

EFFECTIVENESS OF *SIMANTRI* APPLICATION AND ITS ENFLUENCE ON THE IMPROVEMENT OF FARMER'S INCOME IN BALI

Agus Maha Putra Sanjaya, I Nyoman Suparta, I. Gst. Lanang Oka, I.B. Gaga Partama

ABSTRACT

A survey was carried out to analyze the effectiveness level of *Simantri* application and the effectiveness of *Simantri* application on increasing farmer's income. Structured questionnaires were used to obtain information from 138 respondents consisting of chairmans, secretaries, and treasurers of forty-six groups of *Simantri* from 2009-2010. The groups of *Simantri* selected by purposive sampling method. Data obtained were analyzed by descriptive method and statistic analysis. Results indicated that : less than a quarter of respondents (23.92%) effective in *Simantri* application, while 105 respondents (76.08%) was less effective. Effectiveness of *Simantri* application improved farmer's income in Bali.

INTRODUCTION

Agriculture in Bali is dominated by a large number of smallholders with scattered and fragmented holdings. Extensive land arable farmer's on average 0,34 ha (Budiasa, 2011). Lack of adequate capital for investment, low interest in agribusiness, as well as traditional management are the main factors affecting (Utomo, *et al.*, 1999). High risk and uncertainty in agricultural business, especially regarding on high-value of the commodities, adoption of farming system that integrates crop livestock production and agro-forestry become an important strategy to overcome the difficulties.

Regional Government created a new concept to improve agricultural sector of Bali in 2009 through *Simantri* program (Integrated Farming System) which was adopted from the model of *Prima Tani*. *Simantri* program funded approximately 200 million rupiahs in the form of social assistance to each *Simantri* group. The advantages of integrated farming system (IFS) include pooling and sharing of resources, efficient in using family labor, conservation, preservation and utilization of farm biomass including non-conventional feed and fodder resources, effective use of manure (animal waste), regulation of soil fertility and health, income and employment generation for many people and increase economic resources. The IFS is part of the strategy to ensure sustainable use of the natural resources for the benefit of present and future generations (Preston, 2000). There are three main functions performed by the crop-livestock integration model, that is: (a) improve the welfare of farmer's and stimulate economic growth, (b) strengthen local food security, and (c) maintain environmental sustainability (Sudaratmaja, 2009). Crop-livestock integrated system is the application of an integrated farming approach through the concept of low external input. This system could improved farmer's income (Sariubang, *et al.*, 2003; Suwandi, 2005; Priyanti, 2007).

Performance of a program is determined by level of effectiveness and efficiency of the program in achieving its goals or objectives. Yusuf (2004) suggested the effectiveness is a condition that indicates the level of success of management activities, in achieving the goals set in advance and should also measure its efficiency. In any discussion of effectiveness, it will not be released from efficiency. Efficiency is a measure that indicates how well the

economic resources used in the production process to produce output (Gaspersz, 2000). According to Soekartawi (2003) efficiency is a term that generally means the ratio between the output and input or the ability to work effectively with fixed capital input or attempt to use the minimum input to get the output (production). The effectiveness of the program is assessed from the success and efficiency in implementing *Simantri*. The effectiveness of *Simantri* is expected to increase farmer's income.

Simantri program has been running about four years, but there are still many problems must be encountered in the application of this program. There is a gap between the intent and purpose of the activity with the fact *Simantri* group current conditions. Improvement of farmer's income will be influenced by the effectiveness of the application of this program. Based on these issues, the aims of this study were to analyze the effectiveness of *Simantri* application and its effect on increasing farmer's income.

