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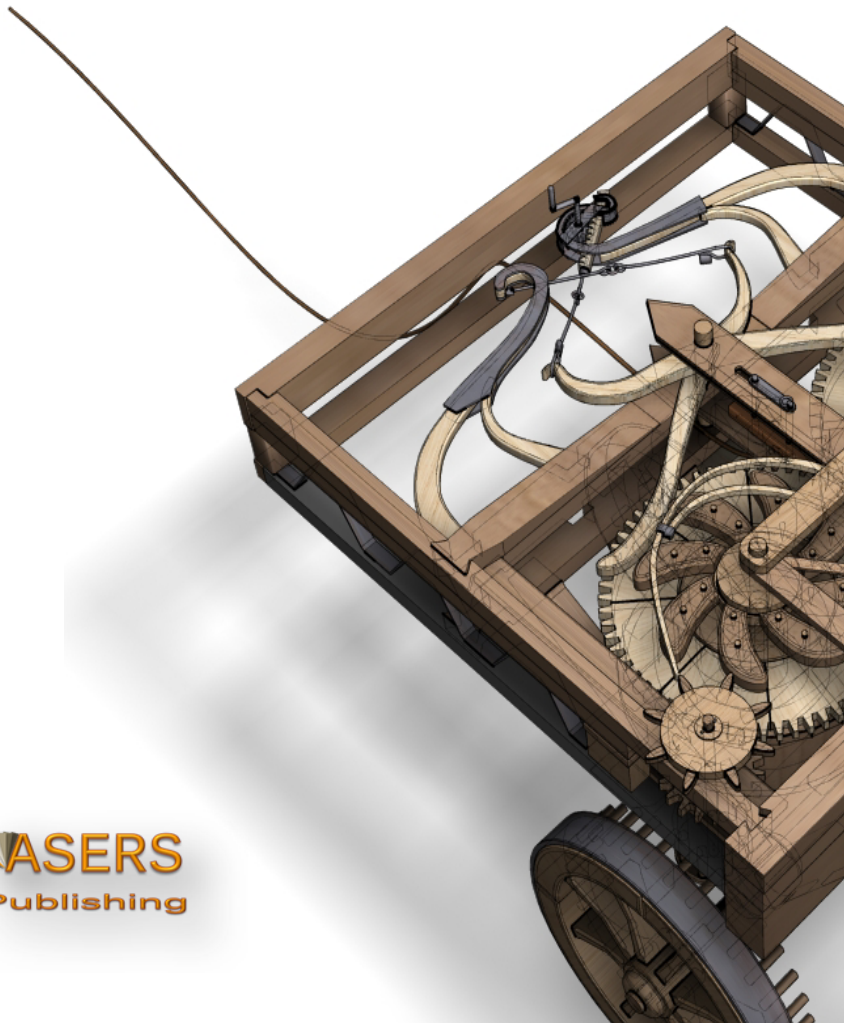
Journal of Environmental Management and Tourism



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Design of the Bali Province Food Security Action Plan towards Food Independence

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Abstract: The problem of hunger is one of the problems that still occur in Indonesia. The problem of hunger is closely related to the problem of staple foods, such as the unmet security of staple food, rice as the community's main food, and the increasing demand for staple foods. This research aims to analyze the challenges faced by Bali Province in maintaining sustainable food security and to design food security action designs in Bali Province towards food independence. The data used in this research are primary data and secondary data with a descriptive analysis method using ISM analysis. The results of the research show that food challenges that occur in Bali Province include reduced agricultural land, unbalanced supply and demand for food commodities, weak use and mastery of technology, lack of farming management and product marketing, the proportion of crop loss and food waste is still quite high, food loss due to inaccuracy in handling food, the area of agricultural land per capita is very limited, the number of young people interested in working in the agricultural sector is still problematic, the age of farmers over 45 years reaches 64.2%, Indonesia is also still facing three times the burden of nutrition, climate change, and hydrometeorological disasters. The Bali Province's food security design towards food independence consists of farmers, government, companies, financial institutions, and agricultural cooperatives who are interconnected with each other.

Keywords: sustainable development; design; resilience; food; challenge.

JEL Classification: Q00; Q01; Q19; R11.

Introduction

The Sustainable Development Goals (SDGs) set a vision for a more sustainable world, to be realized by 2030 (Bennich, *et al.* 2023). Aligning it with the United Nations Sustainable Development Goals (SDGs) is still a significant difficulty (Hsieh, *et al.* 2023). The United Nations (UN) adopted the 2030 Agenda for Sustainable Development in 2015 to address the most urgent issues facing humanity, including poverty, inequality, land degradation, climate change, and biodiversity loss (Wu, *et al.* 2023). This shared agenda provides a framework for all nations to work together on sustainable development projects.

Not all of Indonesia's success in realizing the SDGs can be felt. One of the problems in Indonesia that still occurs today is the problem of hunger. The problem of hunger also occurs in several countries. This is in accordance with research conducted by Medialdea *et al.* (2018), in Spain stating that without a doubt, one of the

most serious issues facing humanity today is hunger. In Belgium, overpopulation is an important issue to consider because it is linked to problems of poverty and hunger (Montagu 2018). In Spain also, hunger is one of the problems experienced by millions of women every day which is not uniformly viewed by the international community as something that is offensive and contrary to human rights (Ponce, *et al.* 2018).

