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Empowerment Model to Enhance Food Self-Sufficiency at Mushroom Industry Center

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Abstract: This research formulates a good and proper empowerment model for mushroom farmer groups in order to increase the self-sufficiency of mushroom food independence. The model developed through empowering mushroom farmers by making baglogs, F0 and F1, to the sale of fresh and processed mushroom products, both online and offline based among. Data collection is used through observation, interviews, questionnaires, documentation and surveys. The analysis method with project-based learning works directly on empowerment activities (mentoring, counseling, direct action services) in order to increase food self-sufficiency from upstream to downstream (making F0 seeds, F1 baglogs to production). Model development with path analysis is to build a among-based empowerment model formulation. The among-based empowerment strategy is developed and implemented through independent learning that places participants as objects and subjects. Participants in the empowerment of mushroom farmers, prioritize family values, physical and mental independence. The data analysis method uses the concept of a hypothetical model and analyzes the behavioral trends of mentoring participants and the results of the formulation of among-based empowerment are able to improve the mushroom food independence.

Keyword: Empowerment; Farmer; Independence; Mushroom

Introduction

The plantation, agriculture and farming sectors in Indonesia have contributed greatly in supporting food security. The agricultural sector, plantations, cultivation have provided their own space in job creation, creating new labor, improving welfare and developing real in the food sector.

The field of agricultural cultivation, especially in the field of mushroom cultivation, needed by the community continues to run until present. Some restaurants, culinary in the field of mushrooms, experience a shortage of supply from the harvest, as is the case in Sumber Rejeki Sragen mushroom farmer group. Currently Sumber Rejeki mushroom has about 10,000 baglogs, and every day produces 30-40kg of fresh mushrooms. Consumer needs are around 150-200kg/day, of course it certainly requires business development, in order to increase the supply of fresh mushrooms and various preparations.

The mushroom cultivation has supported in the food sector improvement. It has strategic value in providing food that can be used for vegetables, mushroom satay, vegetable needs, culinary to meet domestic needs and export opportunities, in addition to utilize employment opportunities (Yuli, 2018). The mushrooms produced are oyster mushrooms and ear mushrooms which are favorites in Indonesia, so the mushroom improvement is a profitable opportunity to develop.

Urgency research and opportunity, the ear mushroom and oyster mushroom is a type of model development products are needed by the community from time to time, this is due to the high number of

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consumption needs. The advantages of cultivating ear mushrooms and oyster mushrooms are: mushroom cultivation utilizes organic waste which is abundant, cheap and easily found around us, making the environment clean, beautiful and healthy (Immy, 2020). Mushroom cultivation does not require a large area of land (100 m2 can accommodate ± 7,500 baglogs, with an estimated income of Rp. 200,000 per day. Mushroom products can be used to add nutrition or menus and can increase family income and Compost used as planting media can be directly used for fish pond fertilizer, fish food and for raising worms (Suranto, 2021; Rosmiah, 2020; Erpan, 2017).

The mushrooms as a type of vegetable that is widely consumed by the public, delicious taste, high nutrition and can be used as an alternative food treatment. Mushrooms also contain 9 types of the 10 essential amino acids: arginine, histidine, isoleucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine, and 72% of the fat is unsaturated, mushrooms contain vitamins: B1 (thiamin), B2 (riboflavin), niacin and biotin. Mushrooms contain macro elements, including K, P, Ca, Na, & Mg. Mushrooms contain micro elements such as Cu, Zn and others. Mushrooms are also proven to be effective in inhibiting HIV-AIDS, cholesterol, blood sugar and cancer (Suranto, 2021; Rosmiah, 2020; Erpan, 2017; Hermawan, 2018).

Mushroom cultivation is relatively small business capital and affordable by the society, appropriate technology that is cheap & simple so that the rural society is able to do mushroom cultivation. Mushroom cultivation is possible on a small household scale, medium scale and even with modern technology. Mushroom cultivation has a short harvest time of 1.5 months already picking results, does not require feed costs, does not use expensive medications, and expensive fertilizers (Suranto, 2021; Erpan, 2017; Hermawan, 2018; Yusri, 2020).

The problem, urgency and justification that occurs is that mushroom farmer groups; require the procurement of mushroom baglogs with a large capacity in order to fulfill supply, develop various processed mushrooms, market fresh and processed mushrooms. According to this problem, how can mushroom farmers be more independent. The research aims to improve business self-sufficiency through upstream to downstream empowerment (Deni, 2022; Ni, 2021). Empowerment is through the concept of Participatory Rural Appraisal, including lecturers, students and partners collaborating in counseling, mentoring, making planting media, making baglogs, baglog management, barns, ventilation and lighting of barns, mushroom rearing, supplying F0 seedlings, F1 and selling fresh mushrooms to post-harvest processed products.

