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THE IMPACT OF GREEN REVOLUTION IMPLEMENTATION ON RICE CROP PRODUCTIVITY IN NGAWI REGENCY DURING THE NEW ORDER ERA

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ABSTRACT

The Green Revolution is a concept of modern input-based agriculture adopted by Indonesia during the New Order era to increase and accelerate production in the agricultural sector. This study aims to chronologically describe the implementation process of the agricultural intensification program and its correlation with the dynamics of rice productivity in Ngawi Regency during the New Order period. In line with national objectives, this intensification was intended to increase food crop production amidst growing population numbers. The intensification project was carried out by referring to five main efforts, including: the use of selected seed varieties, pest control using pesticides, the use of chemical-based fertilizers, the development of irrigation infrastructure, and land management improvements. This study uses an empirical analysis method based on two main sources: annual BPS (Central Statistics Agency) report data and references from scientific works related to the implementation of the Green Revolution in Indonesia. The study's conclusion confirms that the application of modern inputs resulted in fluctuations in rice production in Ngawi Regency. These findings fill a gap in the scientific literature that has not yet addressed the specific historical aspects of the Ngawi case. While this study confirms that modern inputs have universally succeeded in increasing rice yields in Ngawi, it remains limited in its exploration of social walfare–specifically regarding the actual beneficiaries of these programs during the New Order Era. Consequently, to uncover more prefound historical evidence, this study recommends further research specifically targeting the economic dimensions of this phenomenon.

Keywords: *Green Revolution, paddy crop productivity, Ngawi Regency*

ABSTRAK

Revolusi Hijau merupakan konsep pertanian berbasis input modern yang diadopsi Indonesia pada masa Orde Baru untuk meningkatkan dan mempercepat produksi dalam sektor pertanian. Kajian ini bertujuan mendeskripsikan secara kronologis prosesi implementasi program intensfikasi pertanian serta korelasinya dengan dinamika produktivitas padi di Kabupaten Ngawi pada masa Orde Baru. Sesuai dengan arah tujuan nasional, pelaksanaan intensifikasi ini dimaksudkan untuk meningkatkan produksi tanaman pangan di tengah pertumbuhan penduduk yang semakin meningkat pula. Proyek intensifikasi ini dilaksanakan dengan merujuk pada lima pokok usaha yang meliputi: penggunaan

variates benih pilihan, pengendalian hama dengan pestisida, pemakaian pupuk berbahan dasar kimia, pembangunan sarana jaringan irigasi, serta perbaikan pengelolaan lahan. Kajian ini menggunakan metode analisis empiris terhadap dua sumber utama, yaitu data laporan tahunan BPS dan referensi karya ilmiah yang berhubungan dengan praktek pelaksanaan Revolusi Hijau di Indonesia. Hasil konklusi Kajian menegaskan bahwa aplikasi input modern berimplikasi pada fluktuasi produksi padi di Kabupaten Ngawi. Temuan ini mengisi kekosongan literatur ilmiah yang belum menyentuh aspek historis spesifik pada kasus Ngawi. Dalam studi ini, secara universal memang input modern telah berhasil meningkatkan hasil pertanian padi di Ngawi, tetapi penelitian ini masih kurang dalam menyoroti aspek kesejahteraan sosial masyarakat kaitannya dengan penerima manfaat dari program ini selama masa Orde Baru. Oleh karena itu, untuk mengungkap fakta historis yang lebih mendalam, kajian ini merekomendasikan agar dilakukan kajian lebih lanjut yang secara spesifik menyasar aspek Ekonomi.