Staple food problems continue to occur in Indonesia, such as the unmet security of staple food, rice as the main food ingredient for society, and the increasing demand for staple food as time goes by. Due to their reliance on rice as their primary source of calories, the expanding populations of emerging nations, particularly Indonesia, are experiencing issues with malnutrition or hunger (Sitaresmi, *et al.* 2023). In Bali, Subak is a community organization that regulates rice irrigation systems in rice fields (Suamba, *et al.* 2023). Furthermore, Ickowitz *et al.* (2023) stated that Indonesia is facing several nutritional challenges.

In Oman, policymakers and governments around the world have paid close attention to food security because of its importance in attaining the Sustainable Development Goals (SDGs) (Saboori *et al.* 2023). Problems like this can be resolved if people are aware of the potential of other staple foods, such as cassava, corn, potatoes, and other staple foods that contain carbohydrates as a substitute for rice. The results of the study indicate that rice, corn, cassava, and sweet potatoes are food commodities that are major sources of carbohydrates that are inelastic (Rozi *et al.* 2023).

Data from the Ministry of Agriculture's Food Security Agency shows that there are four out of 34 provinces in Indonesia that do not yet have regional regulations regarding food security. Provinces that do not yet have regional regulations regarding resilience include North Maluku, DKI Jakarta, Central Sulawesi, and Bali Province (Ministry of Agriculture, 2021). Bali Province GRDP Data According to Business Fields 2017-2021, food crops, horticulture, plantations, and livestock are the main spearheads of priority programs by the Bali Province Agriculture and Food Security Service. The agricultural potential possessed by Bali Province before the pandemic in 2019 experienced a recorded decline of 13.45% compared to 2010 which reached 17.17%. The COVID-19 pandemic has caused the agricultural subsector to contribute 15.11% in 2020 and increase again in 2021 to 15.71% (Statistics of Bali Province, 2021).

Bali Province's Food Security is to realize the Bali Development Vision for 2018-2023 *Nangun Sat Kerti Loka Bali* through the Universal Development Plan towards a New Era of Bali. The development of the agricultural sector is described through the first Mission, namely ensuring that the needs for food, clothing, and shelter are met in adequate quantity and quality for the life of Krama Bali, and the second Mission, namely realizing food independence, increasing added value and agricultural competitiveness, and improving the welfare of farmers. For this sustainability, it is necessary to design a food security action plan in Bali Province towards food independence.

The aim to be achieved in this research is to analyze the challenges faced by Bali Province in maintaining sustainable food security, as well as designing a food security action plan in Bali Province towards food independence.

1. Research Background.

Food security and insecurity can provide information to policymakers at the regional and central levels. Programs related to food security must be oriented to the needs and potential of a region. These programs should aim to protect against land conversion and food crises in the short, medium, and long term. The Food Security and Vulnerability Atlas (FSVA) has created a conceptual framework for food and nutrition security. This concept is based on three pillars of food security, namely availability, access, and utilization of food which is then integrated with nutrition and food safety issues (Suryana 2014).

Food availability is characterized by conditions of food availability from domestic production, food reserves, imports, and food aid. Food assistance is provided if the two main sources cannot meet needs. Regarding food access or affordability, every household must be able to obtain sufficient nutritious food through one or more various sources, for example through production, own supplies, purchases, bartering, gifts, loans, or food aid. For this reason, access is very necessary because food that is available in sufficient quantities in an area cannot all be utilized by the local community due to physical, economic, or social limitations. After gaining access, the next fulfillment is food utilization. Food utilization is related to household food use and the individual's ability to absorb and metabolize nutrients. Food utilization consists of storage, processing, preparation, and safety of food and drinks, hygiene conditions, feeding habits (individuals with special food needs), distribution of food within the household according to individual needs (growth, pregnancy, and breastfeeding), and health status every member of the household.

The Bali Provincial Government has established a development program to improve community welfare in various sectors of life. This development is structured comprehensively and sustainably by taking into account the natural carrying capacity of Bali which is guided by the planned universal development program contained in the program as an implementation of the Nangun Sat Kerthi Loka Bali Vision. With this program, it is hoped that community welfare will be achieved while preserving the surrounding nature as a support for human life in various sectors of life. Food and nutritional security can be achieved through the involvement of all stakeholders in an integrated, measurable and sustainable manner so as to achieve "food hunger free and nutritional hunger free" (Bali Provincial Regional Regulation Number 7, 2022).

This research's novelty resulted in the design of a food security strategy in Bali Province through ISM analysis. From the results of this analysis, strategies can be derived that can be a driving force for the realization of other strategies (diagraph strategy). Then, through level partitioning, strategy implementation can be determined based on activity priorities (time period).

2. Methodology

This research was conducted in Bali Province because Bali Province does not yet have a Regional Food and Nutrition Action Plan Guide for 2020-2024. The data required in this research is primary data and secondary data.

Primary data was collected using the Focus Group Discussion (FGD) method and in-depth interviews. The regional apparatus interviewed at the provincial and district levels consisted of the Department of Agriculture and Food Security, the Department of Maritime Affairs and Fisheries, the Department of Industry and Trade, the Department of Cooperatives, Small and Medium Enterprises, the Department of Social Affairs, Women's Empowerment and Child Protection, the Department of Communication, Informatics and Statistics, Community Development Service, Villages, Population and Civil Registration, Bali Province Transportation Service, Forestry and Environment Service, Public Works Service, Spatial Planning, Housing and Settlement Areas, Education, Youth and Sports Service, Regional Research and Innovation Agency, Denpasar Food and Drug Monitoring Center, Central Statistics Agency, BKKBN, Bulog, and Bali Province PKK Mobilization Team. Meanwhile, secondary data was obtained through a literature study.