The research stages are divided into four stages; preparation of the barn, preparation of F0, F1, and baglogs, maintenance of cultivation, post-harvest including fresh mushrooms and processed mushrooms. This empowerment research is urgent to analyze of: demand for increased production, broad market opportunities and potential that make mushroom farmers have to be independent to meet consumer needs, minimal availability of F0 and F1, as well as mushroom baglogs, lack of business support equipment, press machines and unfit for use conditions of the barn, low knowledge and skills about marketing digitalization, lack of knowledge and skills to process mushrooms into preparations so that they become added value and mushroom cultivitation using land (Suwardji, 2021; Wayan, 2021)

Empowerment carried out to increase mushrooms food sector independence uses three latent variables consisting of: mental variables of formers (X1), empowerment (X2) and achievement of independence food sufficiency results (Y). Mentality of formers has 6 indicators: confidence, optimism, commitment, initiative, dexterity in action, risk-taking with calculation. Empowerment has 6 indicators: counseling, mentoring, guidance, facilitation, training and strengthening. Meanwhile, food independence has 3 indicators: availability of food products, availability of imported export products and food dependence on the state, but in this research it is said to support food security with the indicator of food product availability (Edy, 2020).

The policy of strengthening food security is a central issue in development and is the main focus in agricultural development. The increase in food needs along with the increase in population and employment opportunities in order to obtain a decent income so that access to food are the two main components in realizing food security. In accordance with law No. 7 of 1996 concerning food, food in a broad sense includes food and drink from plants and livestock as well as fish, both primary and processed products. With this definition of food, the level of national food availability for consumption measured in energy and protein units in 2000 was 2992 Kcal/capita/day and 80 grams of protein/capita/day1. This figure has exceeded the energy and protein adequacy standards recommended in the 2000 National Widyakarya for Food and Nutrition, namely 2500 Kcal/capita/day and 55 grams of protein/capita/day2. Even though national food availability has exceeded energy and protein adequacy standards, this does not guarantee adequate consumption at the household or individual level. The average per capita consumption level per day of the Indonesian population in 1999 was 1849 Kcal or 82.2 percent of the adequate standard (Edy, 2020).

The concept of among mentoring applied humanizes humans with egalitarian asah-asih-asuh. The concept of the among-based model has: mentoring material (curriculum), which is the main element in the mentoring process (Kusmiyati, 2021). Facilitator (empowerment companion), is an element that is required to be able to understand the situation of the participants. Tenants (mushroom farmer group participants) who must be fostered, guided, directed and served to be more independent. Achievement of results as the ultimate goal in the program, namely food security independence the structure of the empowerment concept according to Figure.1

The components of the mushroom farmer group empowerment model developed have several components and each component has content in it. The components, the contents of each sub-component are shown in Figure -2.