Kata Kunci: Revolusi Hijau, produktivitas tanaman padi, Kabupaten Ngawi

INTRODUCTION

Food policy during the New Order period was one of the main pillars of national development designed to transform its status from an importing country to a food self-sufficient country. To realize this idea, the central government introduced an agricultural program by carrying the concept of the Green Revolution (Nurafifa et al., 2024), which is a modern input-based agricultural system through the Mass Guidance (BIMAS) and Mass Intensification (INMAS) programs. In the program, five business lines that are integrated with each other are introduced, including: a. the use of New Superior Varieties (VUB); b. Provision of inorganic fertilizers; c. pest control with pesticides; d. development of irrigation network systems; e. and land cultivation using modern technology. In its development, in 1984, Indonesia received international recognition as a food-self-sufficient country from the *Food and Agriculture Organization* (FAO) (Sumantri & Wahyu, 2024). This award is considered the culmination of the implementation of the implementation program that has been launched since the late 1960s. In the context of Java, the geographical conditions where there are many volcanist activities and river networks that cross various regions have helped to create a good spatial climate for agricultural activities. Traditionally, people in Java have long developed farming life as a way to meet their economic needs. This activity lasted from generation to generation until it penetrated the modern era. Therefore, in the new order era, the island of Java was designated as a national rice center area, where there were a number of areas that were specifically projected to produce rice crops. At that time, Ngawi Regency emerged as one of the important areas in the national rice production map. Historically,

Ngawi has been positioned as a strategic area that has consistently contributed to meeting food needs at the local, even national level (Sumantri & Wahyu, 2024). The existence and performance of Ngawi in maintaining this role requires an in-depth historical search to fill the historical void in the study of the agricultural landscape of Ngawi Regency.

The designation of Ngawi as a national rice production center is not a baseless claim, but through evidence in the form of historical production data that shows a relative increasing trend throughout the implementation period of the Green Revolution. BPS Ngawi Regency, Ngawi in 1970 shows that rice production in Ngawi Regency in 1969 was recorded at 230,547 tons with an average yield of 4.02 tons per hectare, placing it in the top 4 in East Java. Although in certain periods of the year, especially in the mid-1970s, there was a decline in production yields, but after the improvement of the system by adopting modern inputs in a sustainable manner, rice productivity began to show a significant upward trend over the next few years. A significant increase was evident ahead of the period of food self-sufficiency, where in 1984, rice production in Ngawi had reached 401,879 tons with an average yield of 5.11 tons per hectare. More importantly, data analysis shows that Ngawi is not only able to meet local food needs, but consistently produces surplus production that is converted into supply for rice needs in a number of regions in Indonesia. This argument is strengthened by the report of the results of discussions in 1978, between LIPI and international institutions that recommended a standard of basic daily calorie needs per individual of 1900 calories (LIPI, 1978). Based on the report, the supply of rice produced by Ngawi Regency has managed to reach the surplus stage with a production ratio higher than the number of its population, even since the early days of program implementation. For example, in the self-sufficiency era in 1984, the surplus difference between the amount of production and rice needs in Ngawi was recorded at 97,991 tons. This continuous surplus condition, which continued to persist until the end of the New Order period, affirmed the role of Ngawi as a food barn that had a strong agricultural system resilience. This abundant production capacity is a direct reflection of the effectiveness of the implementation of Green Revolution elements in the region.

The resilience of Ngawi was further tested when shortly after achieving self-sufficiency in 1984, Indonesia was faced with a massive attack of brown leafhopper pests (*Nilaparvata Lugens*) (Swastika et al., 2021). This leafhopper outbreak is a severe test for the Green

Revolution program, causing crop failures and drastic reductions in rice production in a number of rice-producing areas in Indonesia. In the context of national rice farming, the pest attack had worsened the productivity trend of the agricultural sector at the end of Pelita IV (around 1986–1988). However, agriculture in Ngawi Regency shows the opposite phenomenon where directed coordination between agricultural extension workers and farmers through integrated pest control is consistently able to encourage a productive harvest cycle for rice farming. BPS Ngawi Regency, for five consecutive years since rice self-sufficiency in 1984, recorded a situation that actually showed rice production in Ngawi Regency. experienced an increase. For example, in 1987, which was a critical period of pest attacks and economic difficulties in many regions, Ngawi rice production actually reached 441,136 tons with an average yield of 5.38 tons per hectare, and recorded a surplus of 124,890 tons. The increase in production and surplus in Ngawi represents success in adaptation, pest management, or the implementation of intensification programs that require more detailed exploration. This phenomenon of yield dyspartity is not just a statistic, but a reflection of the unique local agricultural landscape, where agricultural practices successfully overcome challenges that paralyze other regions.

