing channel shows good efficiency.

To increase the income earned by producers, input prices such as variable costs for fertilizers and pesticides must be controlled by the government and be easily accessed by producers on the market to ensure stability of prices. Further, local government should allow producers to sell their corn to wholesalers, intermediary traders in the district level but not at a village level, who promise a higher selling price.

AUTHOR CONTRIBUTIONS

Conceptualization: Jusni Ambo Upe.
Data Curation: Andi Aswan, Jusni Ambo Upe.
Formal Analysis: Jusni Ambo Upe.
Investigation: Jusni Ambo Upe, Andi Aswan.
Methodology: Jusni Ambo Upe.
Project Administration: Jusni Ambo Upe, Andi Aswan.
Supervision: Jusni Ambo Upe, Andi Aswan.
Validation: Andi Aswan, Jusni Ambo Upe.
Visualization: Jusni Ambo Upe, Andi Aswan.
Writing – Original Draft: Jusni Ambo Upe, Andi Aswan.
Writing – Review &Editing: Andi Aswan.

ACKNOWLEDGMENT

The welfare of corn producers and marketing channel choice is part of an internal research grant project from Hasanuddin University. The research involves the regional government at village and sub-district level, and farmer groups in villages within the Province of South Sulawesi.

REFERENCES

1. Afidchao, M. M., Musters, C. J. M., Wossink, A., Balderama, O. F., & de Snoo, G. R. (2014). Analysing the farm level economic impact of GM corn in the Philippines. *NJAS-Wageningen Journal of Life Sciences, 70,* 113-121.https://doi.org/10.1016/j.njas.2014.05.008
2. Alderson, W. (2006). Marketing efficiency and the principle of postponement. In *A Twenty-First Century Guide to Aldersonian Marketing Thought*. https://doi.org/10.1007/0-387-28181-9_8
3. Beckman, T. N. (1940). Criteria of Marketing Efficiency. *The Annals of the American Academy of Political and Social Science*. https://doi.org/10.1177/000271624020900115
4. Binam, J. N., Tonyè, J., Wandji, N., Nyambi, G., & Akoa, M. (2004). Factors affecting the technical efficiency among smallholder

http://dx.doi.org/10.21511/im.17(2).2021.05

farmers in the slash and burn agriculture zone of Cameroon. *Food Policy*. https://doi.org/10.1016/j.foodpol.2004.07.013

