Developing agriculture value chain inclusive for small-scale vegetable farmers in the highland of Bedugul, Bali

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Abstract. As a major global tourist destination, the demand for a large variety of fresh produce in Bali has developed following the country of origins of tourists and their eating habits. The varieties of fresh produce demanded by hotels and restaurants have increased since the 1970s. More than 100 types of vegetables (leafy and fruity vegetables, tubers, roots, shoots, immature flowers) and herbs are produced in the highland of Bedugul, Bali. As the market competition increases, the small-scale vegetable farmers have to be more value-oriented, efficient, and effective in production and postharvest handling. How is the competitiveness of the evolving value chain to meet the dynamic needs of institutional consumers and retail modern markets? Therefore, the aims of the study were to assess the competitiveness of the vegetables value chains and develop a model design of value chain inclusive for small scale farmers for improvement.

This study was carried out through surveys and focus group discussions (FGD) involving actors in production and distribution channels. It was found that there were five groups of distribution channels, and most of them are less value-oriented. However, the emerging integrated value chains are shown, mainly to which derive from the institutional consumers (hotels and restaurants) and modern markets. A designed alternative model of value chain system inclusive for small-scale farmers has been developed, especially with the end on institutional consumers and modern markets.

1. Introduction
Bali is a small island with an area of 5,780 km², one of a province in Indonesia, and one of the world’s most popular tourist destinations. In 2018, approximately 15.8 million tourists visited Bali, consisting of 6.07 million foreigners and 9.76 million domestic tourists coming from other islands in Indonesia. Compare to local inhabitants for about 4.2 million, the number of tourists is significant to change different aspects of life, and it’s supports. The agricultural production sector has also changed as a consequence of adapting the eating food traditions of tourists. The development of food crops, horticulture, and herbs of more than 100 crop species and varieties in the Bedugul area, known as a center for vegetable and herb production in Bali, is one of the impacts of tourism [1].

The development of tourism also triggers the dynamics change of consumer values, which causes a change in the orientation of agricultural production. Previously, production was for the needs of the local people through interactions and transactions in traditional markets. The production then changed to be oriented towards consumer values developed in modern markets and institutional consumers (hotels, restaurants, and catering services) [2]. In general, changes in consumer values can occur at the city, province, and country levels, causing segmentation of consumer and market sophistication from
low to high. In markets with low consumer sophistication, value chain efficiency is also low due to the involvement of multiple intermediaries. In countries where consumers have high sophistication, such as Australia, Japan, and European countries, food chain efficiency is at the end of the chain [3]. In an integrated value chain, retailers directly affect producers through collaboration in creating the values required by consumers [4].

In the era before the COVID-19 pandemic, the variety of consumer segmentation for fresh products in Bali was very significant in line with the development of the tourism sector [5]. Markets from the lowest level (traditional markets), such as small stalls, to high levels of sophistication, such as hotels, restaurants, and modern markets spread over every district and city. In 2018, there were 323 star hotels, 1,798 non-star hotels, and 2,223 restaurants provide dining services [6]. However, there is a continuing issue that tourism development does not make a significant contribution to the farming community. This seems because of the production and supply chain does not meet the value requirement of the institutional consumers (hotels, restaurants, and catering services). Related to this issue, therefore, the provincial government of Bali issued a Governor's Regulation No. 99 in 2018 about the marketing and utilization of local Balinese products, which aims to increase the accessibility of local farmer’s products to institutional consumers and modern retail markets, and improve the farmer’s prosperity. The objectives of this study were to assess the value orientation of distribution channels of vegetables produced in the highland of Bedugul, Bali, and to develop a model design of value chain inclusive small-scale farmers for value orientation improvement.

2. Materials and methods
This research was carried out from February to June, 2019, focused on four vegetable products produced in the Bedugul area of Bali, namely tomato, chili, cabbage, and lettuce. First, the distribution channels for these four products were identified, starting from production to the end market. After obtaining the map of distribution channels, the work was continued with an analysis of the channels for their strength value orientation, which in this article is limited by interactions between chains in its orientation to create the value needed by consumers. The last is to develop a model of alternative value chain designs to improve its value orientation, especially a value chain connected to the final markets of institutional consumers and modern markets.

2.1. Identification of channel distribution and product weight losses
Identification of distribution channels was carried out through interviewing ten individual farmers for each vegetable product so that there were 40 farmers involved in this research. The farmers are spread over three villages, namely Candi Kuning Village and Pancasari Village in the Bedugul area, and Bangli Village, adjacent to Candi Kuning Village outside the Bedugul area. The sample farmers were selected (purposive sampling) based on their experiences in cultivating the vegetables and the adequacy to provide an overview of the various chain connection of their vegetable productions. Starting from the producer or farmers, respondents are then determined in each distribution channel, as shown in Table 1. This article also reports the total product weight losses that occurred in the whole distribution channels as an initial illustration of the inefficiency of the channels before analyzing their value orientation. The variety of distribution channels are shown in the results and discussion of this article.