To clarify the uniqueness and urgency of the Ngawi case study, it is important to compare it with the experiences of other regions that run similar programs. One of the relevant studies is the Study of Lailatul Muamaroh (2017) entitled The Implementation of the Rice Mass Guidance Program (Bimas) in Tulungagung Regency in 1984-1998, which contains the realization of BIMAS in Tulungagung Regency during the New Order period. Although Tulungagung is also an agrarian area targeted by the BIMAS program, the study *exposed* the phenomenon of significant fluctuations and decreases in the number of rice, especially in the 1990s. This decline is partly due to the lack of knowledge of local farmers about the use of modern inputs. In turn, this hinders the acceptance of technological innovation from traditional to modern. In addition, it was also found that the negative impact of the intensification program was in the form of a decrease in soil fertility quality caused by the excessive application of long-term chemical inputs (Nugroho, 2018). Of course, this is a phenomenon that was born as a general consequence of the intensive monoculture practices of the Green Revolution. In addition to the problem of incompetence in the use of modern technology and land degradation due to chemical inputs, institutional issues and post-harvest

handling are also determining factors in the success or failure of agricultural programs in the New Order era. This was revealed in a study by Nunik Damayanti (2016) with the title Rice Agriculture of East Java Province During the Time of Governor Soelarso in 1988-1993 which analyzed rice agriculture in East Java Province during the time of Governor Soelarso (1988-1993). The study stated that at the end of the Pelita IV period, the East Java region experienced an average downward trend in the amount of rice production. Damayanti concluded that the decline was largely due to the ineffectiveness of the performance of the Village Unit Cooperative (KUD) as a credit distribution agency and means of production to local farmers. The performance of KUD in providing capital and absorbing crops efficiently is further exacerbated by post-harvest handling problems, such as the problem of procurement of fake seeds spread across several districts, which collectively harm farmers and reduce crop yields. This condition reflects a major challenge at the level of regional agricultural bureaucracy. On the other hand, Ngawi, which was able to maintain a surplus and increase in production until the same period, indicates that institutional and logistical problems such as the ineffectiveness of KUD and post-harvest handling may not have such a severe impact in Ngawi, or even be successfully overcome with a certain system of mechanisms.

Although there are a number of studies that explore the implementation of the Green Revolution and its impact in various regions in Indonesia, including regional comparative studies such as Tulungagung and East Java in general, there are significant gaps in the wealth of knowledge of local agricultural history. So far, there has been no historical study that specifically focuses on the phenomenon of unique rice production in Ngawi Regency during the New Order period. A number of previous studies have only concentrated on discussing crop yield fluctuations in other districts. Meanwhile, studies from a historical perspective on the phenomenon of increasing rice production in Ngawi Regency at the time of the spread of leafhopper outbreaks in various regions in Java have never been done before. In addition, this study also comprehensively analyzes how the Green Revolution policy with its modern input slogan is implemented (Gultom & Harianto, 2021). Thus, this specific study of local areas can have a positive impact on the historiographic void about the agricultural history of Ngawi Regency in the aspect of rice productivity during the New Order period.

Substantively, the contribution of this study is not only limited to the addition of historical data, but also provides valuable historical insights into the agricultural landscape of rice plants in Ngawi Regency, a topic that is still quite rarely discussed in the context of scientific studies. This study presents a detailed and tested historical narrative based on empirical data in the form of data from the Central Bureau of Statistics, scientific literature that specifically highlights the phenomenon of rice farming in the New Order period and a comparative literature review that serves as a basic material to find the location *of research gaps* that need to be filled in the historiographic aspect. This study has significance for the development of historiography with local nuances because it offers a new perspective on the factors that affect the successful implementation of the Green Revolution. This is because today, agricultural historiography in the New Order era is often dominated only by narratives that depart from a critical paradigm on the negative effects of the implementation of the Green Revolution (Andrianto, 2023). Thus, this discovery can add to the treasury of agricultural history, as well as open up a public dialectic space to deconstruct the classical agricultural model in pursuit of a sustainability-oriented modernization system. Thus, efforts to enrich perspectives on food security and technological adaptation at the local level will be easier to do, as this study provides a data foundation and historical narrative about Ngawi as a resistant area, so that it can be a starting point for future comparative studies. By analyzing how Ngawi managed to become a resilient rice center, this study contributes to a richer and more balanced understanding of the dynamics of Indonesia's agricultural development, of course, by including a number of empirically testable scientific evidence.

