

## **AN EFFECTIVE EXTENSION SYSTEM TO IMPROVE THE BEHAVIOR OF BALI CATTLE BREEDER IN BALI**

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A survey was carried out to determine the behavior of bali cattle breeders in Bali, as well as finding an effective extension system in implementing technic and management production. The research design was a survey, using a questionnaire as a data collection tool. Research was conducted in all eight regencies and one city in Bali. In total 198 breeders were surveyed by purposive sampling method, 99 of which were members of groups and 99 were not members of groups. Data was analyze using descriptive, t-test, and Structural Equation Model (SEM). Results of the research showed that: 1) The level behavior, bali cattle breeders in implementing technical and production management classified in the middle category; 2) The extension system in Bali for bali cattle breeders to improve the behavior was not effective; and 3) Effective extension system to improve bali cattle breeders behavior is extension conducted by a professional extension workers, with an innovative extension materials, reliable extension institution, and adequate extension financing, through a group approach. Based on the research results, it is suggested that: 1) the Government should to improve the professionalism of extension workers, innovative extension materials, forming reliable extension institution, and provide adequate extension financing; 2) Breeders is to become an active member of groups breeder.

Keywords: *breeders behavior, bali cattle, extension*

### **INTRODUCTION**

Bali is one of the important provinces in Indonesia, as a beef producer. Bali government supports the central government initiated project called Accelerated Beef Self-Sufficiency, to reduce beef imports, through increasing local cattle production. Bali cattle population grew only by 0.18% (from 632,927 to 637,459 cows) between 2007 and 2011 while central government target was 3,69%. It is argued that the target in Bali was not achieved mainly due to the failure in changing bali cattle breeders' behavior in implementing technic and management production to produce a good quality of bali cows (Ditjen Peternakan, 2010).

Improving the quality and quantity of bali cattle can be done if breeders have good attitude in implementing the technical and production management enterprises of the bali cattle breeding. Enhancement of bali cattle breeder behavior will occurred through an effective extension system approach. In line with Mardikanto (1993) who pointed out that extension is in the form of non-formal education for farmers and

their families in gaining knowledge and skills, changing their attitudes, and apply new innovations, as an effort to increase farm production, income and welfare. Therefore extension is important in the process of improving the productivity of farmers in their farm.

Until now, there was no data on effective extension systems in improving the behavior of bali cattle breeders to produce a good quality of bali cows. Improved quality of bali cows are expected to increase the population of bali cattle in Bali. Based on the above information, it is necessary to undertake the study on "An Effective Extension System to Improve Behavior of Bali Cattle Breeders in Bali"

### **Problem Formulation**

- 1) What is the behavior of bali cattle breeders in implementing technical and production management of bali cattle breeding?
- 2) How does the existing extension system in Bali in order to improve bali cattle breeders behavior in implementing technical and production management of bali cattle breeding?
- 3) How effective does the extension system to improve the behavior of bali cattle breeders in the technical and production management of bali cattle breeding?

### **Research Objectives**

- 1) To determine the behavior of bali cattle breeders in implementing technical and production management system of bali cattle breeding.
- 2) To determine the existing extension system in improving the behavior of bali cattle breeders in implementing technical and production management of bali cattle breeding.
- 3) Finding an effective extension system to improve bali cattle breeder behavior in implementing technical and production management of bali cattle breeding.

### **Hypothesis**

The hypothesis of this study is as follows:

- 1) Behavior levels of bali cattle breeders in implementing technical and production management of bali cattle breeding is in the low category.

- 2) Extension system to improve behavior of bali cattle breeders in implementing technical and production management of bali cattle breeding is not yet effective.
- 3) Effective extension system to improve the behavior of bali cattle breeders in implementing technical and production management of bali cattle breeding is an extension system that is supported by professional extension workers, reliable extension institutions, and adequate financing.

