



UDC 332

## **TRANSFORMING FOOD SOVEREIGNTY POLICY IN THE CITY OF SURABAYA: FACING THE CHALLENGES OF URBANIZATION AND REALIZING SUSTAINABLE AGRICULTURE**

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### **ABSTRACT**

This research examines the challenges of food sovereignty in the city of Surabaya, focusing on adapting the concept of food sovereignty, multi-stakeholder partnerships, and developing agricultural infrastructure and technology. Mixed methods were used to collect data through observation, interviews and documentation, and then analyzed to evaluate food availability, affordability and the city's economic structure. The results show a deficit in local food production, especially rice, due to limited agricultural land and climate change, although efforts such as urban land use and crop diversification are having a positive impact. Policy innovations are proposed to strengthen food security, including agricultural infrastructure development, farmer training, and cross-sector partnerships. With collaboration between government, society and the private sector, as well as evidence-based policies, the City of Surabaya is expected to be able to overcome the local food deficit and improve the welfare of its people, contributing to sustainable and inclusive city development in the future.

### **KEY WORDS**

Food sovereignty, agricultural infrastructure, multi-stakeholder partnership, food security.

Food sovereignty is a fundamental concept in efforts to develop food that is just, sustainable, and sovereign. Food sovereignty is the right of states, nations, and individuals to independently determine food policies and systems according to their needs, potential, and culture (Sampson et al., 2021). This concept emphasizes the importance of the right to quality, sustainable, and environmentally friendly food (Kyril, 2022). The Indonesian government recognizes the importance of food sovereignty and has established policies to guarantee security and the right to food for its entire people. This policy covers aspects of supply, diversification, security, institutions, and food organization and gives the community the right to determine a food system that is appropriate to local resource potential (Duffy et al., 2021).

Since the formation of the Republic of Indonesia, fulfilling the right to food has become a priority mandated in the 1945 Constitution. Article 33, paragraph (3), emphasizes that the state is obliged to control natural resources to maximize their use for the prosperity of the people. This includes the state's obligation to ensure the availability, affordability, and fulfillment of adequate, safe, high-quality, and nutritionally balanced food consumption (Constitutional Court, 2008). In this context, agrarian reform is an important instrument for increasing food and energy security in society, with the aim of providing certainty of land tenure, improving the management of natural resources, and preserving the environment (Akhmedova, 2020).

Due to global challenges such as climate change, urbanization, and population growth, large cities like Surabaya face great pressure to maintain food sovereignty. Surabaya, as the second-largest city in Indonesia, has a strategic role in ensuring food security for its population (Okvitasari et al., 2024). However, agricultural land in this city is decreasing due



to massive urbanization and land conversion for infrastructure development. Nevertheless, the Surabaya City government has made various efforts to support food sovereignty through innovative policies and sustainable programs (Firmansyah et al., 2021). One example of a policy implemented is the use of empty land in the city for urban agriculture. Medokan Semampir Village in Sukolilo District is a clear example of how empty land belonging to government and private agencies can be used for food production. With an area of cultivated land of around 9 hectares, this sub-district has succeeded in producing food commodities such as rice, vegetables, and fruit (Puspikawati et al., 2021). This initiative not only increases local food production but also provides a source of livelihood for local residents.

The Surabaya City Government also encourages the implementation of sustainable agriculture. Sustainable agriculture is the effective management of natural resources to maintain agricultural productivity in the long term while maintaining environmental quality and the preservation of natural resources (Izzuddin et al., 2021). In Medokan Semampir Village, farmers use modern agricultural technology such as hydroponics and verticulture to optimize limited land. This system enables efficient and sustainable food production by minimizing the use of non-renewable resources and reducing the ecological footprint. However, existing policies and programs are not free from various challenges. Conversion of agricultural land into non-agricultural land, limited resources, and climate change are some of the issues that influence the success of food sovereignty policies in Surabaya. In addition, better coordination is needed between various stakeholders, including the government, farmers, research institutions, and civil society, to ensure effective and sustainable policy implementation (Putri, 2021).

This research aims to explore in depth the policies of the Surabaya City government for maintaining food sovereignty. Using policy analysis methods and in-depth interviews with stakeholders, this research will evaluate the strategies implemented, identify the challenges faced, and assess the impact of these policies on community food security. It is hoped that the results of this research can provide comprehensive recommendations to increase the effectiveness of food sovereignty policies in Surabaya and contribute to national efforts to realize food sovereignty. Effective and sustainable food policies are essential to ensuring that people's food needs are met fairly and equitably. Thus, it is hoped that this research can contribute to efforts to realize food sovereignty in Indonesia, especially in the city of Surabaya. Given the complex and dynamic challenges, a holistic and innovative approach is needed to achieve the goal of sustainable food sovereignty. This research will be the basis for developing policies that are more adaptive and responsive to global and local changes and support food sustainability for future generations.