METHOD

The study of this scientific article began from early November to mid-December 2025 using a historical methodology that includes four systematic steps, including the collection of sources relevant to the theme of the study (heuristic), criticism of both internal and external sources (verification), interpretation of sources that have been scientifically criticized (interpretation, and reconstruction of related events textually or historiographically (Sukmana, 2021). At the beginning of the study, various relevant sources were collected as a database for the creation of articles. The data of this study uses the annual report released by the Central Bureau of Statistics (BPS) as the primary source. Basically, this study aims

to explain the quantitative aspect of the productivity of rice farming products in Ngawi Regency in the New Order era in a historical framework that connects political policies with the implementation of the Green Revolution program which shows the existence of dynamics in the form of fluctuations in agricultural yields. This study utilizes *online platforms* as a medium to obtain valid sources such as the BPS official library website and the Google Scholar site. In the tracing process, there is a sufficient amount of data to be carried out so that it is easier for researchers to formulate how to reconstruct related historical events. In addition, the abundance of BPS published sources also makes it easier for researchers to connect evidence causally. The BPS data in question is a report compiled by BPS Level II (Regency) and BPS Level I (province). The use of BPS data at the provincial level is actually more of a filling of data gaps that cannot be found in the annual report of BPS at the district level. On the other hand, in the aspect of secondary sources, scientific literature data is used in the form of a past study of the history of rice farming in Indonesia during the New Order period which then functions as a framework to see various phenomena that have occurred during the implementation of the Green Revolution which allows the opening of new pages for the writing of agricultural history in Ngawi Regency. At the verification stage, in sorting and determining data sources that are considered valid are based on the principles of legality and logic. Legally, BPS is an official body tasked with recording national development data quantitatively to be an indicator of the success rate of government programs as well as a fundamental reference for the formulation of new policies in the future (Hartanto & Yuliani, 2019). With this status, BPS can be considered for its integrity in processing regional level data. Thus, the use of data from BPS can be justified because of the strong legality element attached to it. However, the researcher also has a critical note of the data released by BPS, this is related to the difference in information presented in the annual report between BPS Ngawi and BPS East Java, where sometimes both contain different information in the context of production results for the same year. To overcome this problem, in order to avoid incorrect information, information sourced from the BPS Ngawi report was chosen because hierarchically data collection uses *the bottom-up method,* which is to position BPS at the district level as the earliest institution to obtain data from civil society (Maidah, 2024). In addition, the next step of criticism is carried out by comparing the data output of BPS with the literature of historical scientific articles that contain narratives of certain phenomena that

occur in the condition of rice farming in Ngawi Regency. At this stage, causality logic is used to check how compatible (rational) the BPS data is with the previous article that mentions the narrative of certain phenomena that occur in the Ngawi agricultural sector. This is done because it contains great significance for the process of reconstructing historical events, where previous research can be used as a tool to validate the issues raised in an article.

In the interpretation step, the existence of secondary data has a vital role in helping the process of reconstructing past events. The presence of secondary sources in the form of relevant scientific literature is used as a guide in determining the flow of agricultural history during the New Order period in Ngawi Regency. In accordance with its function, scientific articles have a crucial position in which they contain narratives about various phenomena that have occurred in the past. In the context of interpretation, this helps the researcher in connecting the data that has been obtained from BPS with the data of previous articles so as to create a logical historical narrative. After that, the study is closed with the last step, namely historiography, which is the stage of writing history based on the construction of events built through the interpretation process (Arifin, 2023). As for the fact that this study is historical research, the form of this paper uses a historical-descriptive approach based on quantitative data.

DISCUSSION

The Green Revolution is a development concept in the field of agriculture that seeks to change farming methods from traditional to modern systems, which are based on the use of modern inputs as instruments to increase agricultural production. Historically, the concept of the Green Revolution was first initiated by Rockefeller through his research institute specifically designed to increase the amount of wheat production in Mexico in 1944. As a result, since then, wheat productivity in Mexico has increased every year, even in 1956, the country was able to meet its own domestic needs. A few years later, in 1964, the increase in wheat agricultural output was followed by other successes, where Mexico's trade sector was recorded to have exported half a million tons of wheat production to foreign countries (Ameen & Raza, 2017). In Indonesia, the introduction of the concept of the Green Revolution began with an experiment conducted by a student from the Bogor Agricultural Institution (IPB) who was conducting KKN activities in Karawang in 1963. There, through

demonstration plot activities , he managed to get more than twice as much agricultural crop yield compared to conventional agricultural products (Rinardi et al., 2019). Based on these findings, the demonstration plot mechanism has begun to be implemented in a number of provinces in Indonesia. In the New Order era, along with the increase in production in a number of provinces that had tested this method, the government then adopted it into an official program known as Mass Guidance (BIMAS). BIMAS was established as the state's official agricultural procedure based on the Decree of the Ministry of Agriculture No. 546/kpts/12/org/1969 with the aim of improving the welfare of farmers through intensification efforts (Rinardi et al., 2019).

