

# The Strategy of Business Process Integration and Competitive Advantage in a Supply Chain Collaboration with the Outcome Corn Farmers' Welfare in West Nusa Tenggara Province – Indonesia

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**Abstract:** *Tajidan, Doctorate Program of Agricultural Science, Faculty of Agriculture, University of Brawijaya, Malang, 2013. The Strategy of Business Process Integration and Competitive Advantage in a Supply Chain Collaboration with the Outcome Corn Farmer Welfare in West Nusa Tenggara Province – Indonesia. Advisors: Budi Setiawan, M. Muslich Mustadjab, and A. Wahib Muhaimin.*

*This research study was inspired by the low level of welfare among the corn farmers due to the implementation of trial and error strategy in supply chain collaboration. The literature study informed that the strategy of business process integration and competitive advantage in supply chain collaboration was able to improve the corn farmers' welfare.*

*Relevant to the above literature study, the objectives of the current research study were (1) to analyze the influence of business process integration and competitive advantage in the supply chain collaboration on the corn farmers' welfare; (2) to analyze the impact of the introduction of business process integration and competitive advantage in the supply chain collaboration on the improvement of corn farmers' welfare in West Nusa Tenggara Province. To achieve the objectives, the current study employed a survey technique involving 120 farmers from East Lombok District, i.e. 75 farmers from North Pringgabaya Village of Pringgabaya Sub-district and 45 farmers from Bebidas Village of Wanasaba Sub-district. The resulted data were then analyzed using Structural Equation Modeling of Data Analysis based on the variance of Partial Least Square. Results of the study showed that (1) the increase of business process integration and competitive advantage, and the improvement of supply chain management and supply chain collaboration, could bring a positive impact on the improvement of corn farmers' welfare, and (2) the following strategies were considered advantageous to improve the corn farmers' welfare:*

- (a) reducing the involvement of the intermediary agency that hindered the direct link between the farmers and the company;*
- (b) changing the pattern of profit-sharing, from net income based to gross income based; and*
- (c) Adjusting the buying of farming input and the selling of farming output according to the market price.*

**Keywords:** business process integration, supply chain collaboration, competitive advantage, farmer' welfare, corn

## 1. Introduction

### 1.1 Background

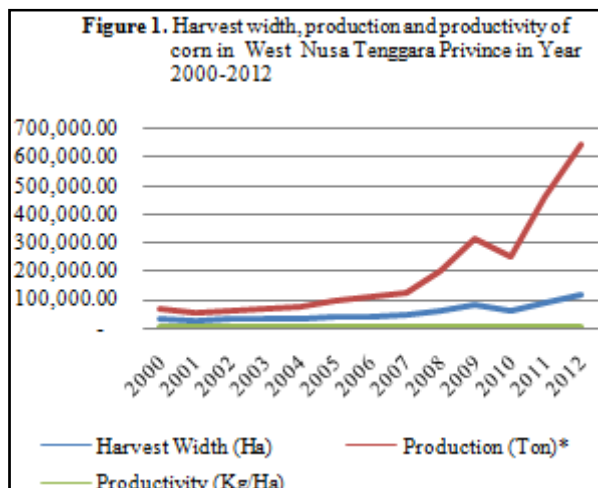
Corn is an important crop that has a strategic position in West Nusa Tenggara [1]; [2]. As a crop commodity, corn is ranked second to rice. It has a very important role as a support of national food security [3].

Due to such a strategic position, the production of corn has increased from time to time. The Corn Agribusiness Development Program is one of the national programs aimed to increase the corn production through the enlargement of harvest area and the improvement of productivity [4]. The data in **Figure 1** show a developmental trend of area expansion, production and productivity of corn in West Nusa Tenggara Province. Accordingly, the crop production has increased (22.36%.year<sup>-1</sup>) because the harvest area has been expanded through the use of agro-ecosystem of non-irrigated fields which are widely distributed through Lombok Island and Sumbawa Island [4]. It is possible to do

so because the existing farm lands in the regions of West Nusa Tenggara Province are mostly comprised of dry lands.