### **Benefits of the Research**

The results of this study will be beneficial to:

- 1) Academics aspect is to add to the of science, on the behavior of bali cattle breeders in implementing technical and production management of bali cattle breeding.
- 2) For the government in additional consideration in determining policy for the extension system that generates the behavior of bali cattle breeders to be come good breeders.
- 3) Entrepreneurship (bali cattle breeding) as a guideline to implement a good technical and production management of bali cattle breeding.

## **RESEARCH METHOD**

### **Research Design**

The study was conducted in all regencies and city in Bali, from January 2013 to March 2014. Research design is based on explanatory research, to describe the effect and cause-effect relationships among observed variables (Singarimbun, 1989). As a tools to collect data are used valid and reliable questionnaire. Quantitative and qualitative data was collected. The analysis is based on primary and secondary data.

### **Population and Sample**

Based on data from the Bali Provincial Livestock Service and Animal Health Office (2012), there are as many as 124 groups of bali cattle breeders, consisting of 116 are middle-class groups, and 8 groups are from the main class. Respondents were purposively chosen from those 124 groups of bali cattle breeders. In total 198 breeders, consisting of 99 breeder of group members bali cattle breeder, and 99 breeders who are not group members, were interviewed.

## Research Variables

The dependent variable is the behavior of breeders, doing effort in Bali cattle breeding (Y), consisted of technical behavior of production (Y<sub>1</sub>) and production management behavior (Y<sub>2</sub>). The independent variables consist of internal factors (F<sub>1</sub>) and external factors (F<sub>2</sub>). Internal factors include the characteristics of the Bali cattle breeder (X<sub>1</sub>), socio-economic conditions (X<sub>2</sub>), knowledge (X<sub>3</sub>), attitude (X<sub>4</sub>), skills (X<sub>5</sub>), perception (X<sub>6</sub>), and motivation (X<sub>7</sub>). While external factors (F<sub>2</sub>) includes: government policies in supporting the breeders behavior (X<sub>8</sub>), the implementation of livestock extension in Bali (X<sub>9</sub>), the public perception surrounding the Bali cattle breeding (X<sub>10</sub>), the cultural community in Bali cattle breeding (X<sub>11</sub>), access to the facilities livestock production (X<sub>12</sub>), the ease of getting credit for cattle business (X<sub>13</sub>), and the ease of product marketing (X<sub>14</sub>). Therefore, the behavior of Bali cattle breeders for breeding, is a function of internal factors and external factors Bali cattle breeders for breeding with the following models:

$$Y (Y_1 + Y_2) = F_1(X_1, X_2, \dots, X_7) + F_2(X_8, \dots, X_{14})$$

## Data analysis

Qualitative data were analyzed in percent (%) before conversion to quantitative data. Each variable was divided into five categories based on the percentage scores achieved by respondents: 20% - 36% (very low), 36% - 52% (low), 52% - 68% (medium), 68% - 84% (high), and <84% (very high). Data were analyzed descriptively (Black and Champion, 1999), by t-test (Steel and Torrie, 1991), and Structural Equation Model (SEM) according Ghozali (2004).

## RESULTS AND DISCUSSION

### Bali's Geography and Population

Bali is one of 33 provinces in Indonesia, located at 08<sup>0</sup>03'40"- 08<sup>0</sup>50'48" South Latitude and 114<sup>0</sup>25'53" - 15<sup>0</sup>42'40" East Longitude. As many as 3,572,831 people lived in Bali in 2011. A total of 556,615 people (25.245%) are working in the agricultural sector, with the second largest labor force after the tourism sector which occupies as many as 596,527 people (27.05%). It shows that, Bali is still very dependent on the agricultural sector (BPS. Prov. Bali, 2012).

