Journal of Biometrics & Biostatistics
ISSN: 2155-6180
Sampurna et al., J Biom Biostat 2019, 10:1
Research Article
Open Access

Analysis of Biplot to Identify Marketing of Commodity Results Bali Cattle Livestock in Simantri Badung District, Bali

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Abstract

The data obtained were analyzed by Factor Analysis. The data obtained from the research and marketing objectives of the Gapoktan in Simantri, Badung Regency, Bali Identification of the marketing objectives and marketed commodities, as a variable is the purpose of marketing of the commodity produced by Bali cattle breeding in the farmer group in Simantri The regency and the object is the result of Bali cattle breeding in the gapoktan in Simantri Badung regency. The results showed that the marketing objectives of the produced by the Gapoktan in Simantri Badung regency were collectors, animal markets, government, other Gapoktan, farmers and other places. The most widely marketed commodity is solid fertilizer, the next is an expelled female Bali cattle, male Bali cattle seed, female Bali cattle seed and the least is a liquid fertilizer.

Keywords: Biplot; Commodity; Bali cattle; Gapoktan; Simantri

Introduction

Bali cattle farms are carried out by a combination of farmer groups (Gapoktan) in an integrated farming system (Simantri) in Badung regency, Bali; holding important roles in the agribusiness system. Marketing of livestock products and their products as one of the links of the Simantri agribusiness system plays a very important role in business development. One of the main factors causing the rapid development of Bali cattle breeding business in the province of Bali, is due to the creation of a good marketing system, where farmers can directly market their produce in the form of cows or by-products in available markets, and farmers have many alternatives in determining the desired buyer with a price level that varies with each other. Likewise in the case of procurement of seed cows, farmers can directly choose the cows they want from several traders in the livestock market. The integrated farming system, better known as Simantri, has become a model of regional agricultural development in Bali's proposition, and one of them is Bali cattle farming. The aim of integrated farming development is to encourage the development of integrated and agribusiness-oriented agricultural businesses, producing quality and empowered organic agricultural products. competitiveness, encourage the development of agricultural businesses that produce products that have added value, increase income, and welfare of farmers while encouraging the growth of the economy in rural areas [1,2].

Technically, Simantri is a broad agricultural integration activity covering food crops, secondary crops and horticulture, livestock, fisheries, plantations and forestry plants in one area/location of activities. Simantri is also a model for pilot development in accelerating technology transfer to rural communities. Dynamics and information about Simantri activities in the process of rural agricultural development by the Bali proposition have become a widespread public concern. Integrated Farming System or Simantri is oriented towards agriculture and livestock business without waste (zero waste) by producing 4 F (food, feed, fertilizer, and fuel). The main activity is the integration of cultivation of plants and livestock, processed plant waste for animal feed and feed reserves in the dry season. In addition, livestock solid waste (feces) is processed into biogas and organic fertilizer, thus providing confidence for long-term business.

Towards food independence, animal feed, organic fertilizer [3]. Through imperial approaches and studies in several locations of Simantri activities (partially), it illustrates that the efforts made to develop agriculture in rural areas through Simantri activities provide great hope for achieving prosperity of farmers and rural communities, In an effort to accelerate the role of Simantri in an effort to achieve the welfare of the farmers of commodity marketing the results of the Bali cattle farms and the main community marketing need to be identified to make it easier to make improvements. The refinement process and the role of leadership stakeholders and policymakers in various marketing activities and commodity nodes marketed from Bali cattle farms need to be continuously improved. Bali cattle is one of the sub-symptoms of Simantri which plays an important role in measuring the success of the implementation of Simantri in breeders. The success of Simantri cannot be separated from the role of Bali cattle farming as a sub-system of Simantri, especially regarding the commodities marketed and its marketing target. For this purpose, it is deemed necessary to conduct a research on biplot analysis to identify the marketing of Bali cattle commodity in Simantri in Badung Regency.