The implementation of the agricultural intensification program carried out by the New Order government emerged as a response to the monetary and food crisis inherited by the previous government (the Old Order). The food crisis conditions that hit Indonesia have prompted the government to improve the national food procurement system by making rice the main commodity to maintain economic stability which affects political legitimacy (Azahra et al., 2024). Historical facts show that East Java is one of the most important rice barn areas which can be illustrated by its impact on Indonesia's food supply since the beginning of the Green Revolution. A comparison of East Java's rice productivity in the period 1963 to 1969 shows a striking disparity that is politically closely related to policy changes at the national level. This phenomenon certainly has a direct impact on economic stability which previously experienced a major paralysis, where production stagnation in the agricultural sector is a serious challenge to the food security of the population on a large scale (Yunus et al., 2016). In the period from 1963 to 1965, when it was still in the midst of political instability and hyperinflation during the Old Order (Maulidia et al., 2023), East Java's agricultural sector showed stagnant and unsatisfactory performance. In this four-year period, rice production in East Java only ranges from 2 to 3 million tons. Limited technology, minimal agricultural inputs, and poor irrigation distribution management are the main factors behind the phenomenon of low agricultural product productivity.

Table 1

Rice production in East Java Province in 1963-1969

Year	Rice production (tons)

1963	2.951.027
1964	3.201.238
1965	3.391.358
1066	3.330.281
1967	3.304.214
1968	4.404.385
1969	4.312.317

Source: BPS Level I East Java Province in 1971

A significant turning point began to occur in 1969 when the agricultural intensification program was inaugurated. The data recorded a massive surge in East Java rice agricultural products, which was identified with production achievements that exceeded 4 million tons. This increase can be attributed to the expansion of the initial adoption of new superior varieties (VUB) such as IR8 and IR5 which are the result of collaboration with *the International Rice Research Institute* (IRRI) (Styawan, 2022), as well as the implementation of the *demonstration plot* mechanism which is the forerunner of the BIMAS program. *The demonstration plot* serves as a field laboratory that convinces farmers of the advantages of modern methods (the use of chemical fertilizers, pesticides, and VUB) in increasing yields. This sharp increase in food production is directly related to the efforts to stabilize the macroeconomic economy by the New Order government. This step was taken following the economic crisis that had hit Indonesia, where as a result of this phenomenon, Indonesia was once in a phase of experiencing high inflation (*hyperinflation) to touch a* percentage of 650% as an accumulation of errors in monetary decision-making by the Old Order government. However, along with the success of growing food production through intensification, the inflation rate was successfully suppressed to a decrease in percentage to 13% in the late 1960s (Farawita, 2018). The contribution of agriculture in suppressing inflation is very large, where the increase in domestic rice supply has made the prices of a number of basic necessities decrease, which then has an impact on macroeconomic stability. Therefore, the surge in rice productivity in East Java during the period of the development of the New Order government is not just a record of agricultural statistics, but a vital indicator for the initial success of the direction of New Order development.