MATERIAL AND METHODS

The research was conducted in eight regencies and one city of Bali. There are 16 groups of *Simantri* in Buleleng regency, 3 groups in Jembrana, Tabanan, Badung and Gianyar, 2 groups in Klungkung, 7 groups in Bangli, 8 groups in Karangasem, and 1 group in Denpasar. The groups of *Simantri* were determined by purposive sampling method. Total respondents were 138 consisted of chairmans, secretaries, and treasurers of forty-six groups of *Simantri* from 2009-2010. Source of data consisted of primary and secondary data. The qualitative and quantitative data were collected directly and followed by in-depth interview, observation, and documentation. Data were analysed statistically and by descriptive method. Descriptive method was used for interpretation the effectiveness of *Simantri* application, meanwhile statistical analysis was used to analyse the influence of effectiveness of *Simantri* application in increasing farmer's income by PLS (partial least square) with Smart PLS software version 2.0. Determination of the effectiveness of *Simantri* categories (successful application and *Simantri* efficiency) were measured based on the scores achieved by respondents using the formula "interval class" that is dividing the difference between the highest and lowest values with the number of categories (Dajan, 1986). The mean scores were used for rating the fifteenth *Simantri* indicators of success achieved by respondents from each indicator. The fifteenth *Simantri* indicators of success are : (1) Increase in quantity and quality of agriculture, livestock, and fisheries; (2) the availability of feed quality throughout the year; (3) development of institution and human resources in agriculture and farmer's; (4) creation of employment opportunities through the development of agricultural diversities and home industry; (5) development of intensification and extension of farming; (6) increase farming system insentives through increase of production and efficiency of farming (fertilizer, feed, biogas, bio urine, and bio pesticide); (7) created and development of organic agriculture (green economic); (8) development of business institutions in the rural economy; (9) increase farmer's income (at least 100 percent), (10) development of rural infrastructure; (11) transfer of technology especially for integrated agriculture such as *Simantri* farmer's organization; (12) increase the population of Bali cattle by minimize their mortality; (13) reduction of production costs in farming systems derived from outside the system; (14) creation of zero

waste farming concept; (15) absorption of livestock products, agricultural and processed cattle waste in the market.

Effectiveness analysis results are presented in descriptive form. Meanwhile, *Simantri* efficiency measured by comparing input and output ratio at farming business. Analysis of improvement of farmer's income in Bali was carried out to measure the improvement of farmer's income using the following formula :

$$\text{IFI} = \frac{\text{EIAS}}{\text{IBS}}$$

Where :

IFI : Improvement of farmer's income

EIAS : Extra Income after following the *Simantri* program

IBS : Income before following the *Simantri* program

RESULT AND DISCUSSION

Less than a quarter of respondent (23.92%) were effective in *Simantri* application and 105 respondent (76.08%) were less effective (Table 1). This result caused by most of the respondents were less successful and less efficient in *Simantri* application.

Table 1 : Effectiveness of *Simantri* Application

No	Variable	Attainment score	Variable Category	No of Respondent	Percentage (%)
1	Effectiveness of <i>Simantri</i> application	> 4.2 – 5	Very effective	12	8.70
		> 3.4 – 4.2	Effektive	21	15.22
		> 2.6 – 3.4	Less effektive	105	76.08
		> 1.8 – 2.6	Ineffective	0	0
		1 – 1.8	Very ineffective	0	0
Total				138	100
2	Successful application of <i>Simantri</i>	> 4.2 – 5	Very Success	12	8.70
		> 3.4 – 4.2	Success	21	15.22
		> 2.6 – 3.4	Less success	105	76.08
		> 1.8 – 2.6	Insucces	0	0
		1 – 1.8	Fail	0	0
Total				138	100
3	<i>Simantri</i> efficiency	> 4.2 – 5	Very efficient	12	8.70
		> 3.4 – 4.2	Efficient	21	15.22
		> 2.6 – 3.4	Less efficient	105	76.08
		> 1.8 – 2.6	Inefficient	0	0
		1 – 1.8	Very inefficient	0	0
Total				138	100

Seven indicators on the top rating is an indicator which success to achieved by the respondents with attainment mean scores range from 3.797 up to 3.490. This result show the counselling activity succeed enough to be done by the *Simantri* extension agent in order to stimulate adoption of integrated farming system which limited on farm activity, food crop, and also marketing of the agricultural product. The adoption represented result from communications process started from innovation forwarding up to changes of target behavior (Mardikanto,1988). Meanwhile, eight other indicators were less successful to be achieved by respondents with mean scores range from 3.328 up to 2.683. This condition occurs because

the majority of respondents did not keep their heifers in the *Simantri* colony pen every day; did not process their food crop waste for cattle feed and cattle waste as compost, biogas, and biourine; their many of the road infrastructure to the *Simantri* location were badly damaged. These results showed that, on average *Simantri* program application by the respondents were less successful or still far from achieving the goals. Rating of *Simantri* indicators of success shown in Table 2.

Table 2 : The Succession of *Simantri* Program

Rating	Indicators of <i>Simantri</i> Succession	Mean Score
1.	Transfer of technology especially for integrated agriculture such as <i>Simantri</i> farmer's organization	3.797
2.	Increase the population of Bali cattle by minimize their mortality	3.760
3.	Development of business institutions in the rural economy	3.715
4.	Absorption of livestock products, agricultural and processed cattle waste in the market	3.711
5.	Increase in quantity and quality of agriculture	3.539
6.	Increase farming system insentives through increase of production and efficiency of farming (fertilizer, feed, biogas, bio urine, and bio pesticide)	3.497
7.	Reduction of production costs in farming systems derived from outside the system	3.490
8.	Development of rural infrastructure	3.328
9.	Development of institution and human resources in agriculture and farmer's	3.292
10.	The availability of feed quality throughout the year	3.281
11.	Development of intensification and extension of farming	3.263
12.	Created and development of organic agriculture (green economic)	3.121
13.	Creation of zero waste farming concept	3.115
14.	Increase farmer's income (at least 100 percent)	2.964
15.	Creation of employment opportunities through the development of agricultural diversities and home industry	2.683

Influence of independent variables on dependent variables

Testing the effect of independent variables on the dependent variable was conducted with t-test at each direct influence path by parsial. Result of validity test of path coefficient in each path for direct influence can be seen at Tables 3.

