

# Environmental policy formulation through the establishment of food reserve regulations: Opportunities and challenges

*Rahmat Teguh Santoso Gobel*<sup>1\*</sup>, *Mohamad Hidayat Muhtar*<sup>2</sup>, *Dewinta Rizky R. Hatu*<sup>2</sup>, *Ratih Ikawaty R. Hatu*<sup>2</sup>, and *Mohamad Syafri Pautina*<sup>2</sup>

<sup>1</sup>The State Islamic Institute Sultan Amai Gorontalo, Gorontalo, Indonesia

<sup>2</sup>Gorontalo State University, Gorontalo, Indonesia

**Abstract.** Research into the social and environmental effects of Gorontalo Governor Regulation No. 48 of 2019, which addresses food storage, is detailed here. This research examines the extent to which these rules are in line with environmental responsibility and social fairness through a combination of normative juridical methodologies and policy analysis. The investigation revealed that, despite the best of intentions, the policies aimed at ensuring price stability and increasing food supply fail to adequately account for the impact they would have on the environment or involve local populations. For instance, the strategy does not take into account the effects of things like agricultural production patterns on environmental degradation and climate change or the carbon footprints of various distribution methods. The policy's legitimacy and efficacy are further weakened by the limited space for public input in the design and implementation stages. The research suggests reworking regulations to incorporate criteria for ecological sustainability and public participation. This study aims to aid in the formulation of more efficient and sustainable food reserve policies by providing a more holistic understanding of food reserves as part of a larger ecological and social system.

## 1 Introduction

The Preamble to the Republic of Indonesia's (UUD 1945) Constitution lays forth the reasons for establishing the Indonesian State Government, and the National Long Term Development Plan (RPJPN) elaborates on these reasons. broad, to shape the national consciousness through education, and to aid in the establishment of a global order predicated on freedom, eternal peace, and social justice. Focusing on regional concerns is often necessary when attempting to reduce socioeconomic gaps between nations. National economies and their constituent areas have long benefited from regional growth and spatial planning initiatives [1].

The founders of our country had the lofty goal of improving people's lives. One way to accomplish this is to used one of Indonesia's greatest strengths: its agricultural sector. The growth of agriculture is crucial for securing enough food for a country's population.

---

\* Corresponding author: [rtsg@iaingorontalo.ac.id](mailto:rtsg@iaingorontalo.ac.id)

Indonesia's population is expected to rise from its current estimate of 270.20 million in September 2020 by 1.25 percent, hence the country's food reserves are crucial [2]. Indonesia's historical growth reveals that the issue of daily food security is intertwined with issues of political stability, inflation, the cost of living, and the aggregate cost of economic activity [3]. Therefore, food stocks are crucial for putting national development plans into action.

Building up food stocks is a crucial part of food security that has to be prioritised right now. Since global food stocks have dropped by almost half, the Food Security Agency has warned that Indonesia's low stockpiles might become a major issue if not addressed soon. Inadequate food storage is a result of:

- Due to the erratic weather patterns that cause floods and droughts in Indonesia, it is crucial that the country's food stockpiles be managed efficiently and effectively to prevent widespread hunger.
- Due to seasonal and geographical crop variations, food storage is essential. And
- Food stocks for post-disaster relief, food insecurity, and regional aid are essential for many emergency situations. Aside from that, food reserves can be utilised to prepare for potential food shortages brought on by the interruption or suspension of food supplies, as might happen, for instance, if natural disasters cause infrastructure and transportation facilities to collapse [4].

In this scenario, the government establishes national food reserves in accordance with Law Number 18 of 2012 concerning Food (Food Law), which highlights the importance of establishing food sovereignty, food independence, and food reserves. Government food reserves, regional government food reserves, and community food reserves make up the entirety of the country's food storage facilities; regional government food reserves are further subdivided into those for individual municipalities and provinces [5].

Successful food reserve organisation and administration require doing an inventory of the different kinds and amounts of food reserve needs, as well as estimating the likelihood of food shortages and emergencies. The purpose of government food reserves is to mitigate the effects of food scarcity, food price volatility, natural and societal calamities, and emergency situations. However, it is the responsibility of the community to ensure that its members have access to food that is adequate in quantity and quality, as well as food that is safe, diverse, nutritious, equitable, affordable, and compatible with the values held by members of the community as a whole, so that they may lead lives that are healthy, active, and productive.

