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## **Strategy Formulation of Empowering Farmers Capability at Integrated Farming of Beef Cattle and Paddy Base on Zero Waste: Analytical Hierarchy Process Approach**

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### **Abstract**

The study aims to formulate a strategy for strengthening the farmers in the adoption of technology for the development of integrated beef cattle with paddy. Research was conducted in Pinrang South Sulawesi province for seven months. Primary Data obtained by using questionnaires, interviews and focus group discussion. In this study also was involved expert respondents. Flow implementation strategy formulation is done using analytical hierarchy process (AHP) techniques. The results showed that to increased optimally capacity of paddy straw processing technologies dairy farmers as feed technology for implementation strategies required waste treatment at the level of the farmers (weighting 0,558). Increased capacity of the farmers in cow waste processing technology as fertilizer can be achieved by applying a strategy of increased knowledge and skills of extension officers in sewage treatment technology (weighting 0,443). In order to increase achievement farmers cow waste processing technology as biogas and development material/methods extension technology based on the needs of ranchers was required a strategy in providing of facilities and infrastructure supporting the application of the technology of sewage treatment (weighted 0.590 and 0,517).

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**Keywords:** Spatial mapping, sustainable and competitive tourism, lake conservation, north sulawesi

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## Introduction

Integration of beef cattle with paddy is the best strategy to improve the optimization of resource utilization of agricultural waste. But the effort has not been implemented properly, because its implementation is still done on a partial, not integrated and holistic.

The main component of technology that need to be controlled by farmers in farming systems especially integrated system of beef cattle and paddy waste treatment technology of processing technology of paddy straw as feed, livestock waste processing technology as biogas (Syamsu, 2011).

Abdullah and Syamsu (2008), mentioned that the development pattern of the integration of livestock and paddy, its success was determined by the capacity resources of the farmers.

The capacity development of the farmers implemented by growing awareness of the farmers, where all the activity in the development of livestock such as beef cattle was done from, by and for the farmers.

Development of the farmers implemented with participatory approach so that the principle of equality, transparency, responsibility, accountability and cooperation are main factors in empowering of farmers.

Capacity limitations and capabilities owned by farmers such as limitations in terms of knowledge, skills, capital/expense for the use of the technology, the technology does not

have the power or compatibility with Adaptive area and socio-cultural conditions, advantages value added obtained relatively fewer farmers when the technology is adopted, some of the causes of low farm technology adoption by farmers.

To that end, the role of technology in the development of the integration of beef cattle and paddy is very important which is supported by a high level of adoption of technology in order to improve the productivity of livestock farming is beef cattle and paddy.

Factors determine the success utilization of waste cattle as fertilizer and rice straw as fodder is kapasistas farmers in terms of attitude, knowledge and skill. For that purpose this research to formulate strategy to increase the capacity farmers in adopting technology for development beef cattle which integrated with paddy.

## Method

Research was carried out in Pinrang South Sulawesi province, Indonesia for seven months. Primary Data obtained using data collection techniques by using questionnaires, interviews and focus group discussion, the discussion group with farmers to identify the problems in developing cattle and paddy business.

In this study also was involved an expert respondents. Experts can come from other areas as election was prioritized on experts/practitioners who have expertise or

experience, reputation and on aspects related to this research.

Flow implementation strategy formulation was conducted using analytical hierarchy process (AHP) techniques according to Saaty (1993). Generally, in this study, there were three stages of the formulation of the strategy of strengthening the capacity of farmers in the adoption of technology for the development of an integrated beef cattle with paddy those are:

- a) The decomposition. In drawing up the priorities, then the problem should be able to in the decomposition of a goal/target (goal) of an activity, the identification of the options (options), and the formulation of criteria (criteria) to choose priorities.
- b) Assessment and comparison of the elements. After the problems was decomposed, then there were a two-stage assessment or compare between elements of the comparison between the criteria and the comparison between options for each criterion. Comparison between the criteria intended to determine weights for each of the criteria. On the other hand, the comparison between options for each criterion. In other words, this assessment was intended to see how important the choice of certain criteria.
- c) The synthesis assessment. Synthesis of the results was the final stage of the AHP. Basically, this synthesis was the summation of the weights obtained every option on each criterion after being given the weighting of such criteria. In this study, the results comparison of pairs were done by an expert, the synthesis of the assessment carried out

using software namely Criteria Decision Plus (Marimin, 2004) that assist and speed up the completion of the synthesis of the assessment has been carried out in the assessment of the comparative matrix pairs.

## Results and discussion

Based on the results of the interviews and focus group discussion with experts that farmers, agricultural extension officers, the Department of animal husbandry, researchers and academics, then formulated the preparation of decomposed priority be the goal/target (goal) of an activity, the identification of the options (options), and the formulation of criteria (criteria) to choose priorities. In this research the goal was strengthening the capacity of farmers in the adoption of technology for the development of an integrated beef cattle with paddy.