The theoretical basis used in this research. First, the theory of sustainable food sovereignty through an agricultural ecosystem approach emphasizes the importance of wise management of natural resources, crop diversification, and the integration of modern technology. Second is the theory of multi-stakeholder partnerships to realize food sovereignty, which highlights the need for collaboration between the government, private sector, NGOs, and local communities for effective mobilization of resources, knowledge, and technology. Third is the theory of Agricultural Infrastructure and Technology Development to Increase Productivity and Food Security, which underlines the importance of adequate agricultural infrastructure support and the application of modern technology to increase production efficiency and reduce post-harvest losses.

Food Sovereignty Theory emphasizes the right of each country or community to determine their own agricultural and food policies without being influenced by international market forces (McKay, 2020). This concept emphasizes sustainable local food production, the protection of small farmers, and fair access to natural resources. Food sovereignty also underlines the importance of policies that support biodiversity, the use of technology appropriate to the local context, and the protection of the environment. Sustainable food sovereignty in Surabaya can be achieved through a holistic agricultural ecosystem approach, which includes wise management of natural resources, crop diversification, and integration of modern technology to increase agricultural productivity (Vergara-Romero, et al., 2022).



**Natural Resource Management:** The use of natural resources must be done wisely, with the application of sustainable agricultural methods such as organic fertilization and natural pest control (Li, et al., 2023). This aims to maintain soil fertility and biodiversity, while reducing negative impacts on the environment:

- **Crop Diversification:** Facing climate change and extreme weather variability, crop diversification is becoming a key strategy (Hufnagel, et al., 2020). By planting various types of food crops, vegetables, and fruit that are suitable for local climate conditions, the risk of crop failure can be minimized and food security increased.
- **Integration of Modern Technology:** Utilizing modern agricultural technology such as the Internet of Things (IoT) for smart farming can help farmers manage their land more efficiently. This technology provides information about weather, planting time, and appropriate watering doses, which contributes to increasing agricultural yields (Raj, et al., 2021).

**Multi-Stakeholder Partnership Theory** focuses on the importance of collaboration between various stakeholders in the food system, including governments, the private sector, non-governmental organizations (NGOs), local communities, and farmers (Herens, et al., 2022). This approach recognizes that challenges in the agricultural and food sectors are too complex to be solved by one party alone. Therefore, partnerships involving various actors aim to combine resources, expertise, and technology to achieve common goals, such as increasing productivity, food security, and sustainable development. The application of this technology must also be adapted to local conditions and supported by training and education for farmers. Multi-stakeholder partnerships between the government, private sector, NGOs, and local communities are keys to achieving food sovereignty in Surabaya. This collaboration enables more effective mobilization of resources, knowledge, and technology to improve food security (Thorpe, et al., 2021):

- **Government:** Acting as a facilitator and regulator, the Surabaya City government, through DKPP, must support local agricultural initiatives by providing facilities, training, and supportive policies. An example is the use of BTKD land for agriculture and urban farming (Habibi & Salam, 2021);
- **Private Sector:** The private sector can contribute through investment in agricultural technology, infrastructure, and marketing. Partnerships with the private sector can also help in developing markets for local agricultural products (Nelson, 2020);
- **NGOs and Communities:** NGOs and community organizations play a role in assisting and empowering farmers. They assist in outreach, training, and policy advocacy that supports food sovereignty. Active community participation in agricultural programs is also important for long-term sustainability (Mokgomo, et al., 2022).

