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An integrated food management framework: A preventive measure for food scarcity during the Prabowo Subianto administration

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Abstract: The Food and Agriculture Organization (FAO) reported in 2024 that Indonesia is at risk of facing a future food crisis if adequate food supply is not ensured. A critical aspect of food management in Indonesia lies in its management systems. Thus, this study aims to review the extent to which food management under the Joko Widodo administration has been integrated to address food shortages. Further, this study will develop an integrated food management system as an alternative to prevent food scarcity during the Prabowo Subianto administration. The methodology involves a literature review and in-depth interviews with stakeholders involved in managing the national food reserve. Findings indicate that food management in Indonesia remains fragmented and lacks integration between central and local governments, hindering effective food management during periods of scarcity. Based on an online website, the proposed integrated food management framework aims to simplify national food management and prevent food shortages.

Keywords: *Food, Model, Management information system.*

1. Introduction

The food crisis has become an anticipated threat to Indonesia in the future. [1]) has warned all countries, including Indonesia, of the danger of food scarcity. [1] states that the impact of the food crisis in Indonesia and other countries includes increasing living costs and food production, disrupting the circulation of food, community malnutrition due to lack of food, low public understanding of food scarcity, and delayed distribution and storage process of staple foods.

Furthermore, Rozaki (2021) states that Indonesia has a long history of food security issues. Indonesia faces three important issues related to food security: the availability of food stocks, access to food, and the stability of community food needs. After the COVID-19 pandemic, various food problems became challenges, including the age of farmers, fluctuations in food product prices, food policies, and food supply and security.

Food management in Indonesia has not been integrated, even though studies by [3] emphasize the importance of collaboration in realizing a proper food management system. Integrating food management will unify policy authority and responsibility for forming the food system. Indicators that can be used in acknowledging integrated food management are the availability of data in the food management system, the supporting capacity of laboratories for food testing, and the use of integrated food reporting information systems. These indicators are supported by studies from [4], [5], and [6], which state that the management of food warehouses is still partial in the reform era. This fact means that the area's ministries and regional and village stakeholders have not been connected as in the

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previous era. The shortcomings include the broken chain of command from the center to the regions or the need for optimal coordination among the food warehouse managers.

Previous studies, including those by [7], [8], [9], [10], and [11] have examined the system of food management. However, none of these studies have delved into the specific model of managing food availability, particularly rice, in village food barns. Therefore, this study focuses on developing a village food barn management model based on an Integrated Online System as a solution-oriented approach. Hence, this study will be able to assist the Indonesian government in addressing rice shortages by improving national food barn management. Further, it is anticipated that the findings of this study will contribute to the fields of food management, food economics, and food security. A logical outcome of this study is the strengthening of capabilities and professionalism in the food management model in the future.

[12] explain that ASEAN countries have responded seriously to food security concerns following the COVID-19 pandemic. Indonesia, the Philippines, and Malaysia have intensified efforts to achieve food self-sufficiency by expanding agricultural land and boosting agricultural productivity. These efforts are essential to ensure adequate food stock to safeguard against food shortages. Hence, there is a need for policies and systems capable of realizing food security. Meanwhile, [7] examined food industry management; [11] investigated integrated management systems in ISO food standards; [13] focused on local food marketing; [14] explored the impact of information systems on opinions and attitudes; [15] studied network development in the traditional food sector; [16] researched crops and livestock; and [17] delved into household food security.

From those previous studies, few have focused specifically on creating a national food management system model, especially in addressing food scarcity. Meanwhile, some others have still been studying food security from a micro perspective. For instance, [17] describe food security from a household perspective, while [18] have researched food supply but have not examined it from the perspective of management information systems. On the other hand, food sustainability has been studied by [19] but has not yet explored on the study of online-based integrated management models.

Among those studies, there is a notable lack of research in the field of integrated online food management information systems. Hence, this study aims to contribute to this scholarly domain. The proposed research will mirror the national food management information flow, from the central government down to the local level, onto a single integrated platform.