## **Characteristics of Respondents**

Respondent characteristics include: age, formal education, non-formal education, and experience of breeders in Bali cattle breeding. The average age of respondents was 50.88 years (classified as productive age). Most of the respondents was senior high school (32.83%), 31.82% are elementary school graduates, 18.69% are junior high school graduates and 5.56% have a university degree. With respect to non-formal education, most respondents (60.61%) have never followed a course on Bali cattle breeding while some have as much as 1-2 times (39.39%). On average, Bali cattle breeders have 4.48 years of Bali cattle breeding experience. That means, the respondent has the potential for improved behavior in implementing the Bali cattle breeding efforts. These respondent characteristics are in accordance with the opinion of Mardikanto (1993) who states that, breeders behavioral changes are related to age, way of thinking and physical abilities. Furthermore, Donnelly (1996) states that, individual experiences contribute to shape perceptions and their behavior.

## **Respondents' Socio-economic Conditions**

Socio-economic condition of the respondents include: cattle ownership, land tenure, and number of family. On average, respondents own 3.93 cows, have 0.45 ha of land tenure and number of family as much as 4.68 persons. According to Munandar (1986) family is defined as the smallest social unit characterized by economic cooperation, to suffice the needs of households through farm productivity.

## **Breeders Behavior in Bali Cattle Breeding**

Bali cattle breeders behavior consists of the knowledge, attitudes, skills and implementation of technical and production management. Research results show that knowledge of Bali cattle breeders group members was significantly higher ( $P < 0.01$ ) compared to the knowledge breeders who are not members of the group (Table 1). Table 1 also shows that the attitude of breeders group members significantly more positive ( $P < 0.05$ ) compared with the attitude breeders who are not members of the group. Furthermore, the skills and application of technical and production management, members of the Bali cattle breeders was significantly higher ( $P < 0.01$ ) compared with the breeders are not members of the group.

Table 1  
Behavior of Bali Cattle Breeders in Bali.

No	Variables	Score (%) and Categories		t-value
		Group (AK)	Non Group (BAK)	
1	Knowledge	55.52 (middle)	45.88 (low)	3.61 <sup>**</sup> )
2	Attitude	84.20 (positive)	80.83 (positive)	1.99 <sup>*</sup> )
3	Skill	70.66 (high)	65.35 (medium)	2.62 <sup>**</sup> )
4	Application	63.16 (medium)	51.74 (low)	3,00 <sup>**</sup> )

Description:

AK: group member, BAK: non group member,

\*): significant ( $p < 0,05$ ) t-table: 1,960; \*\*): significant ( $p < 0,01$ ) t-table 2,576

The study concluded that, where group members of Bali cattle breeders behavior are better than non group members. This means that group approach is very important in improving the effectiveness of the extension. This is in line with Mardikanto (1993) who emphasizes that knowledge, attitudes, skills, and implementation techniques and production management can be improved through the extension process. Suparno (2001) further stated that in order to improve one's ability to achieve the goals, it is necessary to obtain knowledge and skills.

### **Extension System in Bali**

Extension system associated with Bali cattle breeding, were observed based on three components namely 1) institutional extension, 2) extension workers, and 3) the financial extension support. If any of these three components is not functioning properly, Bali cattle breeding extension will not be well implemented.

#### **1) Institutional of Extension**

Referring to the Act No. 16 of 2006, the Bali Provincial Government and district/ cities government in Bali should establish institutional extension from the provincial level down to the village level. However such extension institution has not yet been established. This is meant that there was no Extension Coordinating Board in the provincial level which effectively coordinates extension institutions. From the eight regencies and capital city of Bali, only Tabanan regency has an Extension Executive Agency as mandated in the Rule of the Republic of Indonesia No. 16, 2006. Only 52 districts from the total 57 districts in Bali, have an extension system

yet with various condition and forms of institution. In term of quality of extension services, number of extension worker, and extension facilities. In Tabanan these Institutional extensions are called Extension Center for Agriculture, Fisheries and Forestry while in other part of Bali these institutions are known as Agricultural Extension Centers. However, extension function of these institutions is not optimal, as for example, none of the Agricultural Extension Centers were given a special task for the specific development of bali cattle breeding farms. Furthermore, of the 710 villages in Bali, until now, none of the villages has a Village Extension Services Unit.