**The Agricultural Infrastructure and Technology Development Theory** emphasize the importance of developing adequate infrastructure and implementing modern technology in the agricultural sector to increase efficiency and productivity (Liu, et al., 2020). Good infrastructure, such as irrigation networks, roads, and storage facilities, is essential to support food production and distribution. In addition, innovative agricultural technologies, such as drip irrigation systems, efficient agricultural tools, and information technology for precision agriculture, can help farmers optimize their crop yields and reduce post-harvest losses (Ruzzante, et al., 2021). The development of adequate agricultural infrastructure and the application of modern agricultural technology are the main strategies to increase productivity and food security in Surabaya:

- **Agricultural Infrastructure:** The development of infrastructure such as irrigation, access roads, storage warehouses, and agricultural markets is very important to increase distribution efficiency and reduce post-harvest losses. Good infrastructure supports the smooth supply chain and accessibility of agricultural products to markets (Zou, et al., 2021);
- **Modern Agricultural Technology:** The use of technology such as modern agricultural tools and machinery (e.g., hand tractor, rice transplanter, combine harvester) can increase production efficiency and reduce dependence on manual labor. In addition,



this technology helps in improving the quality of agricultural products (Yang-yang Zheng & Jia, 2022);

- Training and Technical Guidance: The capacity building of farmers through training and technical guidance is essential for adopting best agricultural practices. The Surabaya City Government, through DKPP, provides various trainings to improve farmers' competence in managing natural resources and using efficient agricultural technology (Li, et al., 2021).

## **METHODS OF RESEARCH**

This research bases its methodology on the understanding that science can be divided into two main categories, namely theoretical science and practical science. Theoretical science aims to obtain knowledge solely, while practical science studies the application of knowledge itself as its object (Zhanzhao Li, et al., 2022). In the realm of practical science, there are two main types, namely nomological practical science and normological practical science. Nomological practical science aims to obtain factual-empirical knowledge about relationships that have been patterned between two or more things, while normological practical science seeks to find relationships based on the principle of imputation on principles that link responsibility to determine what should be the obligations of certain objects in certain concrete situations (Bakti & Saleh, 2021). In this methodological framework, this research adopts a mixed quantitative and qualitative approach. The choice of mixed methods was based on the thematic content of the research title, namely "Food Sovereignty Scenarios in Medokan Semampir Village, Sukolilo District, Surabaya City, East Java Province." Quantitative methods are used to produce findings that can be measured using statistical procedures, while qualitative methods are involved to understand phenomena holistically through descriptions in the form of words and language, as well as utilizing natural methods (Mohajan, 2020).

Data collection in this research was carried out through several techniques, including observation, interviews, and documentation. Observations were carried out to obtain initial data about the research location, while interviews were conducted with key informants from various related agencies and stakeholder groups (Duan-Porter, et al., 2022). Documentation is also used as a data collection technique by analyzing written, image, and electronic documents (Dalglish, et al., 2020). By combining these various methods, this research aims to provide a comprehensive understanding of the food sovereignty scenario in the region under study.

## **RESULTS AND DISCUSSION**

The characteristics of urban areas with high populations, such as the city of Surabaya, make dependence on food distribution from the surrounding area very high (Firmansyah, et al., 2021). Industry and trade are the main economic bases, so regulating food availability does not only depend on the efficient use of limited urban land but also on regulating food distribution and community institutions (Williams, 2021). With agricultural land continuing to shrink due to infrastructure and housing development, the City of Surabaya faces major challenges in maintaining local food production (Suwarlan, et al., 2022). Rice production can only produce two harvests a year due to limited water supply in the dry season, exacerbating this situation.

Food availability in the city of Surabaya, especially rice reserves and other food alternatives such as cassava, sweet potato, peanuts, corn, and soybeans, is becoming increasingly critical (Sinaga, et al., 2020). Data shows that food production in this city varies but tends to decline, threatening the availability of rice as the main staple for most of the population. Dependence on the influx of rice from outside the region, Bulog's final stock, and an ever-increasing population make food reserve management increasingly complex. Therefore, effective food distribution arrangements and institutional development that support



food security are essential to overcome the challenges of food sovereignty in the city of Surabaya.

According to BPS Surabaya City, average population consumption decreased by 30.35% from 2019 to 2020 due to the high level of the COVID-19 pandemic, which disrupted people's consumption patterns. In 2021, there was a slight increase in consumption of 14.65% as the pandemic subsided. The following is an explanation based on production availability and assumed levels of public consumption.