The Early Era of the Implementation of the Green Revolution Program

The success in increasing rice productivity in East Java is a strong background for the expansion of the intensification program to all regions, including Ngawi Regency which has a geographically strategic land character. This is evidenced by the existence of two major rivers, namely, the Bengawan Solo and the Madiun River which cross villages in the western, central, and eastern parts of the Ngawi Regency area. This geographical situation allows Ngawi to become a suitable area to develop agricultural activities, especially rice which has long been the focus of the main commodity. In addition, this spatial situation also encourages the government to take advantage of this geographical advantage as a basis to build a number of irrigation networks to support production activities in the agricultural sector. According to the records of BPS East Java Province in 1971, Ngawi already has an agricultural irrigation line that irrigates an area of 40,425 hectares of rice fields. This condition is an ideal representation to analyze the implementation of the Green Revolution at the regional level. The implementation of the Green Revolution in Ngawi Regency began through the Mass Guidance program (BIMAS), where the technical implementation was mandated directly to BULOG as a field companion with the task of providing directions on the procedures for implementing the intensification program. Before entering the program application stage, the central government had first issued Presidential Decree No. 11 of 1969 which emphasized that the implementation of the intensification program was directly under the command of BULOG as a technical at the lower level. This regulation marks a change in the role in the agency's functionality, where previously it only had the domain of authority to ensure that national rice food stocks are fulfilled as a mitigation effort to avoid a food crisis. In the historical context, following the data of the BPS report of East Java Province in 1970 and 1971, the agricultural phenomenon in Ngawi shows a structured and gradual implementation stage. In the first year of its implementation, the BIMAS program in Ngawi is focused on introducing basic technology packages to farmers. This program is basically a continuation of the demonstration plot method that has been proven to be successful in increasing rice productivity trends. The main components include: a) Introduction of rice varieties with high yield capacity that are responsive to fertilizers; b) Distribution of Urea and TSP fertilizers; c) The use of several types of pesticide variants; d) Provision of cheap credit through Bank

Rakyat Indonesia (BRI) for the purchase of production facilities (Mahendra & Anwari, 2024).

In Ngawi Regency, at the beginning of its implementation, there were symptoms that showed production fluctuations. This is based on the 1976 BPS Ngawi Regency report which noted that the average ratio of crop yield per hectare (productivity) shows a fluctuating trend. This problem is basically closely related to the dependence on chemical inputs, both fertilizers and pesticides, both of which are core components of the Green Revolution concept (Ariyadi, 2025). Citing data from the BPS report of East Java Province, in 1969-1970, there was an increase in rice harvest following the distribution of chemical inputs along with the supply distributed by the authorities. For example, in the context of the distribution of urea fertilizer, in 1969, Ngawi Regency received a quota of around 407 tons, then in the following year the supply increased to 1950 tons. This had a rapid impact on the productivity trend which then increased, even in that year (1970) the demand for rice per capita recorded a surplus with a supply capacity of 184 kg for each individual in Ngawi. However, in 1971, after producing good production output in the previous year, the pattern of dependence on chemical inputs on the one hand had a destructive impact on cultivated land that forced farmers to intensely use these modern products. The problem in the future that arises is the increase in production costs, which makes farmers start to complain about costs along with fertilizer prices that are not always stable and pest attacks that have mutated (Ariefiansyah, 2018). This certainly has a direct impact on the production rate which indicates a decline which makes some farmers choose the option of returning to traditional farming methods because in terms of production costs it is cheaper compared to modern methods affiliated with the government. The following is a table of rice crop productivity in the first three years of the implementation of the Green Revolution program in Ngawi Regency.

Table 2

Rice Production in Ngawi Regency 1969-1971

Year	Programs	Harvest area (ha)	Production (tons)	Rice supply per Soul (kg/yr)
	BIMAS	17.126		

1969	INMAS	5.750	232.597	168,75
	Non-program	34.416		
	BIMAS	24.606		
1970	INMAS	12.500	260.513	184,133
	Non-program	17.683		
	BIMAS	20.453		
1971	INMAS	11.988	246.549	163
	Non-program	35.043		

Source: BPS Ngawi Regency in 1976

Improvement period of agricultural intensification program components

In the period 1972–1973, Indonesia was hit by a long drought situation that caused national agriculture to experience ups and downs in production. In addition, the existence of leafhopper pests that are spreading more widely also adds to the negative record for the rice agriculture sector. Such conditions often cause crop yields to decline in terms of quantity and quality. As a result, when the harvest is taking place, many farmers lose money because consumers tend to choose to buy the best quality products. In overcoming these problems, one of the ways taken by the government is to enact new regulations through the issuance of Presidential Instruction No. 4 of 1973, which regulates the supervision of Village Unit Cooperatives (KUD), which in principle expands the authority of the institution not only to collect grain, but also ensure that farmers get market guarantees with competitive purchase prices so that they can provide maximum profits for farmers. This is a responsive step by the government after the issue that the purchase price at the farmer level is monopolized by middlemen who often buy products at relatively low prices, which in turn has implications for farmers' ability to prepare production costs for farming activities for the next planting season (Sumantri & Wahyu, 2024). Therefore, in determining prices, the government sets the basic purchase price which is adjusted every year based on the development of the economy

that is being faced. Thus, when the harvest is taking place, the potential for price falls can be more anticipated.