The analytical method used for the first objective, namely the challenges faced in maintaining food security, uses descriptive analysis. Descriptive analysis is a type of data research that helps describe, demonstrate, or summarize data points so that patterns can develop that meet all data conditions (Sugiyono 2017).

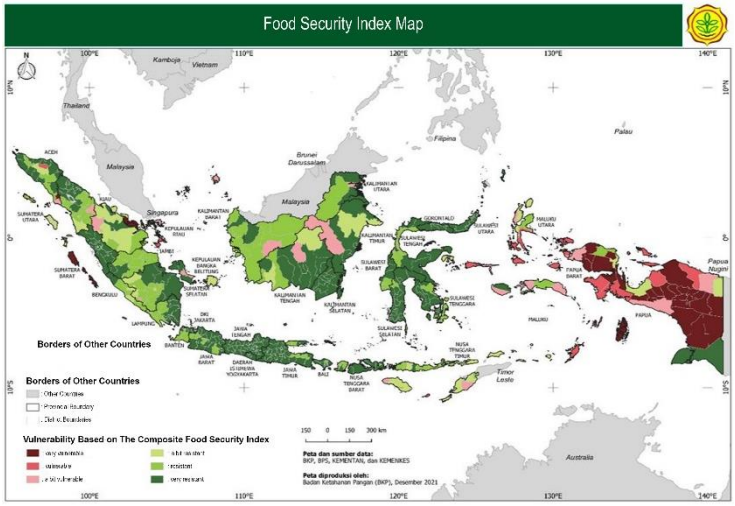
The analytical method used to answer the second objective is to design a food security action plan in Bali Province using ISM (Interpretative Structural Modeling) analysis. The ISM technique is divided into two parts, namely hierarchical arrangement and sub-element classification. The basic principle of this technique is that identification of the structure in a system will provide high benefits for designing the system effectively and for making better decisions. ISM analyzes system elements and solves them in graphical form from direct relationships between elements and hierarchical levels. The elements can be policy objectives, organizational targets, assessment factors, and so on. Direct relationships can be in diverse contexts (related to contextual relationships) (Eriyatno 2012).

3. Research Results and Discussions

Bali Province's Food Security is to realize the vision of Bali Development for 2018-2023 *Nangun Sat Kerti Loka Bali* through the Universal Development Plan towards a New Era of Bali. The development of the agricultural sector is described through the first Mission, namely ensuring that the needs for food, clothing, and shelter are met in adequate quantity and quality for the life of Krama Bali and the second Mission, namely realizing food independence, increasing added value and agricultural competitiveness, and improving the welfare of farmers.

The food security condition of a region is determined using the Food Security Index (IKP) based on the preparation of the Food Security and Vulnerability Atlas (FSVA). The achievement of Bali Province Food Security Index (IKP) by the Food Security Index Book of the Food Security Agency (BKP) of the Ministry of Agriculture of the Republic of Indonesia in 2021 achieved the highest IKP of the 34 existing provinces. The food security condition of a region is determined using the Food Security Index (IKP) based on the preparation of the Food Security and Vulnerability Atlas (FSVA). The achievement of the Bali Province Food Security Index (IKP) by the Food Security Index Book, the Food Security Agency (BKP) of the Ministry of Agriculture of the Republic of Indonesia in 2021 obtained the highest IKP of the 34 Provinces in Indonesia, with an IKP value of 83.82.

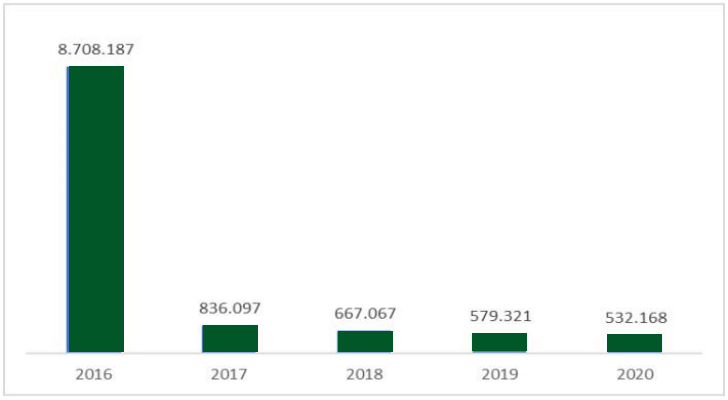
Figure 1. Regency/City Food Security Index Map in 2021



Source: National Food Agency, 2022

Based on the Regency IKP ranking, the five districts with the best scores are Tabanan (90.17), Gianyar (89.46) and Badung (89.38) in Bali Province; Sukoharjo (88.70) and Pati (88.38) in Central Java Province. Meanwhile, the five districts with the lowest scores are in Papua Province, namely Nduga (14.89), Puncak (16.17), Dogiyai (17.56), Yahukimo (18.41) and Deiyai (18.65). Based on the 2018-2023 Semesta Regional Regional Development Plan for Bali Province, the realization of rice availability during the period 2016 to 2020, respectively, is 8,708,187 tons, 836,097 tons, 667,067 tons, 579,321 tons and 532,168 tons in 2020. Realization of availability has exceeded the targets set.