## **2) Extension Worker**

Extension workers were observed in terms of number and distribution of agricultural extension worker, in each region and how agricultural extension worker give extension to farmers relating to the effort of bali cattle breeding. In term of the number of extension workers in Bali, at the beginning of January 2013, there are 660 extension workers who are government worker and 194 persons who have an extension worker contract, which amounts to 854 extension workers in total. The 854 extension workers are on duty at the provincial, regency, sub-districts and villages levels. There are 22 persons working at the provincial level, while at the regency and sub-district is varies. For example Buleleng Regency had 108 extension workers in 2013, of which 9 were on duty at the regency level, and 25 extension workers at the sub-districts level (Distan. Prov. Bali, 2013). Thus the number of extension workers assigned at the village level is a total of 74 persons who in-charge to service of 148 villages in Buleleng Regency In other words two villages were handled by only one extension worker. These conditions are not in accordance with government policy on village extension which stipulates that ideally for agricultural programs to be successful, each village must have its own extension worker (Cucuk, 2008; Isran, 2012). Similar conditions are found in almost all districts in Bali, so the extension becomes less effective.

## **3) Funding for Extension**

Fund for extension services is regulated by Central Government (Regulation No. 43 of 2009) on the Financing, Development and Supervision of Agricultural Extension, Fisheries, and Forestry. In the Government regulation it is stipulated that

the financing of extension must be based on extension institutions under Law No. 16 of 2006. Low level budget implementation of extension in Bali, especially in supporting implementation of breeding cattle farms, should be addressed by forming an institutional extension based on the mandate of No. 16 rule in the year 2006, and the Regulation No. 40 of 2006 and Central Government Regulation No. 43 of 2009 which can be implemented in Bali. If the Bali provincial government and regency/city government does not carry out the mandate of Act No. 16 of 2006, the implementation of extension in Bali, specifically in support of cattle breeding, such efforts would be very difficult to achieve. These conditions indicate that the implementation of extension of the Bali cattle breeding farms have not been goes well and effectively. In line with Mulyono (2010), which states that the purpose of extension is to change the knowledge, attitudes, and skills toward the goal of better farming systems, better economic of farmer (better economic), better the standard of farmer life (better living), better public relationship (better community) and better environment.

### **Effective Extension System.**

An effective extension system to improve the behavior of farmers can be formulated based on the factors that influence behavior. Bali cattle breeders behavior (Y) consists of the technical behavior of production ( $Y_1$ ) and behavioral management of production ( $Y_2$ ). Bali cattle breeders behavior, influenced, significant positive effect ( $P < 0.05$ ) by internal factors ( $F_1$ ) with a regression coefficient is 2.637 and the significant negative effect ( $P < 0.10$ ) by an external factor ( $F_2$ ) with a regression coefficient of -4.806. Internal factors consist of: socio-economic conditions of breeders ( $X_2$ ) includes: livestock ownership, land ownership and number of family; attitude of breeders ( $X_4$ ); skills of breeders ( $X_5$ ); and perceptions of breeders ( $X_6$ ).

This means that, the more positive attitude, the higher skill, and the more positive perception is more economically advantageous, which results in improved behavior of farmers in implementing bali cattle breeding. This is in accordance with the opinion of Rogers and Shoemaker (1971) who noted that new ideas are quickly accepted if these are beneficial to the farmer. Munandar (1986) highlights the number of dependents of the family, that the more family number, will encourage the



efforts to meet the needs of the family. Kartasapoetra (1987) declared that, increasingly area of land managed by farmers, will be higher the urge to cultivate it.