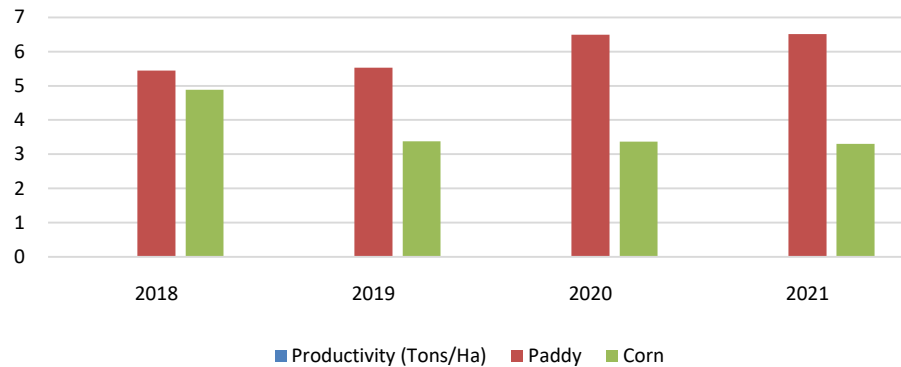


Figure 1 – Rice and Corn Productivity Achievements in the City of Surabaya

Table 1 – Productivity Value and Production Value of Main Food Commodities

| Year  | 2018                   | 2019    | 2020     | 2021   |
|-------|------------------------|---------|----------|--------|
|       | Productivity (Tons/Ha) |         |          |        |
| Paddy | 5.44                   | 5.53    | 6.49     | 6.51   |
| Corn  | 4.88                   | 3.38    | 3.37     | 3.3    |
|       | Land area              |         |          |        |
| Paddy | 1844                   | 1750    | 1854.9   | 1242.8 |
| Corn  | 82                     | 32.5    | 68.3     | 49.2   |
|       | Production (Tons)      |         |          |        |
| Paddy | 10130.64               | 9685.21 | 12042.85 | 8082.5 |
| Corn  | 400.49                 | 109.88  | 230.35   | 162.22 |

Source: Surabaya City Food Security and Agriculture Service (2022).

Table 2 – Availability of rice equivalent to rice for public consumption in the city of Surabaya

| Year | Population of Surabaya City | Amount Required/ Day |      | Number of Needs/ Year (365 days) |         | Total Rice Production/ Year | Percentage of Availability to Rice Needs |
|------|-----------------------------|----------------------|------|----------------------------------|---------|-----------------------------|--|
|      | Number of People            | Grams                | Tons | Grams                            | Tons    | Tons                        | %  |
| 2018 | 3094732                     | 965556384            | 966  | 3.52428E+11                      | 352.428 | 10131                       | 2.87%                                    |
| 2019 | 3159481                     | 985758072            | 986  | 3.59802E+11                      | 359802  | 9685                        | 2.69%                                    |
| 2020 | 2970730                     | 926867760            | 927  | 3.38307E+11                      | 338307  | 12043                       | 3.56%                                    |
| 2021 | 2970952                     | 926937024            | 927  | 3.38332E+11                      | 338332  | 8076                        | 2.39%                                    |

Source: BPS data processed (2022).

The availability of staple food in the city of Surabaya is influenced by rice production, rice coming in and out of the city, Bulog's final stock, and population. Based on analysis, with a population of 3,094,732 people in 2018, the need for rice reached 352,428 tons per year. However, rice production was only around 10,131 tons, resulting in a rice deficit. In 2019, with a population of 3,159,481 people, rice demand increased to 359,802 tons, while rice production decreased to 9,685 tons. In 2021, only 2.39% of rice needs will be met by local production; the rest will be supplied from surrounding areas. Apart from that, the City of Surabaya also relies on corn supplies from Southwest Sumba Regency through the Cattle Harvest Corn Planting Program (TJPS).

The decline in agricultural yields in Surabaya was caused by land conversion and pest attacks, which reduced the success of food production. Efforts to increase food security include pest control by involving farmer groups and the community (Sanjaya & Widayati,





2021). Apart from staple foods, Surabaya is developing horticultural crops such as vegetables, fruit, biopharmaceuticals, and ornamental plants, which are cultivated in plantations or home gardens using pots and hydroponics. However, the availability of fruit and vegetables is still not sufficient for the needs of the entire population. In 2021, only 2.91% of fruit needs and 0.15% of vegetable needs will be met by local production; the rest will be supplied from surrounding areas. Limited land and priorities for settlement and industry are the main obstacles.

The following is a situation analysis for food availability; a situation analysis that gets a value of more than 15-20% means it requires more attention in handling the condition.