5. Boslaugh, S., & Boslaugh, S. (2009). An Introduction to Secondary Data Analysis. In *Secondary Data Sources for Public Health*. https://doi.org/10.1017/cbo9780511618802.002
6. Boyd, K. C. (2013). Factor analysis. In *The Routledge Handbook of Research Methods in the Study of Religion*. https://doi.org/10.4324/9780203154281-22
7. Capstick, M., & Capstick, M. (2019). Agricultural Marketing. In *The Economics of Agriculture*. https://doi.org/10.4324/9780429287916-6
8. Chavas, J.-P., & Aliber, M. (1993). An Analysis Of Economic Efficiency In Agriculture: A Nonparametric Approach. *Journal of Agricultural and Resource Economics*. Retrieved from https://www.jstor.org/stable/40986771?seq=1
9. Chavas, J. P., & Nauges, C. (2020). Uncertainty, Learning, and Technology Adoption in Agriculture. *Applied Economic Perspectives and Policy*. https://doi.org/10.1002/aepp.13003
10. Dastagiri, M. B. (2013). Indian Vegetables: Production Trends, Marketing Efficiency and Export Competitiveness. *American Journal of Agriculture and Forestry*. https://doi.org/10.11648/j.ajaf.20130101.11
11. Dastagiri, M. B., Ganesh Kumar, B., Hanumanthaiah, C. V., Paramsivam, P., Sidhu, R. S., Sudha, M., Mandal, S., Singh, B., Chand, K. (2012). Marketing efficiency of India's horticultural commodities under different supply chains. *Outlook on Agriculture*. https://doi.org/10.5367/oa.2012.0103
12. Davis, N. M., Rose, A. N., & David, J. O. (2017). Determinants of small-scale mango farmers market channel choices in Kenya: An application of the two-step Craggs estimation procedure. *Journal of Development and Agricultural Economics*. https://doi.org/10.5897/jdae2016.0773
13. Fil'aini, R., Valentino, F., Dwi Safitri, S. A., & Haryanto, A. (2020). Fatigue Level Analysis for Post-Harvest Activities of the Corn Farmers in Tanjung Bintang, South Lampung. In *IOP Conference Series: Earth and Environmental Science*. https://doi.org/10.1088/1755-1315/537/1/012042
14. Gede, W., & Nyoman Djinar, S. (2019). Factors of influencing household production and welfare of corn farmers. *International Research Journal of Management, IT and Social Sciences, 6*(1), 103-112. https://doi.org/10.21744/irjmis.v6n1.599
15. Gonzalez-Padron, T. L. (2017). Ethics in the Sharing Economy: Creating a Legitimate Marketing Channel. *Journal of Marketing Channels*. https://doi.org/10.1080/1046669X.2017.1347005
16. Gruen, T. W. (1997). Relationship marketing: The route to marketing efficiency and effectiveness. *Business Horizons*. https://doi.org/10.1016/S0007-6813(97)90065-3
17. Hadi, S., & Hani, E. S. (2020). A study of long bean vegetable marketing (vigna sinesis l) in ambulu district, jember regency. *Jurnal Manajemen Dan Agribisnis*. https://doi.org/10.17358/jma.17.3.295
18. Hardesty, S. D., & Leff, P. (2010). Determining marketing costs and returns in alternative marketing channels. *Renewable Agriculture and Food Systems*. https://doi.org/10.1017/S1742170509990196
19. Hatima, H., Siregar, A. R., & Jusni. (2020). Analysis of corn agribusiness revenue in Bulukumba Regency. In *IOP Conference Series: Earth and Environmental Science*. https://doi.org/10.1088/1755-1315/492/1/012118
20. Jusni, & Aswan, A. (2020). Identifying sustainable agricultural commodities in Wajo regency. In *IOP Conference Series: Earth and Environmental Science*. https://doi.org/10.1088/1755-1315/473/1/012008
21. Key, N., Sadoulet, E., & De de Janvry, A. (2000). Transactions costs and agricultural household supply response. *American Journal of Agricultural Economics*. https://doi.org/10.1111/0002-9092.00022
22. Kline, P. (2014). *An Easy Guide to Factor Analysis*. *An Easy Guide to Factor Analysis*. https://doi.org/10.4324/9781315788135
23. Krafft, M., Goetz, O., Mantrala, M., Sotgiu, F., & Tillmanns, S. (2015). The Evolution of Marketing Channel Research Domains and Methodologies: An Integrative Review and Future Directions. *Journal of Retailing*. https://doi.org/10.1016/j.jretai.2015.05.001
24. Krismawati, A., & Sugiono. (2020). Crop productivity and financial feasibility of corn farming with various diverse fertilizer treatments on dry land. In *IOP Conference Series: Earth and Environmental Science*. https://doi.org/10.1088/1755-1315/456/1/012090
25. Liao, C. N., Chen, Y. J., & Tang, C. S. (2019). Information provision policies for improving farmer welfare in developing countries: Heterogeneous farmers and market selection. *Manufacturing and Service Operations Management*. https://doi.org/10.1287/msom.2016.0599
26. Mahanty, T., Bhattacharjee, S., Goswami, M., Bhattacharyya, P., Das, B., Ghosh, A., & Tribedi, P. (2017). Biofertilizers: a potential approach for sustainable agriculture development. *Environmental Science and Pollution Research*. https://doi.org/10.1007/s11356-016-8104-0
27. Mariyono, J. (2019). Stepping up from subsistence to commercial intensive farming to enhance welfare of farmer households in Indonesia. *Asia and the Pacific Policy Studies*. https://doi.org/10.1002/app5.276
28. Masuku, M. B., Makhura., M. T., & Rwelarmira., J. K. (2001). Affecting marketing decisions in the maize supply chain among

smallholder farmers in Swaziland. *Agrekon, 40*(4), 696-707.