Biplot is an exploration method of multiple variable data analysis that can provide a graphical description of the closeness between objects, diversity of variables, the correlation between variables, and the relationship between variables and objects. In addition, biplot analysis is used to describe the relationship between variables and objects that are in high-dimensional space into a two-dimensional space [4,5]. Marketing objectives as variables will be described as directed lines, marketing objectives that are positively correlated will be described in the same direction, or form narrow angles, marketing objectives that are negative correlations depicted in lines in the opposite direction, or

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Received January 19, 2019; **Accepted** February 18, 2019; **Published** February 22, 2019

Citation: Sampurna IP, Suharsono H, Sukada IM (2019) Analysis of Biplot to Identify Marketing of Commodity Results Bali Cattle Livestock in Simantri Badung District, Bali. J Biom Biostat 10: 423.

form blunt angles, while uncorrelated ones are described in the form of two lines with an angle close to 90° (right). While the closeness between objects, namely the marketed commodity can be seen based on the location of the coordinates, the commodity marketed with the same characteristics will be described as two points with adjacent positions. The marketed commodity that is located in the direction of the direction of a marketing destination and its coordinates is located at the end of the arrow, it is said that the commodity marketed is above the average value. Conversely, if another marketed commodity is located opposite to the direction of the destination. marketing, the marketed commodity has a value below the average. While the commodity which is marketed almost in the middle has a value close to the average [6].

For this purpose, it is deemed necessary to conduct a research on biplot analysis to identify the marketing of Bali cattle commodity in Simantri in Badung Regency. So that this graphical demonstration is expected to get an overview of the marketed commodity and an overview of marketing objectives, both in terms of diversity and correlation, and the linkages between commodities that are marketed with marketing objectives.

Materials and Methods

Samples and research tools

This research is deskretidf qualitative verification research conducted by purposive sampling to determine Badung district as a sample of 8 districts in the Bali proposition. The sampling of Bali cattle breeders in Simantri Gapoktan in Badung regency was carried out by saturated sampling technique.

The data was obtained by directing it to the Bali cattle ranchers in 50 pieces of the Simantri Gapoktan in Badung regency, being examined about the commodities marketed and the marketing objectives. Commodities marketed include expelled female Bali, male Bali cattle seed, female Bali cattle seed, solid fertility, and liquid fertilizers, while marketing objectives include government, other Gapoktan, animal markets, collectors, farmers, others places.

The marketing percentages of each commodity marketed with runs:

$$\mathbf{Dij} = \sum_{i=1}^{6}\sum_{j=1}^{5}(\sum_{k=1}^{\theta} Yijk)$$

Where:

Dij is: the number of i-marketing and j-market commodities

Yijk are: data on the i-marketing target, the J-marketed commodity, in the first Gapoktan.

Research variables

The variables of this study include marketing objectives consisting of farmers, government, Gapoktan others, animal markets, collectors, farmers, other places (ornamental plant traders, individuals and so on), while objects or commodities marketed include paneled female Bali cattle, male Bali cattle seed, Bali female cattle seed, solid fertilizer, and liquid fertilizer.

Data analysis

The data obtained were analyzed by Factor Analysis as a variable is the main purpose of product marketing and as an object is a commodity that is marketed produced by Bali cattle farms in Simantri Gapoktan Badung regency, biplot simulation to determine the location of marketed Komodo coordinates is determined based on Factor Scores Method Regression Analysis procedure using SPSS 25.

Results and Discussion

Research result

The results of the analysis of factors were expelled variables of female cattle, male Bali cattle seed, female Bali cattle seed, solid fertilizer, and liquid fertility was shown in Table 1 and Figure 1.

Table 1 shows the marketing objectives of the Bali cattle commodity marketed by Gapoktan in Simantri in Badung regency, which shows that 99.422% can be described in the eigenvalues of two dimensions. The Scree Plot (Figure 1) shows that at the Eigen root value the first and second main components occur quite sharply. These results indicate that the use of the two main components is considered capable of explaining the diversity of marketing objectives of Bali cattle marketed at the farmer groups in Simantri, Badung regency, Bali.

The results of the Factor Scores Method Regression analysis on the location of marketed commodity candidates obtained the largest coordinates of the commodity marketed in Simantri in Badung regency, namely 0.689, followed by expelled female Bali female at 0.768, male Bali cattle seed at 0.363, female Bali cattle seed is -0.490, and the smallest is liquid fertilizer -1.510 (Table 2).