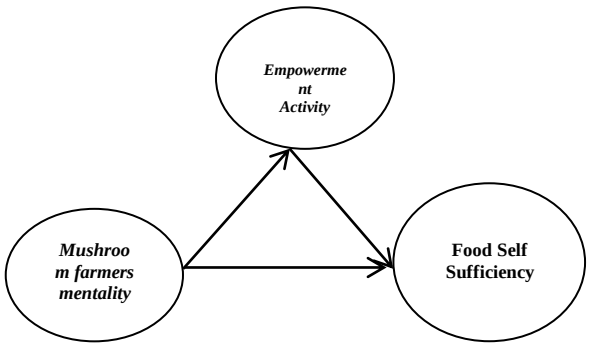

Figure 1. Structure of the empowerment concept model among

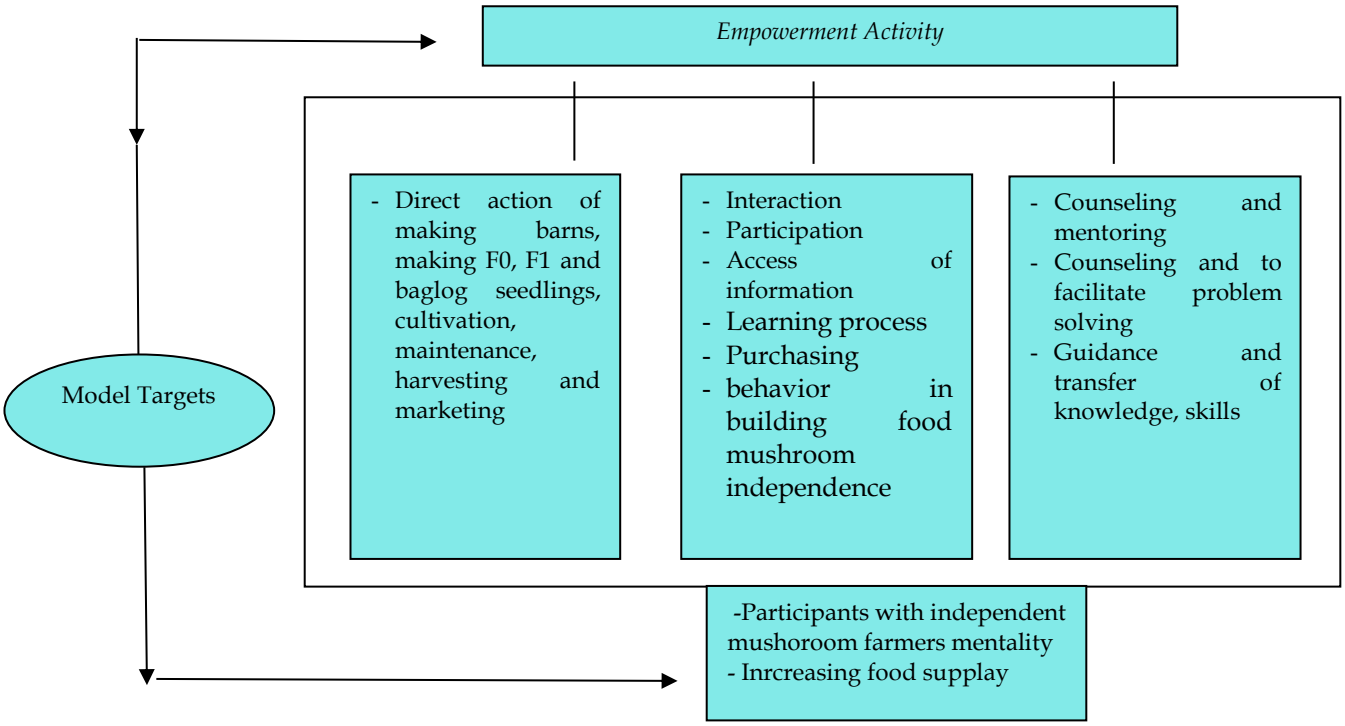

Figure 2. Components and contents of the empowerment model among

The content component of the empowerment model consists of doing, empowering, facilitating and evaluating, with the content of each component as follows: Doing, where participants (mushroom farmers) directly practice, starting from the preparation of barns, F0, F1, baglogs, maintenance, to harvest and market in the guidance of senior assistants and experts; Empowering is an activity of strengthening participants, participation interaction, access to information, observation, mentoring, direct observation of participants' behavior in mushroom cultivation; Facilitating is the process of facilitating, providing assistance in problem solving, interactively participatory, hands-on practice, demonstrations, discussions, lectures, and so on; Evaluation is an assessment process, monitoring is carried out in conjunction with the mentoring and facilitation process; and than evaluation is carried out authentically, and periodically so that evaluation activities are carried out when participants are practicing cultivation. Portfolio assessment is applied to participants, in the form of documentation, recording. Evidence of the learning experience of the cultivation can be recorded directly, resolved quickly, arranged systematically, and the development of participant behavior can be monitored.

Method

This research activity was carried out on a group of mushroom farmers in the mushroom industry center, Sambirjo Sragen and can be developed in other areas that have similar activities, the same characteristics and the same potential. The formulated model can be developed has goodness of fit model, by taking the object of the research sample on 20 mushroom farmers, through the mental variables of mushroom farmers' and the achievement of results in the form of mushroom food independence. This sampling has considerations: groups of farmers who are members of mushroom farmer groups; willing to increase mushroom food availability, increase mushroom consumption (Indah, 2019).

Data collection methods in the study used a combination of observation, interview, questionnaire and informant activities to dig deeper into the problems encountered. The implementation method is carried out with active learning, learning by doing the concept of RRA (Rapid Rural Appraisal)/PRA (Participatory Rural Appraisal), Projcet Based Learning where researchers continue to explore problems and actively communicate with mushroom farmers (Indah, 2019; Pratiwi, 2020).