Many factors affecting ecosystem stability and social welfare can be illuminated by considering food reserves in the context of environmental policy. One way in which governments can respond to calamities like natural ones or economic upheavals is by stockpiling food. Gorontalo, which is governed by Governor Regulation No. 48 of 2019 on regional government food reserves, is a particularly difficult setting in which to implement this policy.

The ecological implications of the agricultural activities that provide food reserves must be taken into urgent consideration in policymaking. The issue of the connection between food security and environmental sustainability is shown by the case of corn monoculture in Gorontalo Province, which is believed to be the source of flash floods. Soil erosion and biodiversity loss are just two of the ecological costs of growing a lot of maize in monoculture systems, which also lowers ecosystems' resistance to natural disasters [6].

The agricultural processing practices of farmers also appear to contribute to environmental harm, which is a concern stemming from the maize food crop. Farmers prepare the land for planting corn by burning it down, then treat it heavily with pesticides and fertiliser, plant highly modified seeds, and harvest using machinery that releases greenhouse gases that contribute to global warming [7]. This issue develops because most maize farmers don't know how to process their crops in a way that doesn't harm the

environment, and they focus solely on increasing output rather than considering the consequences of their actions.

The role of the community in this process is another facet that deserves investigation. Is there a place for the community to have input into the development and implementation of food reserves, even though their primary role is as producers and consumers? The legitimacy of policy is bolstered, and potential threats or opportunities are identified and addressed when the public is involved. By emphasising these many aspects, this research aims to stress that food reserve policy can become an all-encompassing environmental policy instrument in addition to a crisis mitigation tool. However, more needs to be done to make it sustainable, inclusive, and sensitive to the local context of Gorontalo for it to be effective there.

In addition, Simatupang demonstrated that local community food stocks are essential but insufficient to ensure food security for all households. In addition, food reserves at the regional level are necessary but insufficient to ensure food reserves at the community level. In the end, national food reserves are insufficient to ensure that everyone, at all times, has access to the food they need to live a healthy, productive life [8].

As you can see from the previous examples, there is no single, universally accepted meaning of "food reserves." However, the breadth and complexity of the idea of food reserves are fundamentally the assurance of sufficient food availability for humanity and the guarantee that each person would receive food on a regular basis in accordance with their needs to sustain life and engage in productive endeavors. Quantity, quality, food safety, local culture, and environmental sustainability are all important considerations that tie into the idea of insuring and providing for the dietary needs of everyone. The use of the food reserve idea must be linked to a succession of hierarchical systems according to target dimensions, beginning at the individual level in policy development and empirical research on food reserves.

In compliance with the law, food stocks are administered through a hierarchical system that includes federal, state, and local authorities. While this plan does align with the goals of sovereignty and food independence, it's crucial to keep in mind that policies involving food reserves can have serious effects on the environment. Especially when policies emphasise intensive agriculture or monoculture, as is the case in Gorontalo, ecological factors are typically left out of the empirical research that informs food reserve programs. This demonstrates flaws in the way environmental rules are formulated, specifically with regards to restrictions governing food reserves.

The concept of "Environmental Policy Formulation Through the Establishment of Food Reserve Regulations" has emerged in Gorontalo, providing an opening for the incorporation of ecological sustainability into the existing framework of food reserve policy. The chance to put sustainability and diversity more fully into practice has presented itself. Not only may more sustainable and climate-resilient agricultural methods be promoted through the food reserve policy, but also food availability and accessibility can be ensured.

Studying the role of local government and communities in establishing ecological and sustainable food reserves is a natural next step for the Gorontalo "Environmental Policy Formulation" research project. Therefore, a legal structure is required to better integrate food policy with environmental policy. To guarantee that considerations like food safety, biodiversity, and environmental sustainability are fully integrated into the food reserve strategy, a monitoring and assessment mechanism is required. As a result, Gorontalo's food reserve policy can serve as an all-encompassing environmental policy instrument in addition to its primary purpose of averting food crises.

To begin assessing these programmed, we must first examine their context within the larger environmental policy arena. Although the primary goal of food reserves is to ensure food availability in times of emergency, they also affect resource allocation, agricultural production patterns, and land use. Is there a way to assure that food production and storage

have a minimal effect on the environment, and are these rules in line with ecological sustainability?