Realizing the potential of this non-irrigated field as a way of enlarging corn farming areas, the local government then encourages the establishment of supply chain collaboration between the agricultural companies and farmers to increase corn production. Since year 2009, PT Pertani, PT Sang Hyang Seri and PT SoeGee Commodity have participated in the corn production program and marketing in the non-irrigated field agro-ecosystem at Pringgabaya Sub-district of East Lombok District. Facilitated by Security Food and Energy Credit (SFEC) and Partnership Ecology Save Program within the Food Production Development Program, these companies assist the farmers in the technology transfer of crop cultivation, business counseling and provision of marketing facility. These companies have successfully stimulated the farming effort that is followed by the expansion of corn harvest area (**Figure 1**). The provision of cultivation technology facility has allowed the farmers to cultivate corn in three planting seasons, such as wet season,

first dry season and second dry season. As such, the corn commodity is available throughout the year.



Data Source: Processed from Data of the Agricultural Ministry of Republic Indonesia

\* Dry shelled corn

The success story of cultivation aspect, however, is not followed by the improvement of farmers' welfare due to an inappropriate strategy of supply chain collaboration used by the companies and their farming partners. The model of profit-sharing strategy and the lack of control from the companies in the recruitment of the farmers as partners are considered to have failed in building mutual relationship of supply chain collaboration. Farmers may abandon the supply chain collaboration made by the companies and as a result, the companies lose their partnership with the farmers [5]. This fact is indeed in contrast with the supply chain collaboration theory. In this relation, Mathuramaytha [6] states that supply chain collaboration represents the driving force of effective supply chain management, as it can help companies share risk and access to the resources required.

The failure to develop the supply chain collaboration is an issue which requires elaboration and more precise solution to guarantee the sustainability of mutually beneficial relationship, especially in the aspect of incentive harmony, between the companies and their farming partners [7].

Results of previous studies, as reported by Pawisari [8] found that the structure of supply chain pertaining to the supply chain collaboration between companies and farmers was always based on the concept of mutual trust with no binding contractual agreement (it was the key to success in the corn supply chain). A research study conducted by Simanjuntak [9] informed that the partnership quality could be improved through a long-term commitment, communication and risk sharing.

Viewed from the economic point of view, the business process integration and competitive advantage in supply chain collaboration is truly needed to minimize the costs and the capital requirement and to improve the services. The realization of supply chain organization therefore must be competitive {[6]; [10]; [11]}.

The strategy of business process integration and competitive advantage in supply chain collaboration has been suggested

as an approach that allows the companies to combine local and global information to reach a multi-focus and flexible process [12]. This argument is supported by Spekman, et al. [11] who says that business process integration in the multi-enterprise level will impact the improvement of the company competitive advantage and increase the company's overall variability in the supply chain through the value creation [13].

With the above rationale, the researchers considered that it was necessary to conduct an analysis of the strategy of business process integration and competitive advantage in supply chain collaboration with the outcomes of the farmers' welfare in the West Nusa Tenggara Province.

## 1.2 Statement Problem

As shown in the background, the main problem of this research study is to find out "How far can the business process integration and competitive advantage in supply chain collaboration guarantee the improvement of corn farmers' welfare in West Nusa Tenggara Province?" In detail, this problem is further formulated as follows:

- 1) How is the influence of business process integration and competitive advantage on the corn farmers' welfare?
- 2) Can the strategy of business process integration and competitive advantage in supply chain collaboration guarantee the improvement of corn farmers' welfare in West Nusa Tenggara Province?

## 1.3 Research objectives

The research objectives are stated as follows:

- 1) To analyze the influence of business process integration and competitive advantage in supply chain collaboration on corn farmers' welfare;
- 2) To analyze the impact of the introduction of business process integration and competitive advantage in supply chain collaboration on the improvement of corn farmers' welfare at West Nusa Tenggara Province.