In 1974, rice farming in Indonesia was still plagued by various problems like previous years which were specifically dominated by plant diseases originating from external factors. This problem is related to the existence of pests, one of which is leafhoppers with an increase in population every year (Baehaki, 2012). Plant diseases caused by leafhoppers in Indonesia are directly proportional to government policies that seek to modernize the agricultural system. However, this method requires farmers to change a number of agricultural components to modern inputs that rely on the use of chemical elements, including the use of New Superior Varieties (VUB), the application of inorganic fertilizers, and pest control by spraying pesticides on plants. In accordance with the initial idea, the use of modern inputs is intended to intensify the scale of the quantification of national agricultural production in order to maintain food security. In addition, in the broader economic context, the surplus of food crop cultivation is also intended to have a significant financial influence on the state treasury. This was represented at a historic moment when Indonesia was named a food self-sufficient country in 1984 by the FAO, even the success was followed by an event when Indonesia was able to export its rice commodities to a number of countries including Vietnam which at that time was hit by a rice supply deficit (Tempo, 2019).

The New Order with its various political manifestos, one of which seeks to increase agricultural production, in reality, the idealism instilled by the government through the agricultural intensification program does not always run smoothly as expected. This is evidenced by the amount of rice harvest area in Ngawi during the period 1974-1977 which relatively showed a decline in terms of average yield—indicating that the ratio between production and land area occurred in a large *gap*. This problem arose because of the use of chemical inputs that were used massively to give rise to the phenomenon of soil conditions experiencing stagnation which led to a decrease in the quality and quantity of rice production. In addition, excessive spraying of pesticides also had an effect on the birth of a new type of brown leafhopper that began to infect widely in 1974. The emergence of this new leafhopper biotype is inseparable from the process of leafhopper evolution, where populations that are able to adapt to unstable natural conditions have succeeded in giving birth to types with genomes that are more resistant to chemical drugs. This incident forced farmers to switch

from the use of old seed varieties (IR 5 and IR 8) to the use of Superior Leafhopper Resistant Varieties IR 36 which were specifically designed to anticipate the existence of new biotypes that have evolved (Wijayanti et al., 2018). For comparison, referring to BPS report data, in 1969, the number of insecticides supplied by the government to farmers reached 14,112 liters, this figure then increased to 22,610 liters in 1974. This distribution activity is a strong indication that there is an increase in the quantity in the use of chemical inputs as a pest control medium. Regarding the application of urea fertilizer, the supply has touched 10,073,388 tons in 1974, while in 1969 the number only reached 407,832 tons. This overuse makes a number of soil organisms responsible for loosening the soil slowly become extinct which ultimately also affects other organisms that act as natural predators for pests (Yulia, 2019).

In the next development, in order to increase the production of rice plants which have stagnated in recent years, the government has made various overhauls to overcome the problems that have arisen. Several new breakthroughs have been made by the government through concrete actions manifested in the development of agricultural facilities such as the construction of water dams (dams) and technical irrigation networks in many areas of rice-producing areas. On the other hand, in the aspect of seedling, in 1977, the government was recorded to have changed rice seed varieties that are more resistant to weather challenges and pests visualized in IR 36 varieties which are known to be resistant to attacks of biotype 1 and 2 brown stem leafhoppers (Wijayanti et al., 2018). Not only that, the government also promotes Integrated Pest Control (PHT) procedures led by field extension workers to optimize the intensification goals to be achieved. In Ngawi, after structural changes were made to the planting system using leafhopper pest-resistant varieties (VUTW), the trend of gradually declining agricultural product production could be overcome properly. For comparison, in 1977, when there was land damage due to pest attacks which reached an area of 23,791 hectares, Ngawi was only able to produce 218,493 tons of rice production on an area of 67,209 hectares. This trend increased much further in the following year when in 1978, the figure increased dramatically to 308934 tons. Although it had decreased in the 1979 period, which was 286,024 tons, in the following year for five consecutive years, Ngawi set a productivity record that always increased per year. As for the period 1980-1984, the production figures were 312,416 tons, 354,640 tons, 369,444 tons, 376,293 tons, and 401,879

tons. This phenomenon reflects the indication of relative success in the production aspect in the context of overcoming the massive crop failure that occurred in Ngawi before the introduction of IR 36 seed varieties.