## **2 Methods**

This study employs a research strategy that combines a normative juridical approach with a policy analysis. The legal implications of Gorontalo Governor Regulation No. 48 of 2019 and other relevant regulations will be analyzed using a normative juridical framework. Principles, norms, and legal rules form the basis of food reserve regulations, and these theoretical components are the emphasis of this strategy. Using this method, we may determine if these rules are consistent with established legal concepts and where they fall short. However, a policy analysis method would be helpful because this research also considers the environmental effects of food reserve regulations. Specifically, in regard to environmental resilience and citizen input, this analysis will shed light on the true effects of this rule. This research will analyze current food reserve regulations to determine how they might be improved by adhering to ideals of sustainability and inclusivity.

To further enrich the data and offer empirical context for the study, case studies or field observations must be used in conjunction with this method. The ecological and social challenges of implementing food reserves in accordance with the Governor's Regulation are crucial to comprehending the local dynamics in Gorontalo. Therefore, combining a normative juridical approach, policy analysis, and case studies can lead to a more thorough and in-depth examination of the potential and issues in environmental policy formulation through food reserve laws in Gorontalo.

In this study, which combines a normative juridical approach with policy analysis, data collection is done by collecting relevant regulations, such as Gorontalo Governor Regulation No. 48 of 2019, as well as other relevant legal and policy documents. The normative juridical approach involves an in-depth analysis of the principles, norms, and rules of law relating to the regulation of food reserves, ensuring consistency with existing legal concepts, and identifying shortcomings. Meanwhile, policy analysis methods focused on the environmental impact of food reserve regulation, including environmental resilience and community participation. The data processing process involves the synthesis of information from legal and policy sources, integrated with insights from case studies or field observations that provide empirical context. This case study is important to understand the ecological and social challenges in the implementation of food reserves in accordance with the governor's regulations. By applying the principles of sustainability and inclusivity, the data analysis aimed to improve the current regulation of food reserves, resulting in a deeper and more thorough understanding of the potential and problems in the formulation of environmental policies through the food reserve law in Gorontalo. This approach ensures that research covers legal, policy, and socio-ecological aspects of reality that interact in a local context.

## **3 Results and discussion**

### **3.1 Problems with regional government food reserves because of environmental policy implementation with governor regulation No. 48 of 2019**

When it comes to stockpiling food for emergencies, the Food Reserve Law stipulates two guiding principles. The formation of national food reserves was a first step toward achieving independence and sovereignty. In this scenario, food stocks are primarily sourced from within the country. Only in times of national food production insufficiency does the Central Government import food for food reserves. Secondly, the national food reserve is a

coordinated and synergistic layered reserve system made up of the following: (i) central government food reserves, which currently take the form of government rice reserves managed by Perum Bulog; (ii) regional government (provincial and district/city) food reserves, which are managed and funded by the provincial and district/city governments; and (iii) village government food reserves, which are funded by the village income and expenses.

The food situation can be expressed at the global, national, regional (regional), household, and individual levels, all through the lens of the idea of food reserves. Simatupang, meanwhile, claimed that the various levels of food storage—international, national, regional, community, family, and individual—form a hierarchical structure. In this situation, personal food security cannot be ensured by relying solely on home food storage. The allocation and preparation of food in the home, the general health of the household's members, and the general health and tidiness of the neighborhoods all play a role in how individuals and families can save food for times of need. Individual and household food stocks are also heavily influenced by other factors, such as the educational level of both husband and wife, cultural norms, and the availability of local resources [8].

Good and robust food security will have ramifications for food reserves on the national and regional levels; hence, the two notions are inextricably linked. "Food reserves are food supplies throughout the territory of the Unitary State of the Republic of Indonesia for human consumption and to deal with problems of food shortages, supply and price disruptions, and emergencies," as stated in Article 1 Point 8 of the Food Security Law.

FAQ defines food reserves as a state in which all households have the physical and economic means to procure food for all family members and are not at risk of losing either of these means [9]. Meanwhile, food reserves are conditions for meeting the nutritional needs of everyone in quantity and quality so that they can live an active, healthy life in a sustainable manner according to local culture, as agreed upon by UN member countries in the 1993 World Food Conference on Human Rights and the 1996 World Food Summit. It was also mentioned that a stable food reserve system ensures that all citizens always have access to a balanced and nutritious diet that allows for optimal growth and productivity [10].