Table 3 : Result Of Direct Effect Tested

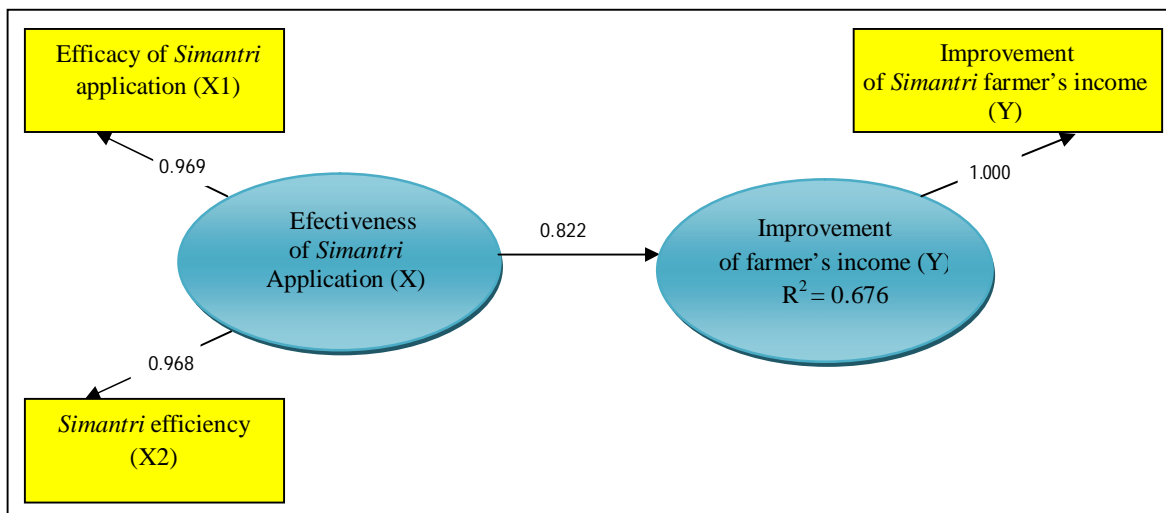
No	Relation Between Variable	Path Coefficient (Bootsrapping)	t-statistic Value	Boldness
1	Efectiveness of <i>Simantri</i> application (X) → Improvement of farmer's income (Y)	0.821	23.337	Significant

Efectiveness of *Simantri* application (X) had a significant and positive effect on improvement of farmer's income (Y) since this result showed a positive valuable of 0.821 path coefficient with t-statistic equal to 23.337 (> 1.96). This result suggests that the effectiveness value of *Simantri* application may increase the farmer's.

As explained previously, less effective of *Simantri* application by majority of respondents because of farmer's did not keep their heifers in the *Simantri* colony pen every day. This condition caused the solid and liquid waste from cattle can not be processed optimally into compost and biourine. Therefore, this condition reduced farmer's income. Moreover, crop waste product did not be processed for cattle feed also cause less effective of *Simantri* application. Suryanti (2011) reporting that technological adoption tend to be better at crop and livestock technology then the adoption of cattle waste processing technologies. So far this indicates that the integrated farming system (*Simantri* model) has not been able to take the benefit from crop waste and livestock waste as sources of income in agricultural business.

Result of this research showed that farmer's must applying third business unit of *Simantri* effectively to improve farmer's income. Effective means fifteenth of *Simantri* success indicators have to be reached, beside reducing production cost from outside farming and increasing the output (product). Farmer's have to improve their skills through technical tuition, training, and counselling to third business unit of *Simantri* management in order to improve *Simantri* application. According to result of testing the effect of independent variables on the dependent variable which have been elaborated above, path diagram (Diagram 1) below shows direct effect of relation between variables.

Diagram 1 : Path Diagram of Direct Effect Relationship Between Variables



Improvement of Farmer's Income

Farmer's income is the amount of benefits received by farmer's which is calculated based on the value of production minus all expenditures that are used for production. The level of farmer's income is depending on the type and size of farm and livestock managed by the farmer's. Bali regional government expected that *Simantri* program can increase the income of farmer's up to 100% (twice) in 4-5 years.