Table 3 – Condition of the Food Availability Situation in Surabaya City

| No | Description                        | Year     |          | Increase/Decrease (%) |
|----|------------------------------------|----------|----------|-----------------------|
|    |                                    | 2020     | 2021     |                       |
| 1  | Rice Food Crop Production (tons)   | 12042.85 | 8076.120 | -33                   |
| 2  | Corn Food Crop Production (tons)   | 323.86   | 162.219  | -50                   |
| 3  | Fruit Crop Production (Tons)       | 3781.61  | 6763.71  | 79                    |
| 4  | Vegetable Crop Production (tons)   | 855.91   | 202.8    | -76                   |
| 5  | Livestock production (tail)        | 91609    | 23870    | -74                   |
| 6  | Pond Fisheries Production (tons)   | 7305.01  | 7943.564 | 9                     |
| 7  | Marine Fisheries Production (tons) | 8057.63  | 7805.50  | -3                    |

Source: Processed data (2022).

Food affordability includes a household's ability to obtain enough nutritious food through various sources, such as its own production, purchases, bartering, gifts, loans, and food aid. Based on Law No. 18/2012 on Food, the government and regional governments are responsible for realizing food affordability through distribution, marketing, trade policies, stabilizing the supply and price of staple foods, and food aid (Pamungkas, et al., 2020). The principle of equity demands food management that guarantees food affordability at the individual level equally, seen from physical and economic aspects (Yadav, et al., 2022). In the city of Surabaya, food affordability is implemented through stabilizing the supply and prices of staple foods, managing food reserves and distribution, which includes increasing supply stability, access to market information, and food prices, strengthening MSMEs, cooperatives, and BUMDes, developing social food safety networks, providing food for emergency situations, food independence in vulnerable areas, and an efficient food logistics system.

Table 4 – Food Affordability Situation Data

| No | Description                                  | Year   |         | Increase/Decrease (%) |
|----|--|--------|---------|-----------------------|
|    |  | 2020   | 2021    |                       |
| 1  | Number of Poor Population (Thousand)         | 145.67 | 152.490 | 4.68                  |
| 2  | Poverty Rate (Percentage of Poor Population) | 5.02   | 5.230   | 4.18                  |
| 3  | Poverty Line (Rupiah/Capita/Month)           | 592137 | 611466  | 3.26                  |
| 4  | Poverty Depth Index (P1) (%)                 | 0.87   | 0.75    | -13.80                |
| 5  | Poverty Severity Index (P2) (%)              | 0.24   | 0.17    | -29.17                |
| 6  | Number of Government Market Traders (People) | 17.242 | 14212   | -17.58                |

Source: Processed data (2022).

The economic structure of the City of Surabaya is dominated by the wholesale and retail trade, car and motorcycle repair (26.92%), and manufacturing industry (19.37%) sectors, which contribute greatly to the city's GRDP. However, the agriculture, forestry, and fisheries sectors only contributed 4.90% in 2020. Along with the increase in urban population and the decline in agricultural products such as rice, the Surabaya City Government relies on food supplies from outside the city to meet the community's food needs (Hendrati, et al., 2019). This policy is important to maintain food stability and sufficiency. In terms of food utilization and nutritional services, the Food Law emphasizes the importance of consuming diverse and nutritious food to produce quality human resources, which are essential for successful development.



Food utilization also includes safe food storage, processing, and preparation, as well as feeding habits that suit individual needs (Knorr & Augustin, 2021). This is very relevant for mothers in improving family nutrition, especially for babies and children. The quality of food consumption in Surabaya, which reflects the Expected Food Pattern (PPH) score, is very dependent on the diversity and balance of food consumption at the family level. To overcome damaged or lost agricultural production (food loss), the government provides access to information, technology, and assistance to farmers, fishermen, and livestock breeders. These efforts include outreach, providing vaccines and medicines, and pest control to increase production and food security.

## **DISCUSSION OF RESULTS**

Food availability in the city of Surabaya has experienced various significant challenges, such as limited agricultural land and climate change, which has an impact on production (Okvitasari et al., 2024). Efforts to utilize former Village Treasury Land (BTKD) parcels have been carried out by the City Government (Pemkot) through the Food Security and Agriculture Service (DKPP). Utilization of BTKD land at 18 points in various sub-districts such as Jambangan, Sumber Rejo, and Sambikerep has shown promising results, including rice harvest at Taman Surya and Surabaya City Hall in June 2022, which utilizes narrow land using urban farming techniques (Priyanti, Hardiana, & Hutasuhut, 2021). DKPP has also tried to increase production by lending agricultural tools and machinery, as well as providing seeds and other agricultural inputs. The result of this policy is an increase in rice production to 7,150.97 metric tons of harvested dry grain in 2023, which is equivalent to 3,938.04 metric tons of rice. Labor-intensive programs and assistance with modern agricultural technology, such as smart farming based on the Internet of Things, have also strengthened food security in this city. To ensure food affordability, the Surabaya City Government has renovated 11 traditional markets and developed one mini-agro-tourism vegetable village. This initiative not only ensures better food availability but also increases people's accessibility to fresh and quality food. The renovated markets include Sememi Market, Penjeringansari Market, and Nambangan Market, all of which play an important role in food distribution in the city. The Cheap Food Movement (GPM) is also an important initiative launched to stabilize food prices and ensure stocks of basic commodities are maintained, especially in commemoration of World Food Day. This initiative helps reduce inflation and provides more affordable access to food for the people of Surabaya.