It follows from these definitions that numerous criteria must be met for food stocks, including:

- For food to be physically accessible, three things must be guaranteed: (i) food sovereignty or independence, meaning that food production must be guaranteed based on national and local capacity; (ii) food adequacy, meaning that food production must be guaranteed in terms of quantity and availability, including reserves for basic food commodities; and (iii) a system that can guarantee that food insecurity does not occur, especially given Indonesia's geographical position.
- Financial inclusion is geared towards making sure everyone has access to nutritious meals. Therefore, it is necessary to have (i) a food commodity trading system to ensure reasonable physical and economic affordability, (ii) a distribution system to ensure that everyone can access food in accordance with their needs, (iii) price control to ensure that everyone can access food in accordance with their needs, and (iv) support for people with low economic capacity to ensure that they can get food in accordance with their needs (for example, by giving poor peasants subsidies).
- The Quality and Safety of Food The goal is to ensure that everyone has access to nutritious, contaminant-free food without compromising efforts to get more people moving and less sedentary. Implementing (i) a national food safety system, (ii) a quality assurance system in the food production process, (iii) food quality standards, (iv) the use of additional ingredients that are safe for human health, (v) a food product labelling system, and (vi) packaging arrangements can all contribute to ensuring the safety and quality of food. Because terrorist acts can be committed through food, it is important to address the threat of bioterrorism in discussions of food security.

- Healthy eating habits and respect for other cultures What this implies in practice is that everyone has access to foods that meet their dietary requirements and cultural preferences. This is why it's important to (i) regulate recommended nutritional needs and composition, like balanced nutrition; (ii) ensure halal guarantees (beliefs are respected); (iii) promote and determine food diversity; and (iv) educate the public about recommended nutritional needs.

Food policy councils (FPCs) emerged in the 1960s in the United States and Canada and have been gaining traction in Western Europe since the 2010s [11]. The announcement of the Milan Urban Food Policy Pact in 2015 was a significant step towards realising this goal since it has facilitated the formation of FPCs in several European city-regions. The Food Policy Council (FPC) is a coalition of interested parties working to reform food policy and bring about a more sustainable food system. By "sustainable," we mean a system that produces and distributes food in a way that doesn't negatively impact the environment, people's health, or their ability to make a living [12]. Therefore, FPC was created as a reaction to the rise of a corporate- and government-backed unsustainable food system [13]. Therefore, FPC seeks to adhere to democratic and open norms, bringing together actors from across the food system, including producers, regulators, NGOs, academic institutions, and consumers.

According to Law Number 18 of 2012, national food reserves are supplies of food available throughout the Republic of Indonesia for human consumption and to address issues with food shortages, supply and pricing disruptions, and crises. Both the federal government and local communities maintain food storage facilities. Central government food reserves, provincial government food reserves, city government food reserves, and village government food reserves are all parts of the government's food storage system. When it comes to stockpiling food for emergencies, Law 18 of 2012 stipulates two guiding principles [14,15].

The Food Reserve System in Indonesia comprehensively includes four sub-systems, namely: (i) the availability of food in sufficient quantities and types for the entire population; (ii) the smooth and equitable distribution of food; and (iii) the food consumption of everyone who meets the adequacy of balanced nutrition, which has an impact on (iv) the nutritional status of the community. Thus, the food and nutrition reserve system is not only concerned with the production, distribution, and provision of food at the macro level (national and regional), but also involves micro aspects, namely food access at the household and individual levels and the nutritional status of household members, especially children and pregnant women from poor households. Although conceptually understanding the Reserve [16].

The disconcerting consequences of significant global climatic changes on food production are starting to be felt in the Indonesian environment. In this situation, it is crucial to think about giving food aid from domestic sources as a locally based solution. Gorontalo Province is one such location. A very in-depth overview of how food reserves are administered at all levels of government, from province to village, may be found in Governor's Regulation Number 48 of 2019 concerning Regional Government Food Reserves. However, the public policy perspective on food issues is severely lacking because there is no provision for managing environmental impacts in this legislation.