After the target was set, the next step was to determine which criteria/deciding factor strengthening the capacity of farmers in the adoption of technology, as follows. Research results based on expert opinions set out the deciding factor: a) Characteristics of socio psychological farmers, b the socio-economic characteristics) of the farmers, c) characteristics of technological innovation, d) the capacity of farmers in farming paddy, e) farmers capacity in cows farming business, as well as f) performance of extension officers.

Formulated actor or who lodges in the capacity strengthening farmers in adopting technology for development beef cattle which integrated with paddy such as a) Farmers, b)

Private businessmen c) The government or the related agency, d ) Extension agent e) College or research institutions and research and development.

In the capacity of strengthening farmers in adopting technology for development beef cattle, which was integrated with paddy not separated from purpose to be achieved. Some purpose to be achieved in the capacity strengthening farmers in adopting technology were a) Capacity improvement farmers technology processing of paddy straw as feed, b) Capacity improvement farmers technology of feces/urine treatment as a fertilizer, c) Capacity improvement farmers technology feces/urine treatment as biogas, d) Development material / counseling method technology based on the needs of farmers, and e) Improved performance of extension agent in mentoring farmers for adoption of waste treatment technology.

Then set some of the strategies that will be used in achieving the objectives that have been set. Some strategies were formulated which were a) Applied technology optimally in the sewage treatment at farmers level, b) The provision of facilities and infrastructure supporting the application of waste treatment technologies, as well as c) Increased knowledge and skills of extension officers in waste treatment technology. Based on the decomposition of which has been described above, the hierarchy method was built as in Figure 1.

In this study, a comparison of paired assessment conducted by the experts, the

synthesis of the assessment carried out using software namely Criterium Decision Plus, which helps accelerate the completion of the synthesis and assessment has been done in the assessment of the comparative matrix pairs.

Synthesis assessment results in strengthening the capacity of farmers to the adoption of technology in the development of an integrated beef cattle with grain that the deciding factor strengthening the capacity of farmers to the adoption of technology in the development of an integrated beef cattle with grain obtained that the performance extension officers are the highest impact factors in strengthening the capacity of farmers to adopt technology with weights 0,327, further characterizing the socio psychological farmers 0,194, as well as the capacity of farmers in cow farming business and farmer capacity in farming of paddy with the same weighting 0,148.

On the other hand, comparison of the importance of factors with an actor/performer, showed that the factor characteristics socio-phsycology, characteristic socio economic farmers and farmers determined by peasant farmers (0.515 and 0,473 weights).

This means that for the development of psychological and socio-economic characteristics of the farmers in the framework of strengthening the capacity of the farmers was determined by the farmers themselves who should be trying to increase