2.2. Value orientation analysis
The value orientation analysis of the distribution channels was performed using eight criteria from Collins [7]. Each criterion is divided into four levels of orientation, namely from the least value orientation (level 1) to the greatest value orientation (level 4), as shown in Table 2.

The value orientation levels from Collins are then used as the basis for describing the strength of value orientation by calculating the cumulative level of values for all criteria. To make the analysis of value orientation easier, the total level scores were grouped into five, namely 8 (very weak), >8–17 (weak), >17–26 (moderate), >26–<32 (strong), and 32 (very strong).
Table 1. Samples of farmers, business actors, and the final market of this research.

| Business chain actors                                      | Number of samples |
|------------------------------------------------------------|-------------------|
| Growers/farmers                                            | 40                |
| Local collectors                                           | 12                |
| City Collectors                                            | 8                 |
| Suppliers for hotels, restaurants, catering services, and supermarkets | 4                 |
| Wholesellers (Baturiti wholesale markets)                  | 4                 |
| Supermarkets                                               | 2                 |
| Stars hotels                                               | 4                 |
| Non-standardized hotels                                    | 3                 |
| Retailers at traditional markets                           | 10                |
| International catering services                            | 1                 |

Table 2. Criteria and descriptive value orientation of distribution channels [7].

| No. | Evaluative criterion                                      | Characteristics of chain activities                                      | Least value orientation | Greatest value orientation |
|-----|-----------------------------------------------------------|--------------------------------------------------------------------------|-------------------------|---------------------------|
|     |                                                           |                                                                          | Level 1                 | Level 2                  | Level 3                 | Level 4                 |
| 1.  | The balance between price and value                       |                                                                          | Always price            | Usually price            | Usually value           | Always value            |
| 2.  | Amount and type of information shared                      |                                                                          | No significant information shared                                      | Little information shared | Some information shared | Extensive information shared |
| 3.  | Time orientation                                           |                                                                          | Short term, transaction to transaction                                 | Short term, periodic     | Short to medium term   | Medium to long term     |
| 4.  | The nature of relationships                               |                                                                          | Adversarial              | Occasionally cooperative | Mostly cooperative      | Collaborative           |
| 5.  | Interactions between chain members                         |                                                                          | Transaction based        | Mostly transaction based | More relationship based | Always relationship based |
| 6.  | Dependence in the chain                                   |                                                                          | Independence             | Occasionally relies on others | Usually relies on others | Interdependence          |
| 7.  | Power in the chain                                         |                                                                          | The individual has the power                                           | The individual has the power | Some recognition of the consumer | The consumer has the power |
| 8.  | Orientation of chain members                               |                                                                          | Always self maximizing                                             | Self first, chain second | The chain first, self second | Always chain optimizing |

2.3. Value chain model design
The result of the value orientation analysis of the distribution channels was verified and discussed in the focus group discussion (FGD) attended by the representatives of each sample chain, as shown in Table 1. The researchers directed the FGD to come up with the best value chain alternative model to meet the value requirements of institutional consumers and modern markets. In the Bali Governor Regulation Number 99 of 2018, hotels, restaurants and catering services must accept or utilize local products at least 30%, and modern markets at least 60%. The value chain design model inclusive for small-scale farmers is expected to meet the consumer demand of institutional consumers and modern markets.

3. Results and discussion
3.1. Distribution channels
There are five different groups of channels distributions for the four research object products from the producers to the primary channel (Figure 1).
1. The first group, growers connect directly to supermarkets, institutional consumers (hotels and restaurants), urban organic farmer markets, and door to door sales to urban consumers (blue color lines).
2. The second group, growers connect to local traditional or the subdistrict wholesale market, and in general, the next trajectory is to wholesale markets related to city collectors. From the city collectors, the products headed to traditional urban markets and institutional consumers (orange color lines).

3. The third group, growers connect to local collectors as suppliers, then to supermarkets and institutional Consumers, as well as to the local traditional market for, especially rejected products (green color lines).

4. The fourth group, growers connect to local collectors, then to city collectors or to the wholesale market, and from the wholesale market connects to city collectors and finally end markets (dark blue color lines).

5. The fifth group, growers connect to local collectors, then to city collectors, and further connected to end markets (black color lines).

**Figure 1.** Distribution channels of vegetables (tomato, chili, cabbage, and lettuce) produce in the Bedugul area of Bali.

The role of the subdistrict wholesale market, local and city collectors is very significant to characterize the inefficiency of distribution channels. The 2nd, 4th, and 5th distribution channel groups are heritage-traditional distribution channels, and only slight changes occur, especially in the variation of end markets. Based on the tracing of distribution channels and direct interviews with the respondents from growers to end markets and discussions in FGDs, the product weight losses for the three groups of distribution channels are relatively high. The second group that connects growers to the district wholesale market then goes to the next channel, the loss was around 15–35%. Meanwhile, the growers connect directly to the traditional retail market; the loss was much smaller, at 10–20%. This indicates that the long traditional distribution channel is very inefficient compared to the short traditional distribution channel. For the fourth and fifth channel groups, connecting the growers to local collectors and then to the subdistrict wholesale market or city collectors, the losses were more diverse. For the fourth distribution channel group, losses ranged from 20–42%, and for the fifth channel group, the losses ranged from 18–34%.