Food price stability, scarcity prevention, and continuous supply are all fundamental to this rule's goals, and they're all worthy ones. On the other hand, the absence of laws or guidelines for incorporating environmental considerations raises several issues. In the absence of sustainable agriculture norms, for instance, efforts to expand food reserves may lead to land degradation or an increase in greenhouse gas emissions. While emergency food stocks are intended to reduce the severity of future crises, they may have unintended consequences for the ecosystem that reduce food production.

Adaptation and mitigation strategies, including climate change, natural disasters, and price changes, should be included in these policies. Rather than relying on food imports,

which may be more susceptible to global price changes and carbon emissions from transportation, it may be prudent to diversify local food sources that are more adaptable to climate change.

Environmental impacts from controlling food stocks in Gorontalo Province are as follows:

**Table 1.** Problem inventory list.

Aspect	Problem	Potential Negative Impact	Suggestions for Improvement
<b>Important Note</b>	Focus solely on ensuring food is not scarce and prices are stable	Neglecting environmental preservation efforts	giving consideration to long-term effects
<b>The Gradient of Scale in Application</b>	From the countryside to the city	Inconsistencies and inefficiencies may arise	Mechanisms for clearer cooperation
<b>Reducing Impact and Changing Course</b>	Failed to explain	Inability to prepare for climate change's consequences	Newly included alterations
<b>Control of the Lands</b>	Totally ignored	Threat to land quality and ecosystem health	Includes suggestions for land administration
<b>Indicators of Success</b>	Not a Particular Case	There are no established criteria for measuring performance	Indicator of success expanded
<b>Involvement of the People</b>	Failed to explain	Disengagement from the community	Develop means of participation
<b>Increasing Food Variety</b>	Totally ignored	Addiction to particular foods	Promote dietary variety
<b>Control and Assessment</b>	Insufficient detail	The potential for corruption and unsuccessful execution	improved monitoring system

A thorough examination of the data in the table reveals serious flaws in Governor Regulation Number 48 of 2019, which must be fixed to incorporate broader environmental and social issues in the administration of Gorontalo Province's food reserves. So, here's a more in-depth look at some of the proposals in the table:

- Including a focus on sustainability is an essential part of this approach. This requires more than just words; it requires action, such as switching to more ecologically friendly farming practices or eating more sustainably sourced foods. In the context of climate change and ecological sustainability, this may lead to a transition from reactive to proactive measures.
- Mechanisms for coordinating between different levels of government should be made explicit in policies in order to minimise inconsistencies and overlaps. Creating a centralised database that multiple stakeholders in the system have access to is one option.
- There is a pressing need for defined adaptation measures in light of the severity of climate change. More resilient infrastructure might be constructed, and local populations could be given the tools they need to adjust to environmental shifts.
- The inclusion of land management guidelines, either as a separate chapter or an appendix to the regulations, would be helpful. Methods to encourage sustainable farming and limit land degradation fall into this category.

- Including Key Performance Indicators (KPIs): The success of a programme cannot be gauged without reliable metrics. Having this metric available will improve policy review and accountability.
- Facilitating community empowerment through participation mechanisms public policy outcomes may be improved by increasing community agency. Mechanisms for clear and broad engagement will aid in this endeavour.
- Promoting Food Variety: In times of crisis, it's important to have a diverse food supply to prevent shortages. The threat can be reduced through food diversity.
- The execution of even the finest policies requires robust oversight mechanisms. For this reason, there must be a separate organisation in charge of keeping tabs on how well policies are being put into action.

It is evident from an examination of Governor's Regulation Number 48 of 2019 concerning Regional Government Food Reserves in Gorontalo Province that, despite the good intentions behind the regulation, there are several substantive weaknesses that need to be addressed in order to successfully address the issue of price stability and food availability. Inadequacies in environmental and social considerations are a key factor that necessitates revision and refinement of policy. Other crucial factors include intergovernmental coordination systems, evaluation criteria, and local community participation.

Based on the mentioned recommendations, food reserve policies should be developed and implemented with a more comprehensive and inclusive approach. This is crucial for avoiding the long-term effects of environmental degradation and climate change on the food chain, in addition to achieving short-term goals like price stability.