According to Patton and Sawicki (1993) in the journal (Arief, Widianingsih, Bekti, & Susanti, 2022), policy innovation can be determined through forecasting and evaluation methods. Forecasting includes exploitation, modeling, and intuition, while evaluation includes discounting techniques, three measures of efficiency techniques, and sensitivity analysis. For the City of Surabaya, quantitative approaches such as Operation Research and Benefit Risk Analysis, as well as qualitative approaches such as scenarios, games, simulations and expert considerations, can be used to evaluate and determine effective policies. The following are the proposed policy innovations:

- **Sustainable Agricultural Development:** Municipal governments can promote sustainable agriculture with a focus on ecology and economics. This policy includes the use of organic fertilizer, natural pest control, and environmentally friendly planting patterns. Sustainable agriculture can improve long-term food security and the quality of life of farmers and rural communities (Pawlak & Kołodziejczak, 2020). Education, technology, government policy, and cross-sector collaboration are needed to make this happen;
- **Crop Diversification and Superior Varieties:** Considering climate change affecting rice production, crop diversification is important (Beillouin, et al., 2021). This policy supports farmers in planting various types of food crops, vegetables, fruit, and local plants that suit the climatic conditions in Surabaya. This diversification can reduce the risk of crop failure due to climate change;



- Training and Technical Guidance: Municipal governments should provide training and technical guidance to farmers to improve their competency in best agricultural practices and efficient use of agricultural technology. This training covers natural resource management and communication techniques for excellent service (Ashraf et al., 2020);
- Development of Agricultural Infrastructure: The development of infrastructure such as irrigation, access roads, storage warehouses, and agricultural markets needs to be considered. Good infrastructure can improve the distribution of agricultural products and reduce post-harvest losses (Shamdasani, 2021);
- Encouraging Agricultural Micro, Small, and Medium Enterprises (MSMEs): Developing agricultural MSMEs that can process and package agricultural products more efficiently. This policy can help farmers market their products more widely and increase the added value of agricultural products (Syahza, et al., 2021);
- Partnerships with Government, Private Sector, and NGOs: Partnerships between local governments, the private sector, and non-government organizations can support the implementation of food independence strategies. This partnership includes financing, research, and promotion of local products (Smyth, et al., 2021).

The Surabaya City Government's efforts to face the challenge of food sovereignty have shown positive results with various innovative strategies and programs. The proposed policy innovation based on forecasting and evaluation methods provides a clear direction for strengthening food sovereignty in the city. Through sustainable agricultural development, crop diversification, technical training, infrastructure development, and cross-sector partnerships, Surabaya can continue to improve food security and the welfare of its people.

## **CONCLUSION**

Rice production in the city of Surabaya has experienced a significant decline from year to year, with only 2.39% of rice needs met by local production in 2021, causing a fairly large rice deficit (2.39%). Food availability in the city of Surabaya is greatly influenced by limited local production, land conversion, and climate change, creating serious challenges for food sovereignty (climate change, land conversion).

The Surabaya City Government's efforts to increase food security have shown positive results, especially through the development of sustainable agriculture, crop diversification, and cross-sector partnerships (positive results).

The proposed policy innovations, such as developing agricultural infrastructure and encouraging the agricultural SME ecosystem, could be strategic steps in strengthening the food sovereignty of the City of Surabaya (policy innovation).

## **ACKNOWLEDGEMENTS**

The research team would like to express its deepest gratitude to University of Brawijaya, Surabaya City Government, and all related parties and stakeholders who have provided support for this research. Without their hard work, assistance, and collaboration, this research would not have been possible. Thank you for your dedication, cooperation, and contribution to increasing understanding and solutions to the challenges of food sovereignty in the city of Surabaya. Hopefully, the results of this research can be useful for city development and the welfare of its people.

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