In the first channel group, however, where growers are directly connected to dynamic high-value markets, namely modern markets, institutional consumers, and city organic farmers markets, the value of the loss is lower by about 5–15%. For the third channels group, where products connected from growers to suppliers then go to institutional consumers and modern markets, the weight loss was around 9–18%. These two distribution channel groups have lower losses compared to the other three groups. Thus, there is significant value creation in these two groups of distribution channels. However, based on the percentage of the losses, they still need improvement to increase efficiency.
3.2. Value orientation analysis

Based on the evaluative criteria of value orientation from Collins [7] and the total accumulative value of all the criteria, it can be seen that for the distribution channel group two and four, the value is the same 11, while the value of the fifth group is 15 (Table 3). This means that the value orientation for those three distribution channels is still weak. In contrast, the value orientation of groups one and three are 26 and 28, respectively, the value orientation is strong. These two groups certainly have a much stronger value orientation than the previous three groups. In the FGD, the participants agreed that the dominant (75%) flow of vegetable products from the Bedugul area through traditional distribution channels, and only 25% through value-oriented channels. Therefore, the vegetable productions and their supply chains in Bali are not efficient and effective in fulfilling high-level markets’ requirements. Referring to Governor Regulation No. 99 of 2018, where institutional consumers and modern markets are mandatory to use local products of at least 30% and 60%, respectively, are difficult to be fulfilled by the current local agricultural system. Therefore, it is vital needs to transform the traditional agricultural system to be a value-oriented system.

| Channel distribution | Evaluative criteria | Total value |
|----------------------|---------------------|-------------|
| Group 1              | 3                   | 26          |
| Group 2              | 2                   | 11          |
| Group 3              | 3                   | 28          |
| Group 4              | 2                   | 11          |
| Group 5              | 2                   | 15          |

Note: 8 (very weak), >8–17 (weak), >17–26 (moderate), >26–<32 (strong), and 32 (very strong)

3.3. Value chain model design

In the FGD, it was addressed that consumer values in institutional consumers driven by tourism are developing very dynamically, not only from the aspect of the product’s intrinsic quality but also the extrinsic quality, apart from services. Based on the value orientation analysis, which was further discussed in the FGDs and new information raised, a simple value chain model emerged, as shown in Figure 2. This basic frame of the value chain model system is made simple to be easily understood by chain actors involved in the FGD. Value is an experience that can provide customer satisfaction so that it arises willingness to pay [8,9]. In the FGD, it was stated that the value needed by consumers had developed not only the intrinsic quality but also extrinsic quality and services. Extrinsic quality is quality that does not attach to the product [10], such as branding, eco-labeling for environmental protection, protected geographical indications, traditional specialty guarantee, and others [11]. Services is a job to satisfy customers [12], in the FGD, it was mentioned that the service required includes product replacement if the product out of standard, flexibility to market changes and customer desires, participating as a sponsor if there are special events in hotels and supermarkets, product promotion and discount in supermarkets, and others.

The location of the Bedugul area, as a production center of vegetables in Bali, is not far from high-value markets in all districts and cities. So, in what value creation system is needed by the high-level markets? The answer is by bringing value consumers closer to producers. Since the producers are small-scale farmers and mainly family farmers, the capacity to bring the products by farmers directly to consumers, in most, is weak. Therefore, the intermediary as a supplier is required for bridging the product from producers to especially high-level markets.

Value is created in a value chain system that involved an integrated and collaborative manner of the producers, supplier, and end market. The value activities of each chain must be supported by a support system that can optimally drive the main value creation activities. The support system includes the provision of seeds, water, fertilizer, capital, and others. The capacity of human resources and technology...
is an essential supporting factor that has to be considered available in each value activity across the whole value chain. The postharvest period, a bridge between production and consumers, also requires supporting factors to prepare value products properly. These supporting factors include standard packinghouse, inbound and outbound logistics, equipment and materials, and others.

![Figure 2](image)

**Figure 2.** A basic frame model design of value chain inclusive for small-scale farmers in Bali.

The dynamic development of information and communication technology (ICT), which has driven the industrial revolution 4.0, is a must for its inclusion in the value chain design model. With the ICT, control systems in plant cultivation, as well as product handling in the packinghouse, will be able to increase the efficiency and effectiveness of value creation significantly. The quality assurance and food safety system have to be well integrated into the value chain system. Therefore, ICT is essential needed to strengthen the value chain system.

4. **Conclusions**

There are five groups of vegetable distribution channels produced in the Bedugul area of Bali. Three channels groups are weak in value orientation, in which the role of local and city collectors, as well as traditional retail markets are significant. Two other channel groups are strong value-oriented, in which producers connect directly or via local collectors act as suppliers to the high level markets of institutional consumers and modern retail markets.

The designed value chain model suitable for Bali is by bringing the value consumers closer to the producers. Since the producers are small-scale farmers, involving an intermediary or supplier to work collaboratively with the supporting farmers in value creations is necessary.

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