This research shows us that managing food stocks is not an isolated task but rather an integral part of a system with myriad interdependent ecological, economic, and social components. Following is a discussion on "Regional Government Strategy in Efforts to Develop Sustainable Food Reserves," with the expectation that greater insight into this topic would lead to more effective and long-lasting policy solutions.

### **3.2 Regional government strategy in efforts to develop sustainable food reserves**

The plan devised to stockpile food is as follows [17]:

- sustainably (at least at the pace of population growth) expanding the country's food production capacity through intensification, extensification, and diversification.
- A resurgence of seed, fertiliser, pesticide, and agricultural equipment and machinery manufacturers is essential to the success of the agricultural sector.
- Reviving the Food-Processing and Post-Harvest Sectors
- Food co-ops, small and medium-sized enterprises, and community barns need revitalization and reorganisation.
- Implementing TBT on food products, incentives, credit allocation, and harmonising import duty rates and official and unofficial taxes are all examples of policies that can help foster food independence and protect the actors involved in the food business at every stage of the supply chain.

It is the labour of the food economic system, which includes the production, post-harvest, and processing subsystems, the distribution subsystem, and the consumption subsystem, all of which interact continuously to realise food reserves. Natural resources, institutions, cultures, and technologies all contribute to the functioning of these three pillars. Only with input from locals and official oversight can this procedure be executed smoothly [18].

Beginning with food production, processing, distribution, marketing, and services, communities (farmers, fishermen, etc.) are actively engaged. Government initiatives,



including macro and microeconomic policies in trade, services, and regulation, and measures to foster the development of food independence, all contribute to making this goal more feasible. The results of achieving food independence include an increased food supply, higher-calibre human resources, larger food reserves, more economic stability, and stronger national security.

Availability, access, and absorption of food make up the three primary components of the food reserve sub-system; nutritional status is the result of food reserves. The sub-systems of food availability, access, and absorption must all be met. Good food reserves cannot be claimed for a country if any of these components are lacking. If there is a disparity in people's ability to obtain the food they require, even if there is plenty of food at the national and regional levels, food reserves are still considered to be precarious [19]:

- Subsystem availability (food availability) refers to the fact that everyone in a country has access to healthy, nourishing food, whether that food comes from the country's own production, imports, food reserves, or foreign help. Sufficient food, here understood as the number of calories required for an active and healthy existence, must be made available.
- Food access is the capacity of all households and individuals to meet their dietary requirements, whether through self-sufficiency in food production, purchasing, or receiving food aid. Economic, physical, and social access all contribute to the well-being of households and individuals. Income, job availability, and the cost of living are the determinants of economic inclusion. While the availability of food is a social issue, physical access refers to the degree of regional separation (distribution facilities and infrastructure).
- Absorption (food usage) is the process through which food is used to meet a person's physiological and metabolic requirements, as well as those for water and environmental safety. The quality of care they receive, access to clean water and sanitation, proximity to medical professionals, and nutritional education and care for toddlers all improve absorption.

There are four components that make up Indonesia's food reserve system: (i) enough food of different kinds is available for the entire population; (ii) food is distributed fairly and efficiently; and (iii) everyone eats enough. a well-rounded diet, which influences (iv) the community's overall nutritional health. Thus, the food and nutrition reserve system consider not only the macro-level (national and regional) production, distribution, and provision of food but also the micro-level (household and individual) access to food and the nutritional status of household members, particularly children and pregnant women from low-income households. Although there are micro dimensions to the meaning of food reserves,

Increasing food production is a common solution to food scarcity, although this approach isn't always eco-friendly because of things like pesticide use and land migration. More environmentally responsible farming methods should result from environmental factors being factored into the management of food stocks. To increase food availability, however, infrastructure must often be upgraded, which brings up issues of energy efficiency and carbon implications. Carbon-conscious means of distribution may be incorporated into this policy.

Finally, absorption is related to both sanitation and environmental health. Environmental policymaking should benefit from a deeper appreciation of the role that water quality and sanitation may play in the digestion of food. The major flaw of Gorontalo and Governor Regulation No. 48 of 2019 is that environmental considerations aren't given enough attention while managing food stocks. This gap in the legal debate needs to be filled without delay. Integration between food safety and environmental sustainability is not a luxury but a need, especially in a time when the promotion of sustainability is on the rise. This rule can serve as a starting point for the development of more comprehensive environmental restrictions, or at the very least allow for local adaptation that takes ecological concerns into account. This is

more in accordance with the global sustainable development model and will ensure that Gorontalo has a long-term, reliable food reserve system.