Figure 2. Availability of Main Foods in Bali Province



Source: National Food Agency, 2022

Judging from energy availability, it has increased from 2016, where energy availability was 2,607 kcal/cap/day in 2016 and increased to 2,591 kcal/cap/day in 2017. This realization has exceeded the national energy requirement standard (WNPG), which is equal to 2,400 kcal/cap/day. Of the total energy availability, vegetable food is dominated by 2,108 kcal/cap/day or 79.70%, while animal food is only 537 kcal/cap/day or 20.30%. Likewise, protein availability for Bali has met the protein adequacy figure. Protein availability has increased, with the highest occurring in 2016, namely 76 grcal/cap/day, and then decreasing in 2020 to 64.31 grcal/cap/day. Even though there is a decrease in protein availability, it is sufficient to meet needs.

3.1 Challenges Faced in Maintaining Sustainable Food Security in Bali Province

Rising temperatures, unpredictable rainfall, the frequency of extreme weather, and increased pest and insect attacks are forms of drastic changes that have an impact on food production. The La Niña phenomenon and other forms of extreme weather are proof that the threat of the climate crisis is very real before our eyes. Even the World Meteorological Organization (World Meteorological Organization) estimates that the La Niña situation will last until 2023. Meanwhile, in other places, there is drought. Farmers have difficulty obtaining water for irrigation of agricultural land. A comprehensive solution is needed to mitigate and adapt to the climate crisis for farmers and

food production. The same thing was also said by Suryana (2014), food challenges can be grouped into two, namely challenges from the supply side or supply of food and from the demand side or need and utilization of food.

In terms of supply provision, there are at least five things that need attention. **First,** natural resource constraints. Competition for land use, including waters and waters, will become increasingly sharp due to high economic growth targets and a large increase in population in percentage and number. Currently, the figures for agricultural land conversion that are often presented to the public by officials or academics range from 60,000 ha to 100,000 ha per year. The quality of land and water is also increasingly being degraded due to the impact of the continuous use of chemical fertilizers and pesticides.

The conversion of agricultural land that continues to occur in Bali poses a threat to food security on the Island of the Gods, where the population continues to increase, resulting in increased food needs. Every year, 600 hectares to 1000 hectares of Bali's agricultural land is converted into housing, hotels, restaurants, and other buildings that support the tourism industry and other industries.

Second, the impact of global climate change. In the last three years, extreme climate events in Indonesia have become more real. Researchers at the International Rice Research Institute (IRRI), using data from 1979 to 2003, concluded that the annual average maximum and minimum temperatures had increased by 0.35 and 1.23 degrees Celsius respectively. The researchers further argue that rice productivity can decrease by 10 percent for every 1 degree Celsius increase in minimum temperature at night during the dry season (Peng, *et al.* 2004). Research on rice plants in North Sulawesi concluded the same thing, an increase in air temperature of 1 degree Celsius and rainfall of 5 percent could reduce rice production by around 7.7 percent (Hosang, *et al.* 2012).

Meanwhile, according to Suryana (2014), Agricultural Research and Development Agency in 2011 has conducted a comprehensive review of the negative impact of climate change on the production of various agricultural commodities through several variables, such as changes in rainfall patterns, air temperature, and sea level rise. The results of the review also concluded that global climate change hurts the productivity of various food crops.

Other research conducted by As-syakur, *et al.* (2017) shows that land that is very suitable agro-climatically for rice crops in Bali Province has decreased by 20% between the period 1990-1999 and 2000-2009, which is predominantly caused by changes in rainfall. The results of this study show that the El Nino event in 2015 resulted in a decrease in annual rainfall of 30.39% and caused most districts/cities in Bali Province to experience agricultural drought.

Third, agriculture is characterized or dominated by small-scale farming. Based on 2013 Agricultural Census data from BPS, the number of farming households is 26.14 million with an average land holding of 0.98 ha and around 56 percent or 14.6 million households on average cultivate land under 0.5 ha. These small farmers are faced with classic problems that have not been successfully overcome, such as limited access to markets, capital, information and technology (Suswono, 2013). If there is no social engineering to overcome these problems, it will be very difficult for Indonesia to achieve sustainable food security.

Fourth, there is an imbalance in food production between regions. For almost all commodities, the proportion of food production in Java is more than 50 percent of national food production. This imbalance will increase the problem of food distribution efforts and food distribution costs, making it difficult to provide food spatially evenly across all regions in Indonesia. **Fifth**, the proportion of crop losses and food waste is still quite high. Food losses due to inaccurate food handling from harvest to processing and continuing to marketing are believed to still be around 10 percent to 20 percent, depending on the commodity, season, and technology used.

Some of the food challenges that occur in Bali Province are as follows.

1. Agricultural land is decreasing due to conversion which threatens the sustainability of food production and quality.
2. Supply and demand for food commodities is not balanced. The challenges arise from two sides at once which mutually reinforce the level of difficulty, namely from the supply side (supply, supply) and the demand side (demand, need) which behave very dynamically (Suryana, 2014).
3. Weak use and mastery of technology for smallholders.
4. Lack of farming management and product marketing.
5. The proportion of crop losses and food waste is still quite high.
6. Food losses due to inaccurate food handling from harvest to processing and continuing to marketing are believed to still be around 10 percent to 20 percent, depending on the commodity, season, and technology used.
7. The area of agricultural land per capita is very limited. These small farmers are faced with classic problems that have not been successfully addressed, such as limited access to markets, capital, information and

technology, resulting in domestic agriculture having difficulty achieving efficiency with agricultural equipment and mechanization because the land managed is not concentrated in one large area.