29. Miedema, A. K. (1976). The Retail-Farm Price Ratio, the Farmer's Share, and Technical Change. *American Journal of Agricultural Economics*. https://doi.org/10.2307/1238821

30. Mishra, A. K., Harris, J. M., Erickson, K. W., Hallahan, C., & Detre, J. D. (2012). Drivers of agricultural profitability in the USA: An application of the Du Pont expansion method. *Agricultural Finance Review*. https://doi.org/10.1108/00021461211277213

31. Mmbando, F. E., Wale, E., Baiyegunhi, L. J. S., & Darroch, M. A. G. (2016). The Choice of Marketing Channel by Maize and Pigeonpea Smallholder Farmers: Evidence from the Northern and Eastern Zones of Tanzania. *Agrekon*. https://doi.org/10.1080/03031853.2016.1203803

32. Mmbando, Frank E., Wale, E. Z., & Baiyegunhi, L. J. S. (2017). The welfare impacts of market channel choice by smallholder farmers in Tanzania. *Development in Practice*. https://doi.org/10.1080/09614524.2017.1353066

33. Mounika, M. (2020). An Economic Analysis of Sorghum to Estimate Marketing Channels, Marketing Cost, Marketing Margin and Price Spread in Each Channel of Distribution in Kurnool District of Andhra Pradesh. *Indian Journal of Pure & Applied Biosciences*. https://doi.org/10.18782/2582-2845.8463

34. Muraoka, R., Jin, S., & Jayne, T. S. (2018). Land access, land rental and food security: Evidence from Kenya. *Land Use Policy*. https://doi.org/10.1016/j.landusepol.2017.10.045

35. Nalini, A., & Rohaya, I. (2015). An exploration on corn industry marketing channels. *Journal of Agrobiotechnology*. Retrieved from https://journal.unisza.edu.my/agrobiotechnology/index.php/agrobiotechnology/article/view/79

36. Naseer, M. A. U. R., Mehdi, M., Ashfaq, M., Hassan, S., & Abid, M. (2019). Effect of marketing channel choice on the profitability of citrus farmers: Evidence form Punjab-Pakistan. *Pakistan Journal of Agricultural Sciences*. https://doi.org/10.21162/PAKJAS/19.8671

37. Negi, D. S., Birthal, P. S., Roy, D., & Khan, M. T. (2018). Farmers' choice of market channels and producer prices in India: Role of transportation and communication networks. *Food Policy*. https://doi.org/10.1016/j.foodpol.2018.10.008

38. Nuryanti, D. M., & Kasim, N. N. (2017). Analisis pendapatan usahatani pola rotasi tanaman padi-jagung manis di desa mulyasari kecamatan sukamaju. *Journal TABARO*. Retrieved from https://ojs.unanda.ac.id/index.php/jtas/article/view/27

39. Olwande, J., Smale, M., Mathenge, M. K., Place, F., & Mithöfer, D. (2015). Agricultural marketing by smallholders in Kenya: A comparison of maize, kale and dairy. *Food Policy*. https://doi.org/10.1016/j.foodpol.2015.02.002

40. Onogwu, G. O., Osayi, C. P., & Okeke-Agulu, K. I. (2018). Effects of marketing costs on gross margin: Evidence from guinea corn retailers in Wukari, Taraba State, Nigeria. *Journal of Development and Agricultural Economics*. https://doi.org/10.5897/jdae2018.0937

41. Otekunrin, O. A., Momoh, S., & Ayinde, I. A. (2019). Smallholder Farmers' Market Participation: Concepts and Methodological Approach from Sub-Saharan Africa. *Current Agriculture Research Journal*. https://doi.org/10.12944/carj.7.2.02