## 1.4 Research Hypothesis

To achieve these objectives, the following hypotheses are proposed:

- 1) Business process integration and competitive advantage in supply chain collaboration have positive influence on corn farmers' welfare;
- 2) The strategy of improving business process integration and competitive advantage in supply chain collaboration has positive impact on the improvement of corn farmers' welfare in West Nusa Tenggara Province.

## 2. Research Method

### 2.1 Research Approach

This study employed a descriptive quantitative approach. A descriptive research study collects, processes, arranges and connects facts across variables. The results of the analysis are then interpreted in appropriate and rational ways [14].

## 2.2 Place and Time of Research

The current research study was conducted in East Lombok District. The choice of this site was based on the assumption that East Lombok was one of the centers of corn production in West Nusa Tenggara Province. Three indicators were determined for the purpose: (1) the harvest area, (2) the highest production, and (3) the most comprehensive marketing organization. The study took place from September 2012 to August 2013.

## 2.3 Sampling and Data Collection Method

In this study, samples were collected from sub-districts and villages using a purposive sampling technique [[14]; [15]; [16]; [17]]. Two sub-districts of East Lombok, i.e. Pringgabaya and Wanasaba Sub-districts were selected for the purpose. From each, North Pringgabaya and Bebidas Villages were determined as the village samples respectively.

The unit of analysis of the research was the farmer household that cultivated corn farming. The rationale for this was that the farmer household was considered as one of the institutions that were engaged directly with the corn supply chain. The study involved the total samples of 120 farmer households. The sampling unit per village was proportionally determined as follows: 75 households of North Pringgabaya Village and 45 households of Bebidas Village.

A survey method was used to collect data and information from these corn farmers. The data collection was conducted through interviews with all respondents. In addition, in-depth interviews were also performed with the relevant stakeholders who were involved in the corn farming development.

## 2.4 Data Analysis Method

To achieve the objectives of the research, hypothesis testing was performed through the use of inferential statistical analysis. This analysis tool is called Structural Equation Modeling based on the variance of Partial Least Square (SEM-PLS) supported by software Smart-PLS [[18]; [19]; [20]]. The formulation of Structural Equation Modeling is presented as follows [[21]; [22]]:

$$SCC = a_0 + a_1 IFC + a_2 DCS + a_3 ICH + e_1 \quad (2.1)$$

$$BPI = b_0 + b_1 SCC + e_2 \quad (2.2)$$

$$SCM = c_0 + c_1 SCC + c_2 BPI + e_3 \quad (2.3)$$

$$CPA = d_0 + d_1 SCC + d_2 BPI + d_3 SCM + e_4 \quad (2.4)$$

$$CFW = e_0 + e_1 SCC + e_2 BPI + e_3 SCM + e_4 CPA + e_5 \quad (2.5)$$

### Notes:

IFC = Information Sharing  
DCS = Decision Synchronization  
ICH = Incentive Harmony  
BPI = Business Process Integration  
e = error

SCC = Supply Chain Collaboration  
CPA = Competitive Advantage  
SCM = Supply Chain Management  
CFW = Corn Farmers' Welfare  
a, b, c, d, e = parameters

## 3. Results and Discussion

### 3.1 The Influence of Business Process Integration and Competitive Advantage on Farmers' Welfare

Results of Structural Equation Modeling analysis indicated that the business process integration had indirect influence on corn farmers' welfare, while the competitive advantage had the opposite. (Figure 2). Result of SEM analysis was described as follows:

$$SCC = 0.270 IFC + 0.276 DCS + 0.305 ICH + e_1 \quad (2.6)$$

$$BPI = 0.736 SCC + e_2 \quad (2.7)$$

$$SCM = 0.200 SCC + 0.746 BPI + e_3 \quad (2.8)$$

$$CPA = 0.202 SCC + 0.268 BPI + 0.376 SCM + e_4 \quad (2.9)$$

$$CFW = 0.148 SCC + 0.605 SCM + 0.188 CPA + e_5 \quad (2.10)$$

#### (1) The Influence of Business Process Integration on Farmers' Welfare

Business process integration is a set of value creation processes conducted by business actors ranging from the procurement of raw materials, the production processes, the products processing, transportation and storage. Indeed, business process integration was operated through vertical and horizontal integrations. Vertical integration was an act to shorten the linkage between the intermediary institutions with farmers and companies, such as eliminating the involvement of brokers and intermediary traders. In this way, the companies were able to engage the farmers in managing their post-production and output processing [23]. Thus this provided additional values to the farmers. Conversely, the horizontal integration was an act to incorporate a number of business units into a greater business unit. For example, a number of farmers joined together into a farmer group and/or a number of farmer groups merged into an association of farmer groups.