Table 2 shows that government, Gapoktan, and other places are in quadrant I, which is in quadrant II are animal markets and collectors, and those in IV quadrant are farmers. While the marketing objectives are in solid fertilizer quadrant I, this shows that solid fertilizer is marketed to governments, Gapoktan, and other places. Expelled female Bali cattle and male Bali cattle seed in quadrant II, this shows that the commodity is marketed to collectors and animal markets. Whereas the female Bali cattle seed was in the quadrant III, because there was no

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative%
1	4.880	81.340	81.340
2	1.085	18.082	99.422
3	0.027	0.442	99.864
4	0.008	0.136	100.000

Table 1: Total variance of explained marketing goals of commodities marketed.

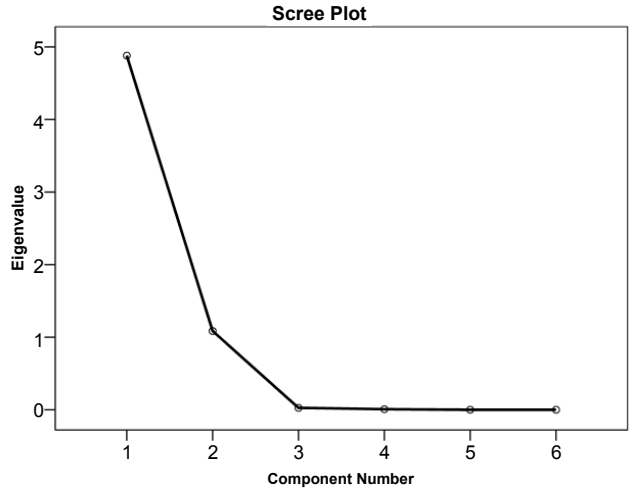

Figure 1: Screen plot of marketing goals of commodities marketed.

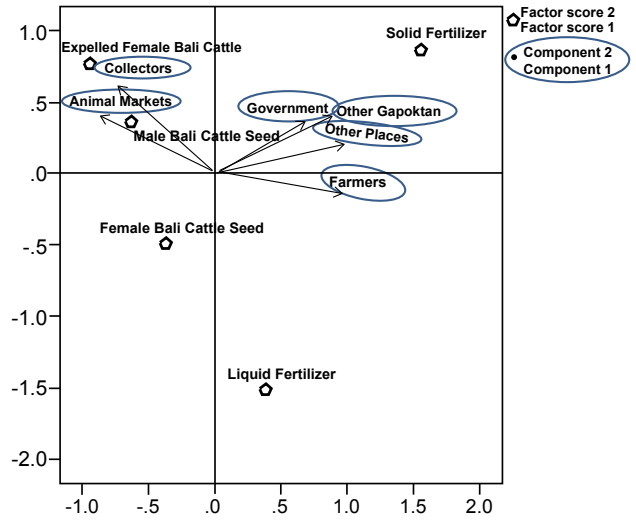

Figure 2: Biplot of Commodities Marketed and Marketing Goals at Gapoktan in Simantri Badung Regency.

Quadrant	Commodity Marketed and Marketing Goals	Factor	
		1 (Absis)	2 (Ordinate)
I	Solid Fertilizer	1.558	0.869
II	Expelled Female Bali Cattle	-0.941	0.768
II	Male Bali Cattle Seed	-0.632	0.363
III	Female Bali Cattle Seed	-0.372	-0.490
IV	Liquid Fertilizer	-0.387	-1.510
I	Government	0.871	0.486
I	Other Gapoktam	0.896	0.441
I	Other Places	0.970	0.210
II	Animal Markets	-0.902	0.430
II	Collectors	-0.772	0.635
IV	Farmers	0.984	-0.147

Table 2: Koordinates of Commodities Marketed and Marketing Goals at Gapoktan in Simantri Badung Regency, Bali.

marketing objective in Quadrant III, this showed that the Bali female cattle seed produced by Bali cattle farms at Gapoktan in Simantri of Badung district was also marketed to animal markets and collectors. Solid fertilizers are in quadrant IV, this shows that the solid fertilizers produced by Bali cattle farms in Gapoktan in Simantri Badung district are mostly marketed to farmers.