42. Palobo, F. (2019). Analisis kelayakan usahatani jagung hibrida pada lahan kering di merauke, papua. *SEPA: Jurnal Sosial Ekonomi Pertanian Dan Agribisnis*. https://doi.org/10.20961/sepa.v16i1.30112

43. Panda, R. K., & Sreekumar. (2012). Marketing Channel Choice and Marketing Efficiency Assessment in Agribusiness. *Journal of International Food and Agribusiness Marketing*. https://doi.org/10.1080/08974438.2012.691812

44. Paulsen, M. R., Singh, M., & Singh, V. (2018). Measurement and maintenance of corn quality. In *Corn: Chemistry and Technology* (3rd ed.). https://doi.org/10.1016/B978-0-12-811971-6.00007-3

45. Pratiwi, W., & Canon, S. (2020). Analysis Of Factors Affecting Corn Farmers' Revenue In Gorontalo District. *Jambura Equilibrium Journal,1*(2). https://doi.org/10.37479/jej.v1i2.4382

46. Putri, R. K., Nurmalina, R., & Burhanuddin, B. (2018). Analisis efisiensi dan faktor yang memengaruhi pilihan saluran pemasaran. *Mix: Jurnal Ilmiah Manajemen*. https://doi.org/10.22441/mix.2018.v8i1.007

47. Rahayu, H. S. P., Irmadamayanti, A., Febrianti, T., Syafruddin, & Ishak, A. B. L. (2020). Barrier to entry and feasibility of community based corn seed agribusiness: Study case in Sigi Regency Central Sulawesi. In *IOP Conference Series: Earth and Environmental Science*. https://doi.org/10.1088/1755-1315/484/1/012122

48. Regency, D. K. (2015). Analysis of Production Functions and Efficiency of Corn at Patean District Kendal Regency. *JEJAK: Jurnal Ekonomi Dan Kebijakan,8* (2), 160-172. https://doi.org/10.15294/jejak.v8i2.6168

49. Sahro, H., & Chen, S. (2021). Analysis of superior crops location in east java, Indonesia. *Agricultural Socio-Economics Journal, 21*(1), 51-58.http://dx.doi.org/10.21776/ub.agrise.2021.021.1.7

50. Salami, A., Kamara, A. B., & Brixiova, Z. (2010). *Smallholder agriculture in East Africa: Trends, constraints and opportunities*. Tunis: African Development Bank.

51. Sánchez, B. I., Kallas, Z., & Gil Roig, J. M. (2017). Farmer preference for improved corn seeds in Chiapas, Mexico: A choice experiment approach. *Spanish Journal of Agricultural Research,15* (3), 1-15. Retrieved from https://inis.iaea.org/search/search.aspx?orig_q=RN:49042933

http://dx.doi.org/10.21511/im.17(2).2021.05

52. Sartina, S., Fattah, S., & Sanusi, A. (2021). Effectiveness and Efficiency Analysis of Mucipal Tax Revenue and Its Contribution toward Locally Generated Revenue in Sidereng Rappang District. *Hasanuddin Journal of Business Strategy*. https://doi.org/10.26487/hjbs.v3i1.420

53. Schipmann, C., & Qaim, M. (2011). Supply chain differentiation, contract agriculture, and farmers' marketing preferences: The case of sweet pepper in Thailand. *Food Policy*. https://doi.org/10.1016/j.foodpol.2011.07.004

54. Scopel, E., Triomphe, B., Affholder, F., Da Silva, F. A. M. E., Corbeels, M., Xavier, J. H. V., Lahmar, R., Recous, S., Bernoux, M., Blanchart, E., Carvalho Mendes, I. de, De Tourdonnet, S. (2013). Conservation agriculture cropping systems in temperate and tropical conditions, performances and impacts. A review. *Agronomy for Sustainable Development*. https://doi.org/10.1007/s13593-012-0106-9