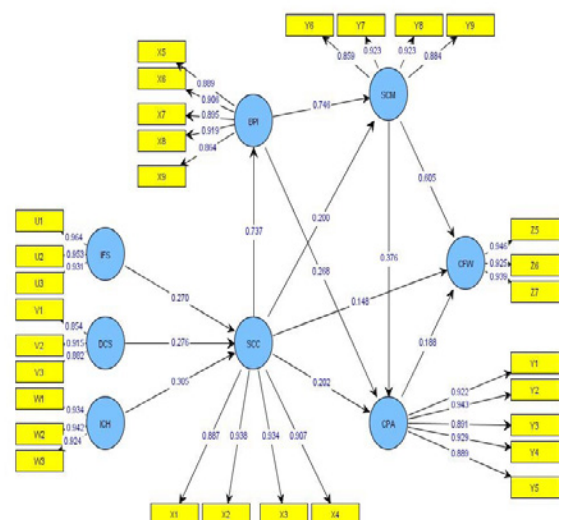


Figure 2: Conceptual Frame of Research and the Relationship between Variables

### Notes:

IFC = Information sharing  
U1 = Information of price  
U2 = Information of technology  
U3 = Information of credit skim  
DCS = Decision synchronization  
V1 = Production input type  
X6 = Low cost operation  
X7 = Future development  
X8 = Cash flow health  
X9 = Worker absorption  
CPA = Competitive advantage  
Y1 = Price/cost ratio

V2 = Input quality	Y2 = Product quality
V3 = Capital cost	Y3 = Delivery dependence
ICH = Incentive harmony	Y4 = Product diversification
W1 = Input price	Y5 = Journey length to market
W2 = Output price	SCM = Supply chain management
W3 = Cost sharing	Y6 = Coordination between agencies
SCC = Supply chain collaboration	Y7 = Product flow
X1 = Goal similarity	Y8 = Service flow
X2 = Role and responsibility	Y9 = Capital flow
X3 = Risk sharing	CFW = Farmer' welfare
X4 = Facilitator	Z5 = Ratio of producer' surplus/ production cost
BPI = Business process integration	Z6 = Sale volume
X5 = Good relationship with customer	Z7 = Ratio of profit/capital

The business process integration was found indirectly to have influences on the farmers' welfare through supply chain collaboration. The value of the influence was obtained at  $0.746 \times 0.605 = 0.451$  [Equation (2.8) and (2.10)]. This means that a change of one unit of business process integration resulted in a 0.451 unit of change in the farmers' welfare. The finding signified that the increasing integration of business processes would result in an increase in the welfare of farmers.

The above finding supports the logic construct that says if business process integration affects the competitive advantage and the competitive advantage affects the farmers' welfare, then the business process integration also affects the farmers' welfare. If the path coefficient is used, the above logic construct is then rejected. However, as the indirect effect was considered, this logic construct was therefore accepted. It was evident in the data that the indirect effect of business process integration on the farmers' welfare was greater than the direct effect of supply chain collaboration; each was represented by the values of 0,451 and 0,148 respectively

The exogenous variables of business process integration had positive and significant influences on endogenous variables of supply chain management and comparative advantage [Equation (2.8) and (2.9)]. This causality relationship is consistent with Barttezzaghi's [9] statement, which suggests that the integrated and collaborative business model be utilized as a business approach to allow the companies to combine local and global information to achieve multi-focused and flexible processes. Barttezzaghi's [9] argument is strengthened by Spekman, et al. [11] who argue that business process integration in multi-enterprises will bring impact on the improved competitive advantage of the companies and the company's overall variability in the supply chain through value creation and improve profit {[13];[24]}.