The description of the marketed commodity and the purpose of pemasannya can be described as a biplot graph like Figure 2.

The purpose of marketing is illustrated by vectors of the same length and angles between different vectors. The length of the vector shows the diversity of marketing objectives, while the angle between the vectors shows the correlation between the goals of enlargement. The vector is in the same direction and has a sharp angle close to 0°, the correlation is close to 1, while the angle between the vectors is close to the angle 90° (right), the correlation is close to 0 (no correlation). Vectors that are in the opposite direction or from a blunt angle (>90°) indicate a negative correlation. Animals markets with collectors are positively correlated but are negatively correlated with farmers, while between government, Gapoktan, other places, and farmers are positively correlated even though the angles formed are not the same. Results that have a positive correlation between collectors and animal markets show that community. It was marketed to two marketing places, for example, expelled female Bali cattle, male Bali cattle seed marketed to collectors and animal markets.

The location of the Balinese beef farm community at Gapoktan in Simantri Badung regency that is felt shows conformity with the marketing objectives, the closer it is to a particular marketing destination, the marketing purpose of the erudite is to the marketing objectives. Solid fertilizer produced by Bali cattle farms at Gapoktan in Simantri of Badung regency is at the end of the arrows for marketing, government and other Gapoktan objectives and still one quadrant with other places, this shows that solid fertilizer is mostly bought by government and other Gakpotan, but there are also other places that buy it like ornamental plant traders or households. Expelled female cattle and male Bali cattle seed produced by Bali cattle farms at Gapoktan in Simantri Badung district together with quadrant II and both marketed in collectors and animal markets, but expelled female Bali cattle are at the tip of collectors arrows, while male Bali cattle seed is closer to animal markets, this shows that expelled female Bali cattle are mostly marketed to collectors from the male Bali cattle seed. The female Bali cattle seed is in the Quadrant III, while the marketing place is not in the Quadrant III, this shows that the Bali cattle seed produced by Bali cattle farms at Gapoktan in Simantri Badung regency is partly marketed to farmers and also to animal markets and also to collectors. Solid fertilizer produced by Bali cattle farms at Gapoktan in Simantri, Badung regency, is marketing to government, Gapoktan other, other placers and farmers, while liquid fertilizer is mostly marketed to farmers.

Besides that, the market location of the commodity also shows the number of Bali cattle farms in the Gapoktan in Simantri Badung regency that are marketed, if they are further below the X-axis (the abscissa is smaller) it shows that the commodity is still slightly marketed, on the contrary, if it is far above the X-axis (the abscissa is getting bigger) then shows that the community is widely marketed, whereas if it is very close to the X axis (abscissa decides 0) it shows that the commodity is close to the average.

The results of the biplot show that the commodity marketed by Bali cattle in Simantri Gapoktan Badung Regency was a solid fertility, followed by expelled female Bali cattle, male Bali cattle seed, female cattle seed, and the smallest was the liquid fertilizer.

Discussion

Commodity, which is marketed by Bali cattle farms in Gargantuan in Simantri, Badung regency, Bali, the most is solid fertilizers, this is due to the production of solid fertilizer consisting of dirt and feed remnants which are the most products from Bali cattle farms. Tangkas and Julianah [7] reported that in Simantri, Seririt sub-district, Buleleng the rate of residual feed piles per day was 1.07 kg/cow/day and feces amounted to 7.28 kg/cow/day. The results of the commodity in the form of solid fertilizer seen from its marketing objectives are also quite extensive, which includes government, Gapoktan, farmers and other placers (ornamental plant traders, individuals and so on). This shows that the commodity of solid fertilizer is very helpful for the production of Bali cattle breeders in Gapoktan in Simantri, Badung regency, this is because the production is quite abundant, the collection is quite easy, the marketing is wide. Organic fertilizers produced from solid waste of cattle farms are of high economic value and can be utilized for rice farming land fertilizers, and plantation crops, the price is cheap and provides good results [8,9].