Mixed research methods are used to consider qualitative and quantitative both informant and action data. This research offers breakthroughs as research novelty: (a) designing about the formulation of a mushroom farmer food development model formulation for empowering formers mushroom, (b) there has never been found similar research in the mushroom industry center-SMEs, (c) testing the formulation of an empowerment model for mushroom farmer groups.

This empowerment method uses the RRA (Rapid Rural Appraisal)/PRA (Participatory Rural Appraisal) approach, as a philosophy, a method approach known as a reference for understanding the condition of problems in the village quickly and responsively (Pratiwi, 2020; Suranto, 2022). To improve the psychomotor absorption of material, the implementation of activities using the Project Based Learning (PBL) method is a learning method where participants (mushroom farmers) can explore their abilities, assess, interpret, and inform the results. Referring to the results of the activity, that the village leadership and several mushroom farmer groups and SMEs, strongly support the village government to become a mushroom tourism village, mushroom village and center for superior fresh and processed mushroom products. Referring to the data results by the research team with the flow and activities in line with the initial framework, among others; problem mapping, model formulation, determination of problem solutions, designing instruments and implementation, formulation of the initial model, data collection through distributing questionnaires, formulation of the final model.

Stages of research activities include problem mapping, solution planning, focus group discussion activities, questionnaire data collection, data analysis, goodness of fit models and implementation of model results. Assistance to 20 mushroom farmers, through the provision of F0 and F1 to make mushroom seeds and baglogs in the context of strengthening food security. Treatment trends are carried out periodically to observe, the harvest results are very good.

Results and Discussion

Starting from seven stages, the research has resulted three groups including: stage-1 group, collecting data and grouping data. Stage-2 groups conducted model formulation, and stage-3 groups discussed and observed the results of the empowerment model for mushroom farmers.

Stage-1, the activities carried out include mapping empowerment problems. The research team went to the research location with the aim of obtaining a number of problem information. Problems are described and observed through qualitative and quantitative approaches. Problem mapping activities are conducted through visiting and interviewing mushroom farmers.

Stage-2, formulating an empowerment strategy model, based on the analysis, three variables were generated to formulate an optimal and valid empowerment model. The model contains business mentality variables, empowerment and business independence variables.

Based on the results of the formulation of the model developed, then tested for validity and reliability as a measuring tool, the results are shown in Table-1 and Table-2.

Tabel 1. Construct Validity

Variable	Cronbachs Alpha
Formers mentality	0.77
Empowerment	0.70
Food Self Sufficiency	0.72

Tabel 2. Construct Reliability

Variable	Cronbachs Alpha
Formers mentality	0.86
Empowerment	0.82
Food Self Sufficiency	0.89

Based on the results of Table-1, it is known that the question items used to measure the variables of business mentality, empowerment and business

independence are valid because they have a Cronbach's Alpha coefficient > 0.3. Meanwhile, the reliability test of the empowerment and welfare variables is considered valid because it has a Cronbach's Alpha coefficient> 0.7 (Suranto, 2022; Soegiyono, 2019).

The analysis then proceeded through Conformatory Factor Analysis (CFA) testing to identify the correlation between indicators (manifest variables) and latent variables (construct variables) represented in Table-3.

Referring to table-3, it results that the loading on each indicator on the variable is> 0.5 with a significance of <0.05 (5%). When considering the loading value, it can be proven that all indicators in each variable are significant and proper to be used as a measuring tool for latent variables. Thus the resulting structural analysis leads to the formulation represented as in Figure-2

Meanwhile, the among model test applied in the context of empowering mushroom farmers is feasible and has goodness of fit model. Goodness of Fit Test of the SEM concept model, the parameters used as determinants of the Goodness of Fit Model with the criteria p (probability)> 0.05; GFI (Goodness Of Fit Model) > 0.90; AGFI (Adjusted Goodness Of Fit Index)> 0.90; CFI (Comparative Fit Index)> 0.90; RMSEA (Root Mean square Error Of approximation) < 0.08. If at least 3 (three) parameters have met the requirements, the model that has achieved goodness of fit can be tested in the field (Pratiwi, 2022; Soegiyono, 20219).

The function of the applicability of the empowerment model is identified through testing the model analysis with a path analysis approach, as the coefficient of direct influence of exogenous variables on endogenous which is represented in Table 3.