## (2) The Influence of Competitive Advantage on Farmers' Welfare

Competitive advantage is an ability of intra-organizations of supply chain to protect themselves from their competitors. The indicators used to measure the competitive advantage are price/cost ratio, product quality, delivery dependence, product innovation and travel time to market [6].

Results of SEM analysis showed that the competitive advantage directly affected the farmer welfare [Equation (2.10)]. A significant regression coefficient was found 0.188. This means that every one unit of change in the competitive advantage would result in the change of 0.188

unit of farmers' welfare. Increased competitive advantage has led to the increase of farmers' welfare. The improved farmers' welfare can be achieved through the minimization of production cost by buying the inputs at the lower prices, selling the outputs at higher prices, and improving the product quality at similar cost but with lower transportation and storage costs.

The improvement of competitive advantage has been focused on the policy of research and development, which includes the development of technologies pertaining to cultivation, harvest and post-harvest, and location adaptation testing. Estimated are number of people out of poverty through the adoption of hybrid corn varieties gradually climbed up the more than one million people per year [24]. The new varieties of corn with high productivity, drought resistant, pest and disease resistance, high responsiveness to fertilization, short-lived cycle and high yields are most preferred by consumers. Of various species of corn varieties, *Bisi Type 2*, *Bisi Type 222*, *Bisi Type 16* and *Bisi Type 18* are found to meet the criteria above.

Relative to the policy of research and development, the capacity and capability of human resources within the company is considered as the determinant factor that produces the company competitive advantage. After all human beings are the ones that control machines and allocate resources and capital. According to Suhendi [25] the capability of human resources plays an important role as a collective knowledge that was difficult to be imitated by certain companies because it is the result of development within certain periods of time. This statement is in line with that of Lengnick-Hall's and Lengnick-Hall [26], which states that the accumulation of capabilities of human resources, natural resources and the quality decision making will allow the company to take advantage of the available opportunities in the market as well as to minimize the risk/threat. On small and medium enterprises show that differentiation have a positive impact on firm performance [27].

The ability of supply chain organization to protect their product from competition and the attack of the competitors in the market is called competitive advantage. To develop this competitive advantage, Porter [28] proposes *the strategy competitive theory*, which is widely known as *Porter's five forces analysis*. Using these criteria, it was reported that the corn business competition in West Nusa Tenggara was highly tight because all corn regions were producing simultaneous products with almost similar variety and quality. This competition was even sharpened by the presence of imported corn from Asia and America countries in the domestic corn market, which then reduced the balanced prices of the domestic market.

Thus far, research and development have generated technologies, methods and/or new approaches that lead to the increased productivity of labor and land. Similarly the transfer of production technology has determined the production and productivity of corn farms, which in turn determined the value of production [29]. The aspect of productivity apparently becomes a potential aspect that needs addressing as regard to the issue of sustainability of supply. However, it was found out that the adoption of new

technology was still low among farmers due to a number of factors, such as the lack of stockists' and farmers' access to credit, the lack of farmers' ability to meet the optimal fertilizer needs, and relatively low level of farmers' education. This finding is not in line with that of Mghenyi, et al., [30]. This explains why the expectation to produce 50 quintals.ha<sup>-1</sup> was achieved in the study site until the year of 2013. Furthermore, it was found out that in 2010 the productivity average was 40.43.80 qu.ha<sup>-1</sup> of dried corn cob yields, or equal to 39.48 qu.ha<sup>-1</sup> dried kernel corn yields with the assumed yield of 60% and 54,92 qu.ha<sup>-1</sup> in 2012 (**Figure 1**).