## 4 Conclusion

Even though Gorontalo Governor Regulation No. 48 for 2019 aims to stabilise food costs and availability, this analysis concludes that the policy demonstrates a number of fundamental deficiencies in considering environmental and social issues. This ranges from the environmental impacts of the agricultural production model used to the lack of opportunities for community input during the process of establishing emergency food stocks. These flaws not only threaten ecological sustainability and the environment but also undermine the legitimacy and efficacy of such programmed from the standpoint of social inclusivity and contextual flexibility. Because of this, the most important recommendation is a thorough review of this rule with input from all interested parties, including the public, in an open and honest forum. The concepts of ecological sustainability should be integrated into all parts of the policy, from production to distribution, as the primary emphasis of the revision. There also needs to be clearer metrics for gauging the performance of these policies, including their influence on the environment, as well as a system for intergovernmental and sector-related collaboration. To ensure that Gorontalo's food reserve system is both reliable and long-term, supplementary regulations can be established to promote local adaptation that considers ecological and socioeconomic considerations

## References

1. I. Suryani, M. H. Muhtar, Y. M. Rahman, B. P. M. Jaya, and A. Al Khalaf, *JURIS (Jurnal Ilm. Syariah)* **22**, 1 (2023)
2. Badan Pusat Statistik. Publikasi, Sensus Penduduk 2020 - Badan Pusat Statistik (2020)
3. R. Hanafie, *Pengantar Ekonomi Pertanian* (CV. Andi Offset, Yogyakarta, 2010)
4. S. Suroso, *J. Litbang Media Inf. Penelitian, Pengemb. Dan IPTEK* **13**, 127 (2017)
5. UU No. 18 Tahun 2012 Tentang Pangan (2012)
6. K.O. Prasetyadi, *Pertanian Jagung Monokultur Gorontalo Picu Banjir Bandang Berulang* (kompas.id, 2022)
7. B. Mamangkay, D. W. K. Baderan, M. S. Hamidun, and I. Dunggio, *Jambura Geo Educ. J.* **4**, 12 (2023)
8. H. P. Saliem and M. Ariani, in *Forum Penelit. Agro Ekon.* (2002), pp. 12–24
9. FAO. World Food Summit - Final Report (1996)
10. Badan Ketahanan Pangan, *Pedoman Teknis Pengembangan Cadangan Pangan Masyarakat* (2011)
11. A. C. L. den Boer, K. P. W. Kok, M. Gill, J. Breda, J. Cahill, C. Callenius, P. Caron, Z. Damianova, M. Gurinovic, and L. Lahteenmaki, *Trends Food Sci. Technol.* **107**, 150 (2021)
12. H. Eakin, J. P. Connors, C. Wharton, F. Bertmann, A. Xiong, and J. Stoltzfus, *Agric. Human Values* **34**, 757 (2017)
13. K. Bassarab, J. K. Clark, R. Santo, and A. Palmer, *Polit. Gov.* **7**, 32 (2019)
14. F. Kasryno and H. Soeparno, *Kemandirian Pangan Indones. Dalam Perspekt. Kebijakan. MP3EI. Badan Penelit. Dan Pengemb. Pertanian. Jakarta. Hlm* 16 (2012)

15. E. A Nanto; *Kemandirian Pangan Indonesia Dalam Perspektif Kebijakan MP3EI* (Badan Litbang Pertanian, 2013)
16. Suryana A. *Kebijakan Penganekaragaman Pangan Melalui Pemanfaatan Pangan Berbasis Sumberdaya Lokal*. In Lampung; 2012.
17. A. Suryana, in *Forum Penelit. Agro Ekon.* (Indonesian Center for Agricultural Socioeconomic and Policy Studies, 2014), pp. 123–135
18. Badan Ketahanan Pangan, *Capaian dan Tantangan Indonesia dalam Meraih Kondisi Ketahanan Pangan* (2013)
19. Direktorat Pangan dan Pertanian, *Studi Pendahuluan Rencana Pembangunan Jangka Menengah Nasional (RPJMN) Bidang Pangan dan Pertanian*. Direktorat Pangan dan Pertanian (Bappenas, 2013)