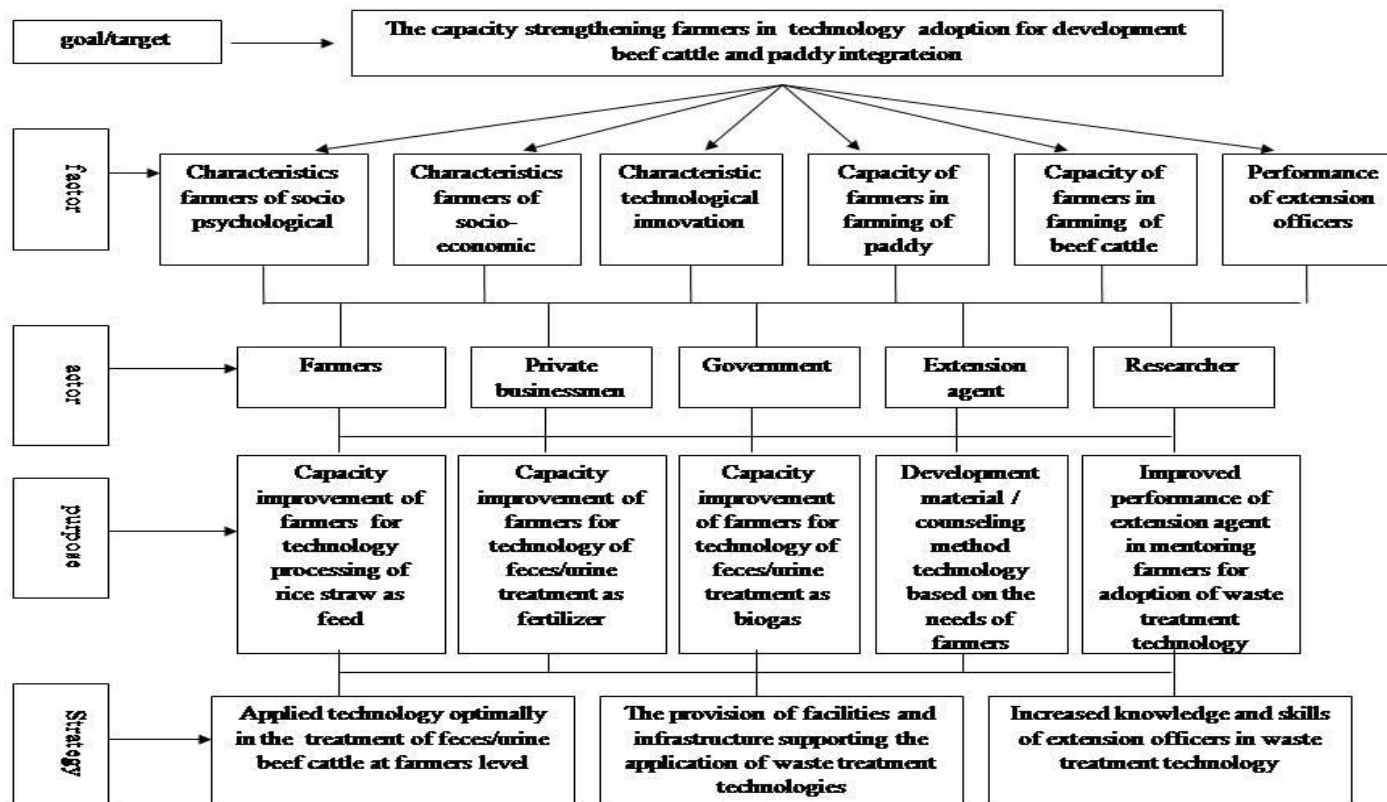


Figure 1: Analytical hierarchy structure of the strategy of strengthening the capacity of farmers in the adoption of technology for the development of an integrated beef cattle with paddy

the capacity of knowledge and skills. Determinants of the characteristics of the innovation in strengthening the capacity of farmers, actor/performer who was instrumental was the research & development institutes or universities with weights 0.797, on the other hand the government or related service was an actor or performer who was instrumental in the capacity of farmers in the farming of paddy and beef with 0.590 and weights 0.317. The extension officers or companion was an actor or performer who was instrumental in improving the performance of extension officers (weighting 0.530).

The interests of the actors with the aim of strengthening the capacity of farmers to adopt technology that results obtained for the enhancement of the capacity of the farmers in cow waste processing technology as a fertilizer, the role of private ranchers and farmers or entrepreneurs was huge with weights 0.327 and 0.400.

Private parties or entrepreneurs play a role in the achievement of the purpose of extension officers and companion was instrumental in the development of materials/methods extension technology based on the needs of farmers with weights 0.378.

Government or agency of livestock was instrumental in the achievement of the objectives for improving the performance of extension officers in mentoring the farmers, and research & development institutes or universities contributed to the achievement of the objectives for the development of the

material/methods extension technology based on the needs of farmers.

Results of the comparison of alternative strategies with the goal of showing that to increase the capacity of the paddy straw processing technologies dairy farmers as feed applied technology optimally required waste treatment at the level of the farmers (weighting 0.558). Increased capacity of the farmers in cow waste processing technology as fertilizer can be achieved by applying a strategy of increased knowledge and skills of extension officers in sewage treatment technology (weighting 0.443).

In order to increase achievement farmers of cow waste processing technology as biogas and development material/methods extension technology based on the needs of ranchers was required strategy, which was the provision of facilities and infrastructure supporting the application of the technology of sewage treatment (weighted 0.590 and 0.517).

To achieve the goal of improved performance extension officers in mentoring farmers for adoption of technology waste treatment required the simultaneous application of the three strategies, namely applying sewage treatment technology optimally by the farmers, the provision of facilities and infrastructure supporting the application of waste treatment technologies, as well as an increase in knowledge and skills of extension officers in waste treatment technology.

## Conclusions

To achieve the goal of improved performance extension officers in mentoring farmers for adoption of technology waste treatment required the simultaneous application of the three strategies, namely applying sewage treatment technology optimally by the farmers, the provision of facilities and infrastructure supporting the application of waste treatment technologies, as well as an increase in knowledge and skills of extension officers in waste treatment technology.

Increased capacity of paddy straw processing technologies by farmers was required a strategies in applying optimally waste treatment technology at the level of the farmers (weighting 0,558).

Increased capacity of the farmers in cow waste processing technology as fertilizer can be achieved by applying a strategy of increased knowledge and skills of extension officers in sewage treatment technology (weighting 0,443).

In order to increase achievement farmers in cow waste processing technology as biogas and development material/methods extension technology based on the needs of ranchers required a strategy which was the provision of facilities and infrastructure supporting the application of the technology of sewage treatment (weighted 0.590 and 0,517).

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