Table 3. Score of confirmatory factor analisys (CFA)

Variable	Loading
Confidence← Formers mentality	0.67
Optimistic← Formers mentality	0.57
Commitment← Formers mentality	0.69
Initiative← Formers mentality	0.56
Skillful← Formers mentality	0.64
Risk management← Formers mentality	0.67
Counseling←Empowerment	0.60
Mentoring←Empowerment	0.78
Guiding←Empowerment	0.68
Facilitating←Empowerment	0.58
Training←Empowerment	0.67
Reinforcement←Empowerment	0.70
Food Availibility← Food Self Sufficiency	0.72
Production Increasis← Food Self Sufficiency	0.70
Increases Consumers← Food Self Sufficiency	0.71

Table-4 shows that the Mushroom farmers mentality variable has a significant direct effect on empowerment with a coefficient of 0.675 and p < 0.05. Meanwhile, empowerment activyty has a significant effect directly on food independence with a coefficient of 0.789 and p < 0.05. The mushroom farmers mentality variable has a significant effect directly on Mushroom farmers mentality with a coefficient of 0.745 and p < 0.05.

Based on the results of analyzing the correlation among the formulated model variables, the goodness of fit empowerment model has a strategy in its empowerment. The empowerment strategy using three variables of formers mentality, empowerment and food independence for mushroom farmers can be carried out with a functional strategy. This strategy includes; functional development strategy for food availability, which includes functions that enable groups of mushroom farmers to live as a healthy socio-economic unit, between groups that are interrelated with finance, marketing, resources and product development; Governance management functional strategy, which includes the functions of planning, organizing, implementing, controlling, staffing, leading, motivating, communicating, decision making, representing and integrating; Food security strategic issue, functions to control the environment, both known environmental situations and unknown or ever-changing situations.

Table 4. Direct Effects

Variable	Path	P-Value
Mushroom farmers mentality→ Empowerment Activity	0.67	0.04
Empowerment Activity→ Food Self Sufficiency	0.78	0.03
Mushroom farmers mentality → Food Self Sufficiency	0.74	0.04

Product development can be shown by the ability to access the market widely, sell mushrooms widely, so that products increase in number. This requires business actors to be more creative, dynamic, and broad-minded in creating and developing a product (Machdufi, 2021). The development of food independence can also be through a promotional approach, which will attract the attention of consumers to buy fresh or processed mushroom products, in order to boost sales. Promotion plays a role in producing good information delivery to consumers about the benefits or advantages of a product, and opportunities for ear mushrooms and oyster mushrooms This is a type of business that has great potential developed, community needs increases over time, this due to the high amount of consumption needs (Bambang, 2017; Ratih 2019; Suparto, 2020).

The development of mushroom food independence can be implemented through a price

approach. If the price of fresh mushrooms is too expensive, then the product concerned will not be affordable by the local market, then fresh mushrooms and processed mushrooms are sold at market prices so that it is hoped that the target consumer buying interest tends to increase towards mushroom products because in buying a product consumers not only consider its quality, but also think about the feasibility of price.

Therefore, empowerment programs can be carried out by personal, with the aim of improving knowledge, skills, attitudes, and self-awareness for mushroom farmers. Besides personal, mushroom products can be developed in groups, this is to increase the capacity of the number of mushrooms for mushroom farmer groups to provide mushroom needs (Nasution, 2016; Aini, 2013; Valencia, 2017).

Society can do many things through use of home gardens, such as urban areas farming, planting toga (family medicinal plants), planting fruit in pots (tabulampot), planting using hydroponics, raising fish inside bucket, and so on. Land use yard or garden around the house creating job opportunities, empowering the family or home stairs, providing additional food thereby reducing household financial expenses for food. The end result, food security and family nutrition can be better. Resilience family food is one of the characteristics of a family whether the family is well off or not meet their food needs. Food is a basic human need, so cannot be separated from everyday life (Handayani, 2021; Isnawan, 2016). So by providing F0, F1 this is very good for supporting food security and it is hoped that the model can be developed elsewhere (Aluh, 2023; Kusmiyati, 2021; Suwardji, 2021; Hamzens, 2018; Parsudi, 2019; Werdhany, 2012; Sasongko, 2019; Hasanah, 2020)

Conclusion

Based on the research results, it can be concluded that the formulation of an empowerment model for mushroom farmers is based among goodness of fit models. The formulation of empowerment through three latent variables and four stages of empowerment and based on hone, love, foster by liberating participants is able and effective in increasing the food independence of mushroom farmers

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Conflicts of Interest
The authors declare no conflict of interest

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