The research will focus on two primary objectives: 1) To what extent has the Indonesian government addressed food scarcity under the Joko Widodo administration? 2) How can a food management system model be designed to prevent food crises during the Prabowo Subianto administration?

2. Research Method

This study employs a literature review and interviews as its primary methodologies. These methods were selected to comprehensively examine existing literature from various sources that discuss village food barns within the context of food management, particularly in preventing food crises. The researcher conducted interviews with the National Food Agency (Bapanas), the Department of Agriculture and Food Security, and village food barn managers.

The primary research area is East Java province, encompassing Gresik, Lamongan, Lumajang, Pasuruan, Malang City, Malang Regency, Batu City, and Banyuwangi. These regions were chosen as they serve as the pillars of food barns in East Java. East Java was selected due to its status as the most populous province in Indonesia and one of the nation's primary foods centers.

3. Result and Discussion

3.1. National Food Management During the Jokowi Administration

Since the presidency of the Republic of Indonesia in 2014, Jokowi has undertaken efforts to manage national food security. This effort is reflected by establishing the National Food Agency (Badan Pangan Nasional), which works in collaboration with Bulog (the National Logistics Agency) and other relevant

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ministries at both central and regional levels. The agency's primary responsibility is to regulate national food resources, ensuring that food stock is sufficient to meet the needs of the Indonesian population. However, based on interviews with respondents and a literature review, national food management during the Jokowi administration was not optimal, as summarized in Figure 1.

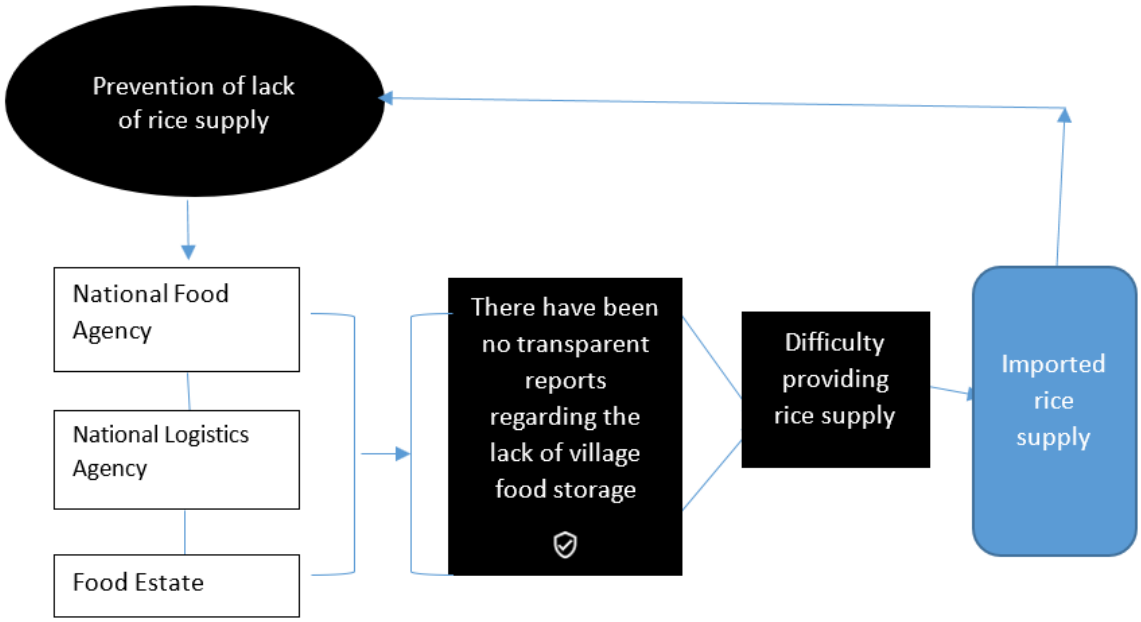

Figure 1.
Jokowi era food supply management system.