When technology is adopted on an ongoing basis and uses the recommended optimal input to alleviate the farmers' problems, food production, supply, and support can be increased and thus supply chain management can be achieved [31]. The current findings show that differences of environmental conditions, such as farming fields versus rice agro-ecosystem and rainy season versus dry season, proved to have affected the use of technology and the optimum number of input variables. As a result, farmers were frequently disappointed with the results of their crop yielded because they were far below their expectations as well as that of the Field Officer. With the use of the recommended technology, the productivity was expected to achieve as high as 10 tonnes.ha<sup>-1</sup> of dried corn cobs. However, the fact shows that the results were varied, ranging from 3 to 6.58 tonnes. ha<sup>-1</sup>. This problem arose because of the minimal use of inputs and minimal use of cost as well. A number of farmers with the highest gross profit estimates were not using hybrid corn seeds, but they remained affected by the high cost of technology which was correlated with their net profits. Conversely, there were also other farmers with zero net profit gain stopped adopting the use of hybrid seeds [32].

Overall, it is suggested that the application of technology should be adapted according to the agro-climatic conditions of the region and the comparative advantages. The development of corn crop areas into marginal areas, such as agro farms, requires much more costs. Farmers, who work in the agro-ecosystem fields, require knowing the high cost-benefit ratio. The phenomenon as disclosed in this paragraph corresponds to the results of research conducted by Smale, et al. [33] in Mexico. These researchers concluded that in order to participate in the safety program of corn reserves, farmers should obtain a high benefit-cost ratio. Although the project has generated social benefits, such as employment opportunities, the evidence shows that there have been transfers of deficit in the household's welfare.

### 3.2 The Impact of the Introduction of Business Process Integration and Competitive Advantage in Supply Chain Collaboration on the Improvement of Corn Farmers' Welfare

The combination of direct and indirect influences showed that the improvement of business process integration and competitive advantage, and the improvement of supply chain management and supply chain collaboration could improve corn farmers' welfare. The implication of this is that the result of analysis could be used as an instrument to improve the level of corn farmers' welfare. In the future, this mission should be realized by both the company with the

government support through the implementation of various programs that supported the improvement of farmers' welfare and the increase of the company's profit. Such programs may involve the replacement of profit-sharing pattern of net income with gross income, and the determination of input and output prices based on the market price.

As farmers became members or parts of the supply chain and stepped in the coordination domain of the integrator. the business processes integration, competitive advantage, supply chain management and supply chain collaboration brought positive and significant impacts on the farmers' welfare. This was proved by the result of hypothesis test at p-value of 0.000 < p=0.01. The logic construct pertained to the improvement of business process integration and competitive advantage, and the improvement of supply chain management and supply chain collaboration, had brought about positive and significant impacts to the level of corn farmers' welfare in the research site. This logic construct is therefore, accepted by assuming that other variables in the model did not change.

**Table 1:** The Improvement of Farmers' Welfare with the Engineering of Exogenous

No	Exogenous Variables	Coefficient	
		Path	Determinant
1	SCC    CPA	0.1860	12.73
2	SCC    SCM	0.2690	18.59
3	SCC    BPI    SCM	0.4802	29.61
4	SCC    BPI    CPA	0.1851	12.33
5	SCC    SCM    CPA	0.1621	11.40
6	SCC    BPI    SCM    CPA	0.1868	13.67
	Total		98.33

**Source:** Processed from Primary Data.

**Note:** || = simultaneous

The modification of the collaboration supply chain theory put competitive advantage as output and farmer welfare as outcome, and supply chain management and supply chain collaboration were positioned as the mediating variable which produced a strong significant model with coefficient of determinant of 0.9833 or 98.33% (**Table 1**). This means that 98.33% variations in farmer welfare were caused by variations in the business process integration, competitive advantage, and supply chain management and supply chain collaboration simultaneously. The biggest variation of change was on the change of supply chain collaboration, business process integration and supply chain management, (29.61%).

High level of welfare had become everyone's expectations, including that of the farmer households. These expectations encompassed the fulfillment of food, cloth, housing, education, health and recreation. The first five demands are human basic needs that should be met. The last point (recreation) is a supplementary demand. The primary and supplementary needs can be met if the available income is adequate. This means that the income should be able to cover all of the expenses required to meet the primary and supplementary demands.