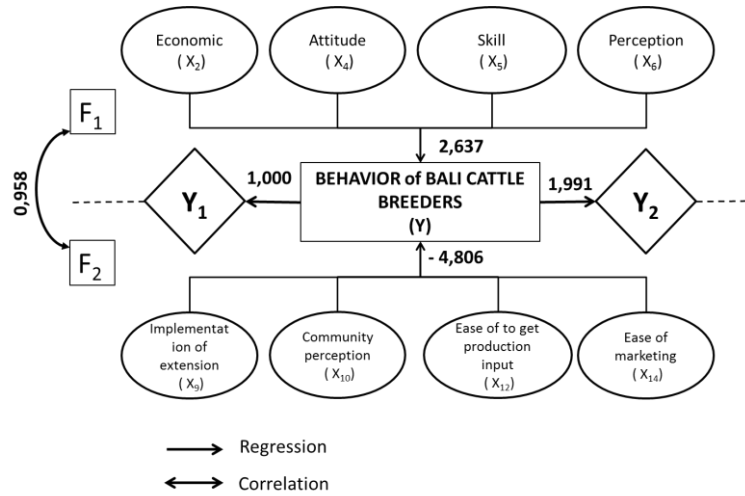


Figure 2

### Factors that Influence the Behavior of Bali Cattle Breeders

External factors (F<sub>2</sub>) which synergistically significant negative effect on the breeding behavior of bali cattle breeders in implementing technical and production management, consists of: the implementation of the extension in Bali (X<sub>9</sub>), public perception around (X<sub>10</sub>), the ease of getting input production (X<sub>12</sub>), and ease of in marketing of products (X<sub>14</sub>). This means that, the more extension is provided, the better public perception, the easier in getting cattle production facilities and easier to market the livestock, then the behavior of farmers in implementing technical and production management of bali cattle breeding farms is progressively decreasing. These conditions because of the extension workers were not trusted by the breeders.

Extension workers are perceived as not sufficiently professional. Material provided by extension workers is insufficient and does not contain any innovative new ideas and technologies to improve breeding techniques. Public perception cannot improve the behavior of farmers, because breeders have more confidence in their own decisions. Ease of getting cattle production facilities, like concentrates also does not help to improve the behavior of farmers, because the price is less profitable for farmers. Ease of marketing produce cannot improve the behavior of farmers, because there is no certainty of price. Accordingly, breeders have no incentive to

keep more of cattle. Wiguna (2014), highlighted the importance of extension workers to be professional and extension materials to be innovative.

Based on these results, an effective extension system can be formulated to improve bali cattle breeders behavior. Figure 2 illustrates an effective extension system in which extension professionals are supported by two sub-systems: (1) education and training; and (2) standardization and work procedures. In addition, innovative extension materials are a result of the sub-system of research and technological development, such as institutional research and assessment technology for cattle breeding. All three sub-systems require adequate financing to support an effective extension system.