8. The number of young people interested in working in the agricultural sector is another problem.

9. Farmers aged over 45 years reached 64.2%.

10. Indonesia is also still facing three times the nutritional burden. Based on data from the Ministry of Health (2018), the prevalence of stunting among children under five was still high in 2018, namely 30.8%. Meanwhile, other children are obese with a prevalence of 8.0% in 2018. Another burden is that the prevalence of anemia in pregnant women is still very high, namely 48.9% in 2018 due to a lack of micronutrients.

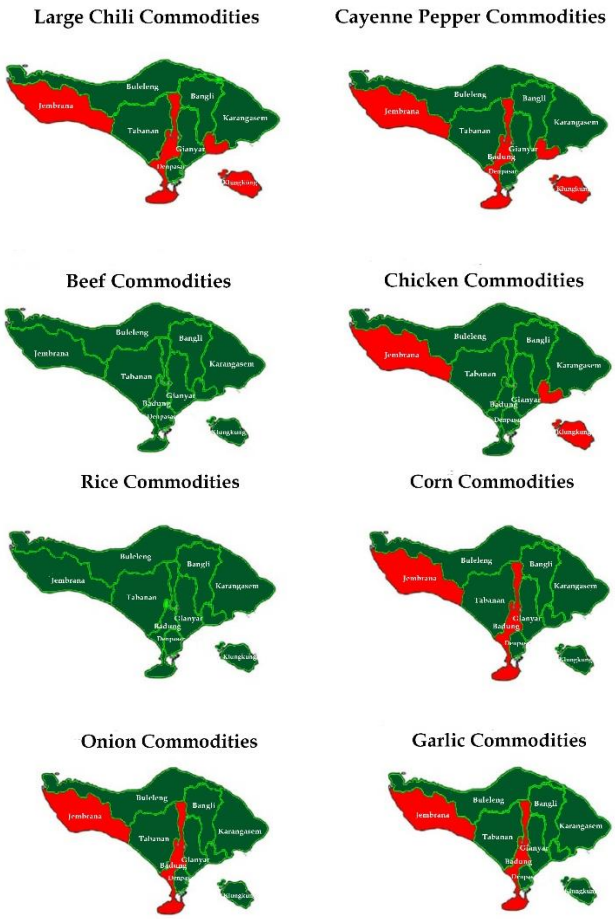
11. Climate change also creates new risks for agricultural productivity.

12. Hydrometeorological disasters such as floods and droughts cause crop failure among farmers.

3.2 Design of a Food Security Action Plan in Bali Province for Food Indepedence

The relationship between food availability and demand will influence the condition of the food balance, whether it is a surplus or deficit. A food balance surplus occurs if availability is greater than food needs, conversely, a food balance deficit occurs if availability is less than food needs. Bali is the province with the best food security in Indonesia in 2021. This is reflected in Bali's Food Security Index (IKP) score of 83.8 points, the highest compared to other provinces.

Figure 3. Potential of Strategic Food Commodities in Bali Province



Source: Bali Province Agriculture and Food Security Service, 2021

The Food Balance Situation of 11 strategic food commodities from January to June (Semester I) 2022 is generally in surplus.

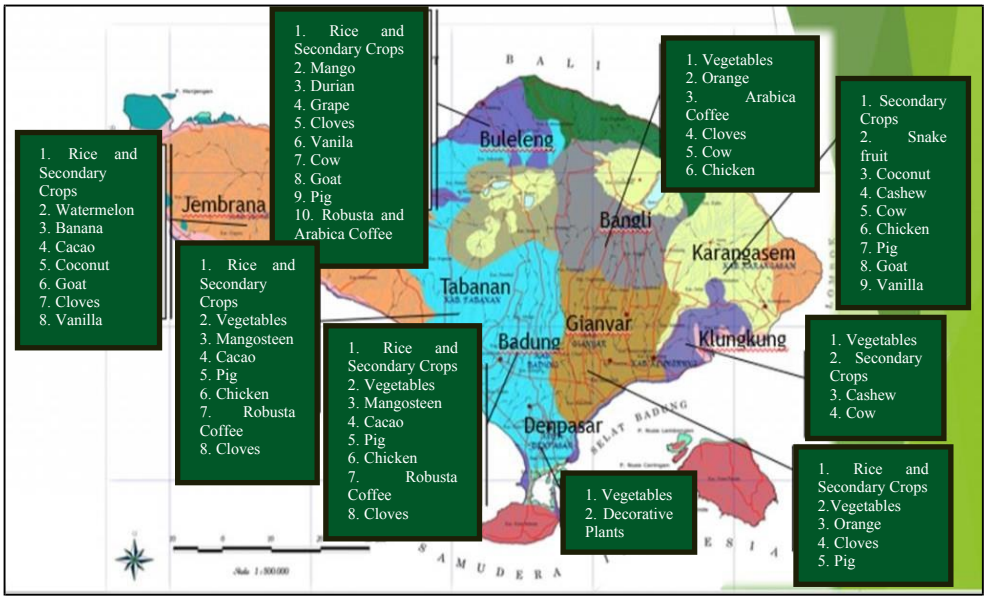
a) Rice and beef commodities in Bali Province have a surplus balance, both districts/cities.