Corn farmers' welfare in the research site was very low as their income was less than US\$ 2 per capita per day. These

farmers were only able to meet 1/3 of the household expenses, i.e. IDR 1,500,000.00 per month. To increase their incomes, be the farmers could improve their performance simultaneously through the use of supply chain collaboration and supply chain management, business process integration, and company competitive advantage.

According to Hagedorn, et al. [34] the loss of farmers' welfare occurs due to the low marketing ability of corn farmers. Most products are usually sold when the market price is below the annual average price. This welfare loss can in fact be avoided through the adjustment of the sale time schedule.

Because of the low level of farmer welfare, lack of loyalty, and fragile morale and commitment, the majority or two-third of the total number of farmers did not fulfill their obligations to the companies. It was found out that only one third of these farmers was still loyal and fulfilled their financial responsibly for the companies. These conditions worsened and jeopardized the relationship between the farmers and the companies. Due to such an unbalanced relationship, the level of production went below the average because the farmers intentionally did not sell their farming outputs to the companies. Instead, they sold them to the traders who could give them a higher price or offered them to other traders to avoid the deduction of their debts. This avoidance issue needs further research.

As the quality of collaborative relationship between farmers and company worsened, it was necessary for the local government to produce a local directive that regulated the corn supply chain collaboration. The success story of the Farmers and Tobacco company partnership in West Nusa Tenggara Province convinced that It was vital to consider the inclusion of the cultural values and local wisdom in such a relationship [35].

## 4. Conclusions and Recommendations

### 4.1 Conclusions

Taking into account the facts and data analysis discussed above, the conclusions are stated as follows:

- (1) The improvement of business process integration and competitive advantage and the improvement of supply chain management and supply chain collaboration have brought positive impact on the improvement of corn farmers' welfare.
- (2) The strategies used to improve corn farmers' welfare include:
  - a. reducing the involvement of the intermediary agency that connect the farmers and company;
  - b. changing the pattern of profit-sharing, from net income-based to gross income-based, and
  - c. buying the farming inputs and selling the outputs based on the market price.

### 4.2 Recommendations

- (1) Suggestion for other researchers and for the development of knowledge:

- a. Further research is required to assess the effectiveness of supply chain collaboration and supply chain management in the ecosystems of rice field and non-irrigated field.
  - b. As the number of farmers who violated the contract agreement was greater than those who complied, it was necessary to conduct further research concerning factors that caused the violation of contract agreement and factors influencing the relationship sustainability between the companies and their farming partners.
- (2) Suggestion for the company in order to improve the supply chain management:
    - a. The company management that applied profit-sharing pattern with net profit 70:30 or 65:35 between farmers and company should change its policy into profit-sharing system using *total revenue based*.
    - b. The company motto "*the company is the farmer's friend*" must be implemented by applying 'mutual help principles' ("*besiru*") between company and farmers, elling the farming input based on market price, and buying the farming production (output) minimally on market price.
    - c. Besides cultivation counseling, post-production also needs to be planned to improve farmer welfare through involvement of farmers in the business process.
    - d. The risk of bad debts from the farmers and the field coordinator may be quite great. Thus, it is necessary to conduct careful selection of credit recipients based on sound and reliable credit criteria. Organizational structure must be simplified by trimming the unnecessary network.
  - (3) Suggestions for the government and for policy makers are proposed as follows:
    - a. It is suggested that the Government of West Nusa Tenggara Province release a Local Regulation of on Crop Supply Chain Collaboration and The Governor's Decree of on The Technical Guide of Operation for Corn Supply Chain Collaboration between Company and Farmers.
    - b. Specific policies for corn farmer protection are needed to stimulate the corn production through the purchase of corn excess supply. Thus, the corn price at farmer and consumer levels is relatively similar to that of premium.
    - c. The Government needs to continue to overcome the scarcity of the means of production during planting season because this problem can impact on the shortage of doses, the delay of fertilization supply, and surely, will result in the farmers' losses.

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