From Figure 1, it can be observed that the Jokowi administration's efforts in managing national food security have been quite significant. However, the government has not yet prepared food storage facilities (lumbung pangan) in every village, relying instead on the food estate program, which has not been effective in addressing rice shortages. Also, while Bulog has stored rice, its stock levels are sometimes insufficient due to the lack of transparent reporting on stock levels from the regional to the national level [20].

As a result, if food shortages occur, particularly with rice and other essential staples consumed by the Indonesian population, the existing food management information system is not yet capable of addressing the problem. Rice imports cannot resolve food shortages, as other countries around the world also require rice for their populations. This is evident from the increase in rice imports, as shown by data processed by the Central Bureau of Statistics (BPS), which is presented in Table 1 [21].

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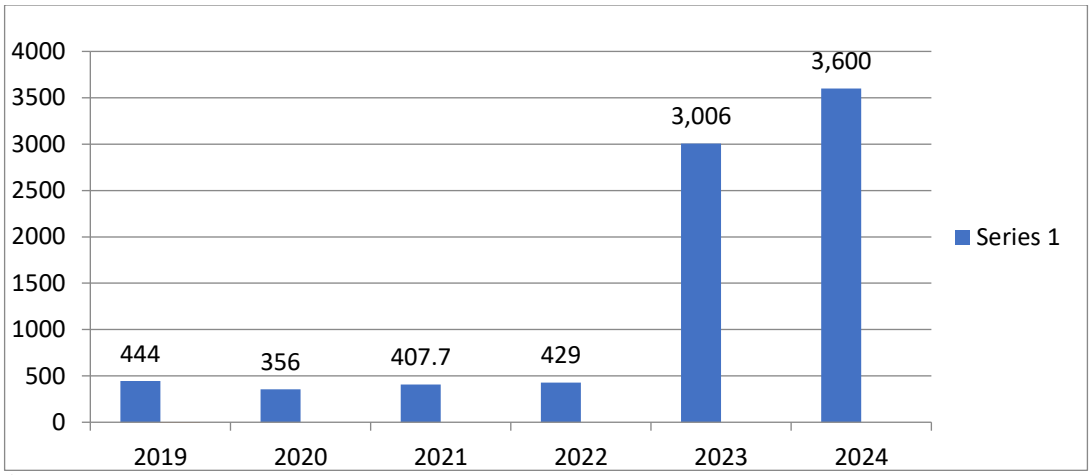

Figure 2.
Indonesia's rice imports in tons (2019-2024).

Based on Figure 2, there has been a significant increase in rice imports from year to year, particularly in 2024, which reached 3.6 million tons. This sharp rise in 2024 was triggered by a government policy decision in early January 2024, where the government imported 43,000 tons of rice with a value of USD 279 million. This figure represents an 82% increase compared to January 2023, when the government only imported 243.66 thousand tons of rice.

3.2. Framework of the Food Management System Model During the Prabowo Subianto Administration

After winning the general election, Prabowo Subianto was inaugurated as the President of the Republic of Indonesia on October 20, 2024. His next step is to implement a national food management program to prevent a potential crisis. In this study, the researcher interviewed several central and regional government respondents.

Based on interviews with the National Food Agency and village food barn managers in various regions, the following findings can be summarized:

3.3. National Rice Supply

National rice availability remains a serious problem for the Indonesian government, as rice imports from other countries to Indonesia are still facing difficulties. These high imports are done to prevent a shortage of national rice stock. This finding supports the research conducted by [22].

3.4. Food Management Information System

During the Jokowi administration, the National Food Agency and the Ministry of Agriculture managed the food management information system. At the regional level, it was overseen by the Agriculture and Food Security Offices in each district or city. Meanwhile, at the village level, it was managed by the village government through the Village-Owned Enterprises (Bumdes) or other designated village institutions [23]. However, not all villages have food storage facilities (lumbung pangan). Only a maximum of 30% of villages in each district or city have such storage facilities which poses a threat to national food security [24].

3.5. Disarray in Information and Management

Field data reveals that rice management information is still not fully centralized. In other words, there are overly many parties involved in rice management at the regional level. For example, there are too many intermediaries and rice sales are often directed outside the region, even when the region still

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requires local rice. The government has not yet been able to prevent these intermediaries from manipulating rice prices and disrupting food distribution [25].