b) In general, the balance of corn, onions, garlic, and granulated sugar in Bali Province is in surplus, but the balance in Jembrana and Badung Regencies is in deficit. To overcome the deficit of corn, shallots, garlic, and granulated sugar, distribution can be carried out from surplus districts, namely Bangli, Karangasem, Tabanan, Buleleng, Denpasar, Klungkung and Gianyar districts.

c) The large chili commodities, cayenne pepper, chicken eggs, in general the balance in Bali Province is in surplus but the balance in Jembrana, Badung and Klungkung Regencies is in deficit. To overcome the deficit of large chilies, cayenne peppers, chicken eggs, distribution can be carried out from surplus districts, namely Bangli, Karangasem, Tabanan, Buleleng, Denpasar and Gianyar districts.

For cooking oil commodities, in general the balance in Bali Province is in surplus but the balance in Jembrana and Klungkung Regencies is in deficit. To overcome the cooking oil deficit, distribution can be carried out from surplus districts, namely Bangli, Karangasem, Tabanan, Buleleng, Denpasar, Badung and Gianyar districts as shown in Figure 3.

Figure 4. Food Potential in Bali Province



Source: Bali Province Agriculture and Food Security Service, 2021

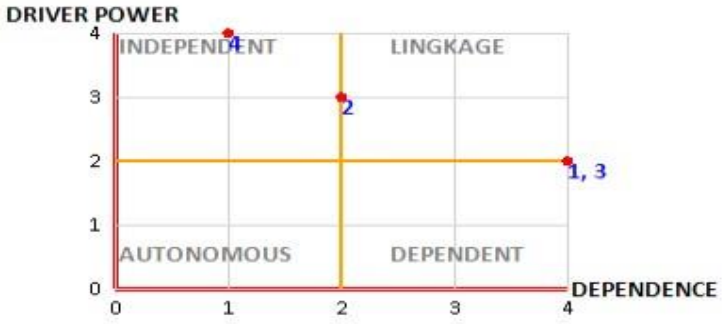
Achieving sustainable food security based on the potential of Bali Province is realized through the use of several strategies, such as the strategy increasing the availability of food that is Diverse, Nutritious, Balanced and Safe (B2SA), the strategy of increasing the affordability of food that is Diverse, Nutritious, Balanced and Safe (B2SA), the strategy of increasing utilization of (essential) food and nutrition services, and strategies for strengthening institutions and governance of food and nutrition. The four strategies are sorted based on priority because not all strategies can be implemented at the same time.

This strategic priority is the basis for forming the design of the Bali Province Food Security Action Plan Towards Food Independence. One of the analytical tools used in determining strategic priorities is the Interpretative Structure Modeling (ISM) method. ISM analysis can describe complex problems so that they can be more structured or plan strategic policies and describe dependency or interconnection relationships and hierarchies between sub-elements which are presented in graphical form. This method is called interpretation, because the justification for how one element influences other elements is carried out by a discussion group that is expert in the problem area being studied. It is called structural because the basis of these relationships will form a structure obtained from a complex set of elements that make up the problem being studied. It is called modeling because from the relationships between the elements and structures obtained a digraph model will be created.

There are four quadrants in this analysis. The Autonomous Factors quadrant is an element that has a weak driving force and dependency. Elements included in this category will later be removed from the existing measurement elements because they do not have a significant influence on the measurement process. Linkage Factors, elements included in this category are elements that have a strong driving force and dependency, or in other words, are the key to success that will significantly influence the measurement. Dependent Factors are elements that have a weak driving force and a strong dependence on other factors. Independent Factors are elements that have a strong driving force and weak dependence on other factors.

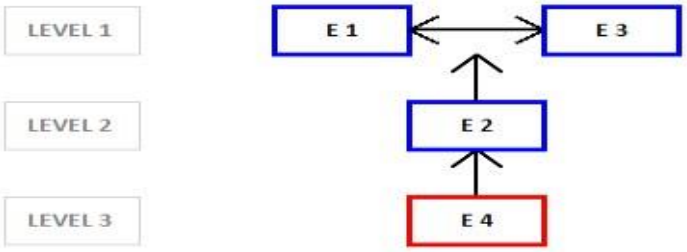
The results of the ISM analysis show that the strategy for Improving Institutions and Food and Nutrition Governance is located in the Independent quadrant. This strategy acts as a driving force/motivator for moving other strategic goals.

Figure 5. Diagraph of Food Security and Nutrition Strategies in Bali Province



Source: Data Processing Results, 2023

Figure 6. Level Partitioning of Food and Nutrition Strategies in Bali Province



Source: Data Processing Results, 2023

Notes:

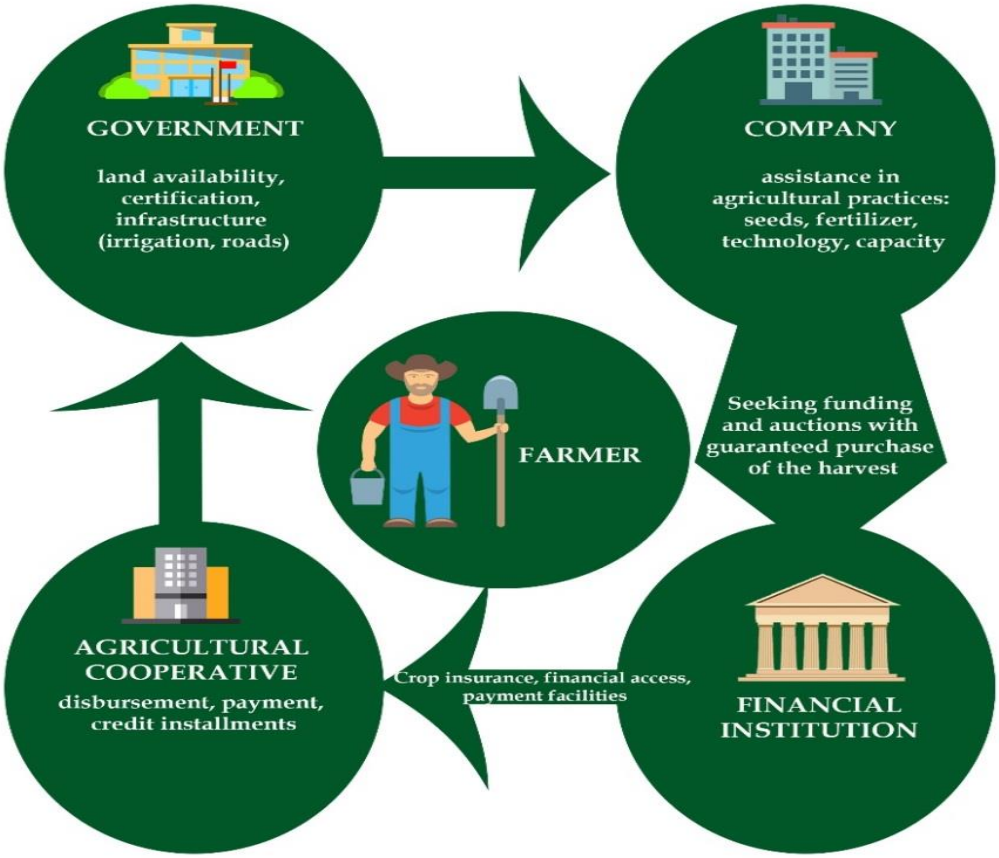
Independent Factors : E4 (Improving Food and Nutrition Institutions and Governance)
Dependent Factors : -
Linkage Factors : E2 (Increasing the Affordability of Diverse, Nutritious, Balanced and Safe Food
E1 (Increased Utilization of Food and Nutrition Services (Essential))
E3 (Increasing Independence/Availability of Diverse, Balanced and Safe Food
Autonomous Factors : -
: Short Term
: Long Term

Improving food and nutrition institutions and governance needs to be carried out collaboratively by the government, private sector (companies), agricultural cooperatives, and financial institutions. This design is one way to realize food independence. The government continues to maintain food availability through the pillars of food security, which consist of the availability of sufficient food in quantity and quality, the affordability of food or having the resources to obtain food, as well as the appropriate use of food based on nutritional knowledge. The government also needs to determine the availability of land for food in the form of LP2B (Sustainable Food Farming Land), provide organic certification, and through infrastructure improvements, such as improving irrigation networks and farming roads. LP2B is an area of agricultural land that is designated to be protected and developed consistently to produce staple food for national food independence, resilience, and sovereignty.

The company has a role in providing seeds, fertilizer, and technology and can accommodate production from farmers. Apart from that, market access to farmers' products is also a priority for the Company. Private companies have a strong commitment to supporting the realization of food security in the region. The support and concern of large companies for the development of agricultural cultivation activities has a very strategic role, especially in supporting the availability of food needs for workers recruited by the Company, so that these companies can work together with the government to support regional and national food security programs.

The existence of food security needs support from financial institutions in providing harvest insurance, financial access, and payment facilities through agricultural cooperatives in the form of disbursement, payments and credit installments. Agricultural insurance is carried out to protect farmers from losses due to crop failure due to natural disasters, attacks by plant pests, outbreaks of infectious animal diseases, the impact of climate change, and/or other types of risks.

Figure 7. Food Security Design for Bali Province Towards Food Independence



Source: Research Result, 2023

To realize a food security system, agribusiness cooperatives need to revitalize their roles and functions. The steps that must be taken by agribusiness cooperatives so that food security can be achieved to create prosperity and welfare for the community (Susilo, 2013):

1. Carry out internal revitalization and consolidation

Currently, public trust in cooperatives is declining, due to inconsistent government policies towards cooperatives and because of the weaknesses of cooperative management itself. Cooperatives need to carry out internal consolidation to improve business management (Corporate Governance). This can be done by:

a) Participate in training for Management, Supervisors, and Cooperative Managers to increase their Capacity Building.

b) Organize the administration by incorporating up-to-date Information Technology, because administration carried out manually is difficult to be accountable for.

c)Improving membership to match the identity of the Cooperative

2. Actively involved in agricultural revitalization

Agribusiness cooperatives need to improve their capabilities in the field of effective and productive farming technology in order to transfer knowledge to members and the community.

3. Create an appropriate financing scheme for the agricultural sector.

The agricultural sector (agribusiness) has different characteristics from other sectors such as trade, services and industry. Agribusiness cooperatives must have the ability to design suitable products and schemes to increase the production of their members because this sector is usually strongly influenced by seasons and high price fluctuations.