Liquid fertilizer is the most rarely marketed commodity, this is because Gapoktan members have not fully mastered the technology of

making liquid fertilizer made from cow's liquid (small water) manure, starting from the way of holding and processing liquid fertilizer. To process waste from cow's liquid waste into useful liquid fertilizer and the potential to become a commodity that can be marketed, a fermentation package is needed by involving the role of microorganisms to change or transform chemical compounds or organic substrates so that they can be implemented directly as nutrients in agricultural crops such as rice plants, vegetables, plantation crops In general, farmers do not know the complete technique of separating solid waste and liquid impurities, as well as the technique of fermentation into environmentally friendly organic liquid fertilizer [10].

Based on its form, organic fertilizer (organic fertilizer) derived from cow dung can be divided into two, namely liquid and solid (crumbs). The marketing of liquid fertilizer is mostly bought by farmers, this is due to the fact that liquid organic fertilizer (POC) is preferred farmers because it is practical and saves storage space. Praniti et al. [11] reported the advantages of organic fertilizer in the form of manure or compost and liquid fertilizer compared to inorganic fertilizers including improving soil texture, increasing soil pH, adding macro and micronutrients, increasing the presence of microorganisms in the soil, and does not cause environmental pollution. While the disadvantages are: the amount of fertilizer given is higher than inorganic fertilizer and the response of plants is slower. Therefore the government needs to find a way to increase the knowledge of the cattle breeders group at the Gapoktan in Simantri, Badung regency, Bali.

Expelled marketing of female Bali cattle and male Bali cattle seed were mostly carried out to collectors and animal markets, collectors usually made a profit by coming to cattle farmers and buying cows for resale to other farmers or other regions or to her wan slaughterhouses. Dungan et al. [12] reported that there were 3 channels formed from marketing institutions, namely marketing channel I (breeders/collectors-slaughterers), marketing channels II (farmers-brokers/collectors-wholesalers-butchers), marketing channels III (breeders-beauties/collectors-inter-island traders), the highest marketing occurs in channel II, the female of Bali cattle seed marketing is still very low and the marketing channels are partly to collectors or animal markets and farmers. The low marketing of female Bali cattle seeds to collectors or animal markets is due to the existence of Law No. 41 of 2014 in Article 18 that concerning the prohibition of cutting productive cows by the government. Prohibition of cutting productive female cattle aims to take anticipatory steps to prevent the extinction of the Bali cattle population in the future [13]. This prevention can be done by searching for female cattle that enter the slaughterhouse or are selected for parent cattle [14]. To maintain the Bali cattle population, more and more female cattle farms or nursery centers are needed, therefore the government's role in distributing female cow seeds is very necessary. this shows the role of the Rusdiana and Soeharsono governments stated that the Compulsory Bunting Cattle Parent Program (SIWAB) could realize the government's commitment to increase the beef cattle population and as a target for meat sufficiency in 2026. The program is believed to be able to deliver Indonesia to achieve beef self-sufficiency in the next 5-10 years. Government policies to increase the population of beef cattle in the short term can help meet beef consumption needs and in the long run have an impact on farmers' economic growth.

Conclusions and Recommendations

Conclusion

1. Purpose Marketing of the commodity produced by Gapoktan in Simantri Badung regency is collectors, animal markets, government, other Gapoktan, farmers and other places
2. The most produced erudite from Bali cattle farms in Simantri Gapoktan in Badung regency is solid fertilizer followed by rejected cattle, male Bali cow seedlings, female Bali cattle seedlings and the least is a liquid fertilizer
3. Reject cows and male cows are mostly marketed to collectors and animal markets, while female cattle are marketed to collectors and many animal markets are also purchased by farmers.
4. Solid fertilizer is marketed to other Gapoktan governments, other places, and farmers, while liquid fertilizer is mostly marketed to farmers.

Suggestion

1. To mobilize Bali cattle farms at Gargantuan in Simantri, Badung regency, the government needs to find market share or buy commodities produced by Gapoktan in Simantri Badung regency.

Acknowledgement

Sincerely thank you, Prof. Dr. Ir. Gede Rai Maya Temaja, M.P, as the chairman of Research and Community Service, and to Dr. drh. I Nengah Kerta Besung, MSI, Dean of the Faculty of Veterinary Medicine, Udayana University of Bali, for the facilities and funded this research.

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