From interviews with respondents and a review of various literature, it is clear that during the Jokowi administration, the measures to prevent national food shortages were not yet optimal. This result aligns with the theories of [5] and [26], who argue that national food management requires a secure system that ensures sustainable food availability and transparency. This is further reinforced by the research of [27], which suggests that a strong food system must meet three criteria: it should foster adaptive social and cultural interactions in response to changing conditions, ensure that the agricultural industry aligns the food supply chain with minimizing production losses, and promote agricultural product diversification for sustainability, health, and economic welfare.

Therefore, the researcher proposes a model for an integrated food storage management system through a website-based application that can be accessed by all authorized parties involved in food storage management at the village, sub-district, district, and even national levels. The proposed framework design of the food management model is as follows.

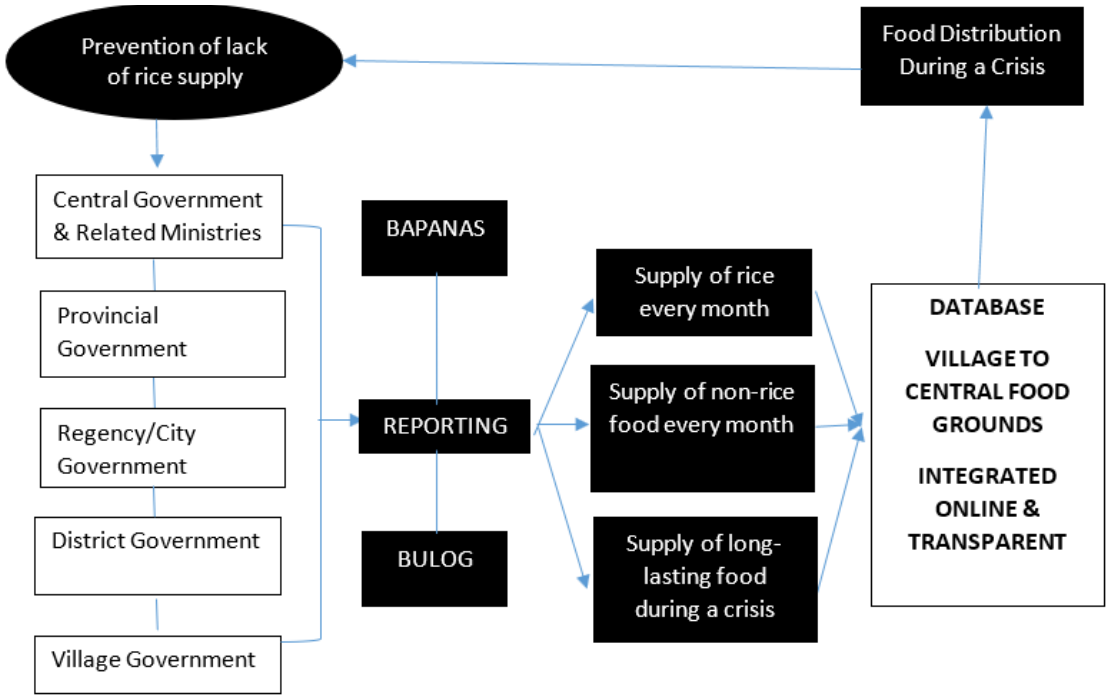

Figure 3.
Design of the integrated online food barn management system model in the Prabowo Subianto Era.

The following key points can be explained from Figure 3.

3.6. Management Information System

The proposed system includes several vital points for decision-makers in the food sector, ranging from the central government, the National Food Agency (Bapanas), Bulog, relevant ministries, and the village governments. This information system is based on comprehensive planning and organization involving human resources, such as government staff (civil servants) in related departments. In the execution phase, food storage programs can be realized effectively through government and community collaboration. The information received at each village is transparent, allowing residents to monitor the availability of rice or other staple goods through the website application [28].