In this research the improvement of farmer's income was assessed by comparing the income from three business units *Simantri* with incomes before they following the program. The classification of respondents based on how much they earned improvement income after following *Simantri*. The improvement of farmer's income can be seen in Table 4.

Tabel 4. Income Improvement After Following The *Simantri* Program

No	Magnitude of Income Improvement (%)	Average Income Before Following <i>Simantri</i> Program (Per Month)					Average Extra Income After Following <i>Simantri</i> (Per Month)								No of Respondent		No of <i>Simantri</i> Group		Characteristics of <i>Simantri</i> Group	
		Food Crops		Livestock		Total	Food Crops		Heifers from <i>Simantri</i> Package		Cattle Waste Processing									Total
											Without Purchasing Cattle Waste From Outside		Purchasing Cattle Waste From Outside							
		Rp (000)	%	Rp (000)	%	Rp (000)	Rp (000)	%	Rp (000)	%	Rp (000)	%	Rp (000)	%	Rp (000)	Number	%	Number		%
1	> 100	2,607	85.52	446	14.48	3,053	573	6.64	375	4.35	1,072	12.43	6,600	76.58	8,620	12	8.70	4	8.70	1. Bali heifers always in <i>Simantri</i> colony pen. 2. Cattle waste optimally processed into compost, biourine, and biogas. Even buy cow manure and other constituent materials from outside.. 3. Compost production capacity up to 120 tons/month. 4. Average income improvement reaches 282%.
2.	> 75 – 100	3,069	89.44	367	10.56	3,436	1,287	47.23	408	14.97	1,030	37.80	-	-	2,725	9	6.52	3	6.52	1. Bali heifers always in <i>Simantri</i> colony pen. 2. Cattle waste optimally processed into compost, biourine, and biogas. 3. Compost production capacity up to >10 tons/month. 4. Average income improvement reaches 79.30%.
3.	> 50 – 75	2,900	87.88	380	12.12	3,280	973	48.91	338	16.99	678	34.10	-	-	1,989	12	8.70	4	8.70	1. Bali heifers always in <i>Simantri</i> colony pen. 2. Cattle waste optimally processed into compost, biourine, and biogas. 3. Compost production capacity about 6-8 tons/month. 4. Average income improvement reaches 60.64%.
4.	>25 – 50	3,585	90.08	380	9.92	3,965	897	60.32	340	22.86	250	16.82	-	-	1,487	93	67.38	31	67.38	1. Bali heifers is not always in <i>Simantri</i> colony pen. 2. Cattle waste is not optimally processed into compost, biourine, and biogas. 3. Compost production capacity about 1-4 tons/month. 4. Average income improvement reaches 37.50%.
5.	1 - 25	2,560	86.19	410	13.81	2,970	110	25.58	320	74.42	-	-	-	-	430	12	8.70	4	8.70	1. Only one <i>Simantri</i> group keep their heifers in the <i>Simantri</i> colony pen every day, while the three other <i>Simantri</i> group were not. 2. Cattle waste not at all processed into compost, biourine, and biogas. 3. Average income improvement reaches 14.47%.
															138	100	46	100		

Only *Simantri* group capable of producing compost with a production capacity of 120 tons/month is able to increase income from *Simantri* program more than two times (nearly three times). *Simantri* group that implement the program properly could increase their income between 60.64% - 79.30%. The *Simantri* group who did not always keep their heifers in the *Simantri* colony pen and cattle waste did not optimally be processed, only earned an average of income improvement about 37.50%, Whilst for the *Simantri* group who did not process cattle waste into compost, biourine, and biogas, only earned an average of income improvement about 14.47%.

Table 4 shows that most of the respondents (67.38%) obtain improvement of their income after following *Simantri* about 37.50% of revenue before following *Simantri*. This value is still smaller than value was obtain from Sudaratmaja research. Sudaratmaja, *et al.* (2004) stated that the CLS models are applied to farmer's in Bali, proved to be able to save on fertilizer expenses by 25.2% and increase farmer's income by 41.4%. This is quite logical because most *Simantri* group did not be keep their heifers in the *Simantri* colony pen all the time and cattle waste was not optimally be processed into compost, biogas and biourine. However, all respondents (members of *Simantri* group) obtained improvement of their income from applying the *Simantri* program.

CONCLUSION

It could be concluded that less than a quarter of respondents (23.92%) effective in *Simantri* application, and (76.08%) were less effective. However, farmer's who applied *Simantri* program effectively might improve their income.

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