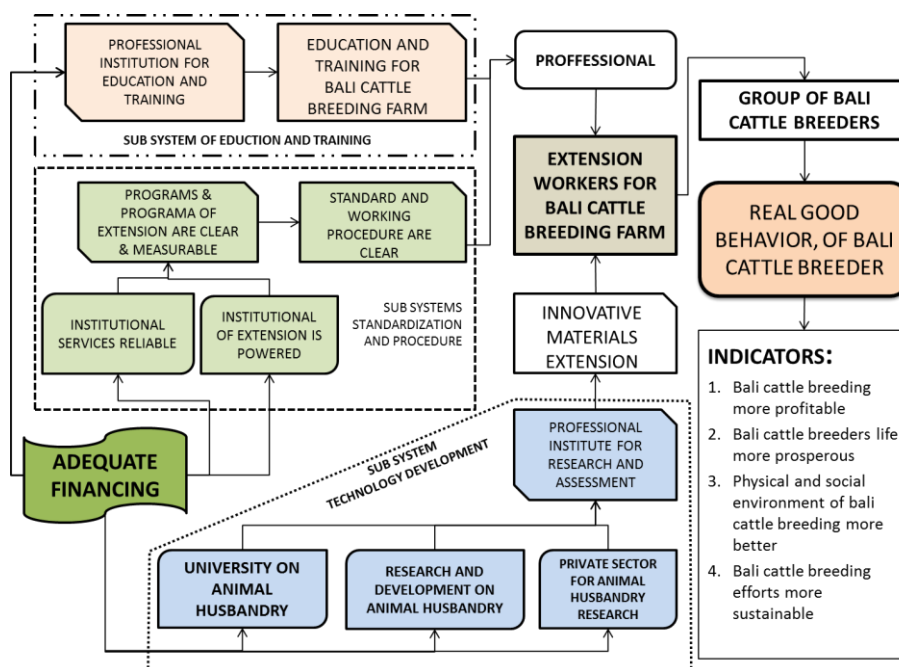


Figure 2:  
Effective Extension System to Improve Bali Cattle Breeder Behavior

### General Discussion and Implications

Through the extension by an extension workers, the attitude of breeders towards bali cattle breeding efforts, will be improved. Behavior of breeders in implementing the technical and production management of bali cattle breeding will also improve. The developed extension must be able to convince breeders, that cattle breeding business is able to increase prosperity of breeders. Thus breeders will have a positive attitude which will also improve behavior, especially in the

implementation of technical and management production. In line with Samsudin (1987) and Mardikanto (1993), who stated that the purpose of extension is to change the target behavior, from not knowing to knowing, from disagreement to agreement, and from being unskilled to being skilled, and to fully implement an innovation. As a result of improved behavior, the productivity and incomes will increase, and livelihoods become better.

External factors that negatively affect the behavior of farmers need to get the attention of the government because the current extension workers are hardly trusted by breeders. Public perception, ease of getting cattle production facilities and marketing of produce alone cannot fix the behavior of farmers, because breeders felt no incentive to change given a decent profit. Therefore, extension must be based on innovative materials, which brings change and which is market-oriented, so as to provide benefits to breeders and developed constantly.

In addition to being professional, extension workers need to follow standards and procedures which are clear and measurable. They should also have the knowledge and skills that are appropriate to the needs of the Bali cattle breeders. Extension workers should be able to assist farmers in making a profitable cattle business, increase income and welfare. Professional extension agents should also be able to assist in developing environmentally friendly cattle breeders' businesses. According to Mulyono (2010) the purpose of extension is to change the knowledge, attitudes, and skills targeted for better farming systems (better farming), better farmer economic, better of farmers life (better living), better public relations (better community) and better environment.

The results of the research show that external factors synergistically affect the breeding behavior of Bali cattle breeders. Related to these findings, the effective extension system to improve Bali cattle breeders' behavior is a system extension that basically refers to Act No. 16 year 2006. An effective extension system to improve Bali cattle breeder behavior in implementing technical and production management is extension by professional extension workers, with innovative extension materials. The effectiveness of the extension system is warranted through synergies between the education and training sub-system, the standardization and work procedures sub-

system and the sub-system of research and technology assessment. All three sub-systems must be supported by adequate funding.

It was concluded that the behavior of breeders in implementing technical and production management of Bali cattle breeding in Bali was medium category. The existing extension system in Bali to improve Bali cattle breeders behavior in implementing technical and production management had not effective yet. An effective extension system to improve Bali cattle breeder behavior in implementing technical and production management were professional extension workers with innovative extension material. The effectiveness of the extension system was warranted through synergic collaboration between the education and training sub-system, the standardization and work procedures sub-system and the sub-system of research and technology assessment. All the three sub-systems must be supported by adequate funding. The government must improve the professionalism of the extension workers, innovative extension materials, forming reliable extension institution, and provide adequate extension funding, besides the Bali cattle breeders should become active member in groups breeder.

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