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3.7. Government Involvement from Central to Villages

The central government establishes laws governing national food availability management, which are managed through an integrated online system. Based on these laws, the government can urge all regional and village-level administrations to implement the mandates. The central government's involvement down to the village level is facilitated through an online information network and physical visits from central to regional authorities [29].

3.8. Food Availability Reporting Mechanism, Especially for Rice

Each food barn, from village to national level, has staff or managers responsible for reporting the availability of rice, non-rice staples, and long-lasting essential goods via the application's menu. Monthly reports are transparently provided by village food barn staff and central government officials, allowing both village communities and the government to monitor the food supply [30].

The web-based application for the national food management information system is www.lumbungpangan.com. This application provides transparent reporting features from all food barns across Indonesia. Therefore, under Prabowo Subianto's administration, food shortages can be addressed early on, whether caused by extreme weather, crop failures, wars, or other factors.

This model design also improves the national food management system of the Jokowi administration, which introduced initiatives such as the establishment of the National Food Agency, Food Estate, and other food security programs. However, Jokowi's programs lacked transparent coordination regarding food availability, particularly from the village level to the central government.

With this application, the central government can monitor which regions have insufficient rice or other staple goods in their food barns to meet public needs during a shortage. This step is fundamental in anticipation of a food scarcity situation, where rice and other essentials may become increasingly rare in the market, as economic laws dictate. This issue is where the national food barn application becomes highly valuable, providing early prevention against undesirable events such as chaos, food conflicts, and other detrimental consequences for the Indonesian people [31].

The researcher outlines the following conditions for developing the village food barn model based on Gunawan's study [5]:

1. Existing structures, such as unused schools, vacant houses, or other village government assets, must be converted into food barns. These buildings will serve as storage sites for essential food supplies.
2. An online and offline management information system must be implemented to track and detail the village's population transparently. These systems include identifying who is well-off and has food supplies and those who are unable to provide food during a crisis. In other words, data collection should occur before a food crisis, and the village government should appoint specific food barn managers. These managers should be trusted village leaders, such as traditional, religious, or community figures, who are respected and trusted by the villagers. This effort ensures fairness in distributing free staple food, preventing potential chaos.
3. Special forces, including the military, police, and other state-appointed security personnel, should be assigned to protect the food barns both before and after a food crisis. Firm actions backed by the National Food Emergency Law will grant these forces the authority to use lethal force against looters, whether they are villagers or outsiders suffering from hunger. It is seen as better to strictly punish looters rather than wait for more significant chaos that could destroy the community.
4. There must be experts in agriculture, particularly in seed management, plant cultivation, and post-harvest technology processing. These experts will assist the village in preparing the food barn to ensure it is ready for long-term crises. Expert involvement is particularly paramount when water resources dry up, or rainfall ceases to prevent chaos due to inefficient food barn management over an extended period.

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5. The principle of mutual cooperation (gotong royong) must be fostered, where wealthier villagers with large landholdings contribute by allowing their land to be used for mass planting, aided by other villagers without land. The harvest from these lands can be stored in the food barn as reserves. Every villager must work hard to prepare the food barn before a food crisis occurs. Any villager who refuses to participate in activities such as farming, maintaining crops, fertilizing, harvesting, or processing food will be deemed in violation of the National Food Emergency Law.

4. Conclusion

This study found that food management in Indonesia still needs to address the food crisis problem. This issue is caused by the food management information system at the village and regional levels not being connected to the National Food Agency, which manages the food supply in Indonesia. The reality of the food supply chain, especially rice, is also hindered because there is no transparency, and the mechanism is carried out without an online and transparent system. With the design of an online-based food barn management model, it is expected to be able to connect the broken chain of food availability information between regions and rice reserves and other food for national food needs if there is a food shortage in Indonesia. An online-based management information system that utilizes web-based technology is connected between village food barns throughout Indonesia, which allows the government to control the available rice reserves in each period. This model is a new breakthrough in national food management, utilizing infrastructure in villages to the center through web-based online technology. This food management information system is called the Cakti Food Barn Management Information System.

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