4. Not dependent on government assistance funds

If in the past cooperatives operating in the agribusiness sector, especially KUD, were very dependent on government assistance, now the era is no longer the case for agribusiness cooperatives as business entities depending on government assistance. Cooperatives must be able to be independent by exploring the potential in the area where they are domiciled and empowering their members well. If member trust has increased, members will entrust the management of their funds to the cooperative in the form of savings and term savings. Apart from

that, agribusiness cooperatives can collaborate with banks and investors to raise funds, so that services to members are no longer dependent on government assistance. Currently, many have proven that cooperatives can be independent without assistance from both central and regional governments.

5. Explore agribusiness potential by the location where the cooperative is located

Agribusiness cooperatives must be limited commodity cooperatives cultivated by farmers and cover the entire agribusiness system. Cooperative business must be adapted to the local community where the cooperative is located.

Conclusions and Further Research

The conclusions of this research are 1) The challenges in maintaining food security in Bali Province are limited natural resources (land) due to land conversion, the impact of global climate change, small-scale farming, imbalances in food production between districts/cities, food losses, 2) design Food security in Bali Province begins with re-growing partnerships (cooperatives) between farmers, government, companies, agricultural cooperatives and financial institutions. This strategy design for achieving food security encourages the realization of other strategies and is based on activity priorities (time period).

The advice that can be given in the research is that in preparing the RAD-PG (Regional Action Plan for Food and Nutrition), it is hoped that the annual targets to be achieved by the regions and their annual budget allocations can be seen. Regarding food security and nutrition, Bali Province should establish Regional Food Reserve Regulations which are synchronized with the potentials that exist in each district/city.

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Credit Authorship Contribution Statement

Widhianthini: contributed to creating the concept, as well as going directly into the field for in-depth interviews with respondents, tabulating the data.
Ni Made Classia Sukendar: contributed to the journal manuscript.
Anak Agung Gede Purantara: contributed to data processing.

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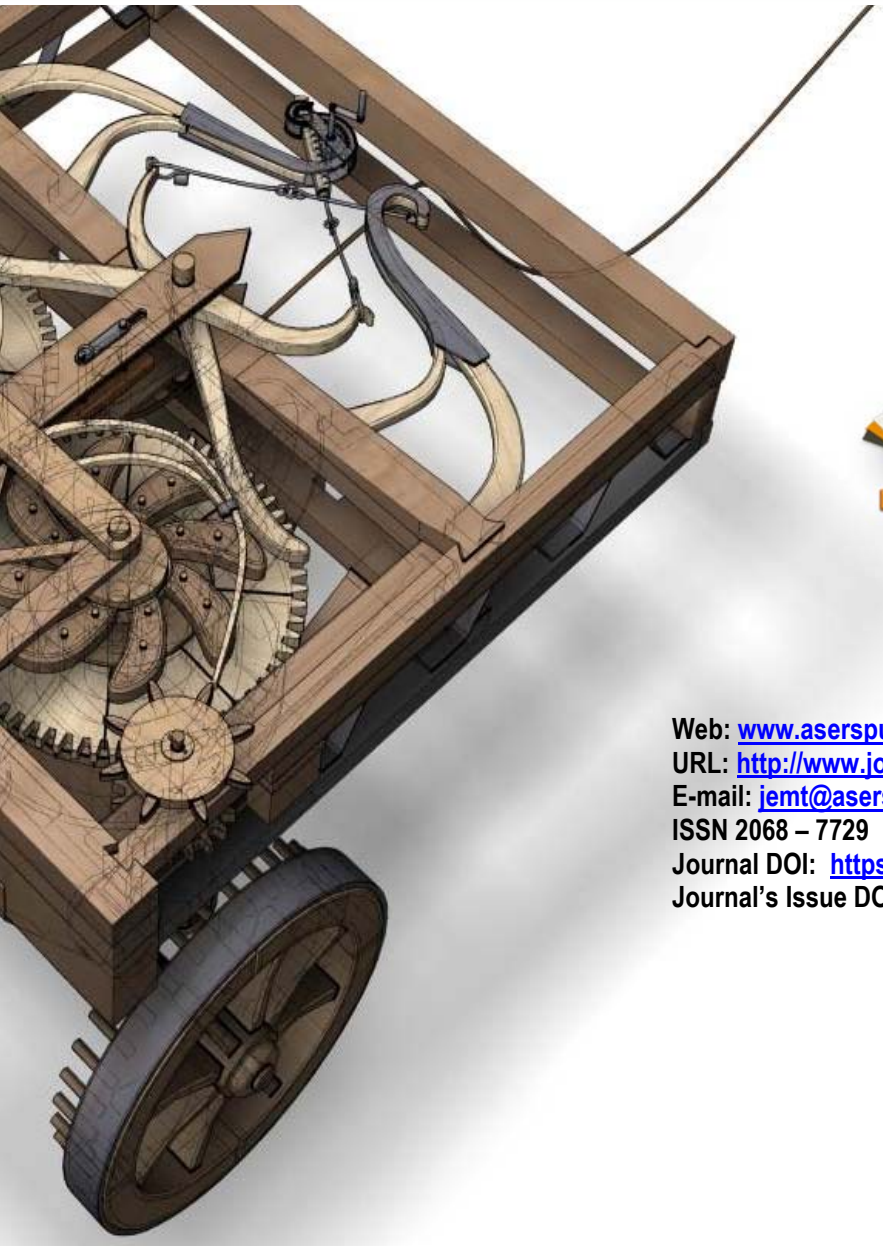

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