55. Sebayang, V. B., Sinaga, B. M., Harianto, H., & Kariyasa, I. K. (2019). The impact of domestic policy on farmers' welfare and maize processing industry in Indonesia. *International Journal of Economics and Financial Issues*. https://doi.org/10.32479/ijefi.7910

56. Shively, G., & Thapa, G. (2017). Markets, transportation infrastructure, and food prices in Nepal. *American Journal of Agricultural Economics*. https://doi.org/10.1093/ajae/aaw086

57. Suddin, A. F., Muslimin, & Sarintang. (2020). Corn margin analysis in Takalar, South Sulawesi. In *IOP Conference Series: Earth and Environmental Science*. https://doi.org/10.1088/1755-1315/484/1/012139

58. Suprapti, I., Darwanto, D. H., Mulyo, J. H., & Waluyati, L. R. (2016). Technical Efficiency of Madura Farmers on Hybrid and Local Corn Farming in Guluk-Guluk District, Indonesia. *Journal of Eonomics and Sustainable Development, 7*(24), 154-158. Retrieved from https://core.ac.uk/download/pdf/234647751.pdf

59. Syaiful, S. A., Riadi, M., Mustaman, F. A., Amin, A. R., Farid, M., Mollah, A., & Makmur. (2020). Growth and production of South Sulawesi local waxy corn genotypes (Zea mays ceratina L.). In *IOP Conference Series: Earth and Environmental Science*. https://doi.org/10.1088/1755-1315/486/1/012099

60. Tambo, J. A., & Abdoulaye, T. (2012). Climate change and agricultural technology adoption: The case of drought tolerant maize in rural Nigeria. *Mitigation and Adaptation Strategies for Global Change*. https://doi.org/10.1007/s11027-011-9325-7

61. Taufik, M., Maintang, M., & Nappu, M. (2015). KELAYAKAN USAHATANI JAGUNG DI SULAWESI SELATAN. *Jurnal Pengkajian Dan Pengembangan Teknologi Pertanian*. https://doi.org/10.21082/jpptp.v18n1.2015.p

62. Tetik, A. H., Prasetyo, E., & Lukiwati, D. R. (2019). Analysis of Economic Efficiency for Use of Production and Income Factors in Local Cornself in Wewiku and Malaka Districts of Nusa Tenggara Timur Province, Indonesia. *Russian Journal of Agricultural and Socio-Economic Sciences, 92*(8), 10-18. https://doi.org/10.18551/rjoas.2019-08.02

63. Thiam, A., Bravo-Ureta, B. E., & Rivas, T. E. (2001). Technical efficiency in developing country agriculture: A meta-analysis. *Agricultural Economics*. https://doi.org/10.1016/S0169-5150(01)00081-0

64. Vartanian, T. P. (2011). Secondary Data Analysis. *Oxford Scholarship Online*. https://doi.org/10.1093/acprof:oso/9780195388817.001.0001

65. Wawo, A. H., Sumbogo, V. G., & Lestari, P. (2020). Comparison of seed germination and seedling growth between Indonesian local corn cultivars for deciding the quality of seed. *Biodiversitas*. https://doi.org/10.13057/biodiv/d210741

66. Widarma, G. (2019). Factors of influencing household production and welfare of corn farmers. *International Research Journal of Management, IT and Social Sciences, 6*(1), 103-112. https://doi.org/10.21744/irjmis.v6n1.599

67. Yuniarsih, E. T., & Taufiq, M. (2020). Analysis economic efficiency use of production factors corn farming on marginal land in South Sulawesi. In *IOP Conference Series: Earth and Environmental Science*. https://doi.org/10.1088/1755-1315/484/1/012141

68. Zimmer, H. C., Le Thi, H., Lo, D., Baynes, J., & Nichols, J. D. (2018). Why do farmers still grow corn on steep slopes in northwest Vietnam? *Agroforestry Systems, 92*(6), 1721-1735. Retrieved from https://agris.fao.org/agris-search/search.do?recordID=US201900014125