The pace of rice production in Ngawi district in the first half of the 80s was inseparable from the massive physical development carried out by the government to support access to water that reaches the rice fields. In the context of the development of agricultural facilities in the irrigation sector, the central government collaborates with the Public Works Office (DPU) as the main implementer in the procurement of projects that correlate with the development of irrigation network systems to make it easier for farmers to get access to water. The development of irrigation is one of the main determining factors whose effect is directly proportional to the opportunity to produce large quantities of agricultural products. In 1974, it was recorded that DPU had been involved in the procurement of an interintegrated irrigation network that was able to reach an area of rice fields of more than three million hectares on a national scale. Then, in 1977, the DPU had taken care of the construction of an irrigation project with an area of about 4,377,000 hectares (Nurvianto & Trilaksana, 2014). In Ngawi, the use of the existence of irrigation networks produced by the DPU has had a progressive impact on the rice crop agricultural sector. Development related to water supply in Ngawi basically does not only dwell on procurement carried out by the DPU, but also by other parties outside the department. In turn, the existence of a number of irrigation networks has a big impact on the trend of increasing rice crop productivity.

Table 3

Land area affected by technical irrigation of DPU Ngawi Regency in 1976-1980

Year	Types of irrigation fields DPU (ha)		
	Technical	Half-technical	Simple
1976	20.113,412	4.592,974	43.969,326
1977	62,577,306 (combined number of DPU irrigation types)		
1978	24.856,717	7.888,445	3.050,267
1979	26.952,75	11.426,95	4.401,40

Source: BPS Ngawi Regency in 1976, 1977, 1978, 1979

The era towards food self-sufficiency

In the early 1980s, in an effort to grow rice productivity oriented to food self-sufficiency, in addition to creating an irrigation network and the use of superior varieties, the government also encouraged the use of modern mechanization in rice field plowing activities. This effort is carried out as one of the representations of the Green Revolution slogan, one of which is the use of tractor technology as an instrument to carry out more efficient land cultivation, both in terms of time, energy, and performance (Zain, 2025). As additional information, the use of tractors has also been proven to increase farm yields by 5-10 quintals per hectare, this is because the tool can loosen the soil more optimally (Nurvianto & Trilaksana, 2014). In the era before 1980, rice field ploughing activities were carried out using the mode of livestock in the form of cows or buffaloes. However, there is a trade-off that must be paid, namely related to the need for a longer time allocation compared to the modern way that is manifested in the use of tractors. In Indonesia, the existence of tractors has actually been officially introduced since 1973, but its use has not been too massive because the purchase price is considered too high by farmers. It was only in the 80s that the use of tractors began to be common in Indonesia. This is none other than the government's credit policy which makes it easier for farmers to get access to capital to buy modern plow equipment so that efforts to increase the quantity of rice production can take place more intensively (Muamaroh, 2017). In the context of the realization of its distribution, the BIMAS and INMAS (Mass Instruction) programs that have been designed by the New Order government as an intensification implementation program, also carry out another role to distribute soft credit assistance in the form of premiums to farmers through KUD agencies that have been established in each village. In Ngawi, the program encourages agricultural mechanization, such as the use of hand tractors and water pumps, especially in areas with adequate irrigation potential. As a result, the increase in production began to have an impact on the local surplus which allowed Ngawi to contribute to the national rice stock. For comparison, in the BPS record in 1979, the number of two-wheeled tractors distributed in Ngawi was only 35 units. However, in 1980, the government then issued Presidential Decree No. 36 which contained the provision of premiums through KUD intermediaries. As a result,

in the early 1980s, the number of tractors increased rapidly. The following table represents an increasing trend of ownership of tractor production modes.

Table 4

Number of tractors in Ngawi 1982-1985

Year	Number of tractors	
	Two-wheeled tractor	Mini four-wheeled tractor
1982	137	2
1983	167	1
1984	162	6
1985	197	0

Source: BPS Statistics of East Java Farming Tools 1982-1983 and BPS Statistics of East Java Farming Tools 1984-1985

Post-food self-sufficiency era in 1984

After going through various process dynamics for many years in order to increase the amount of rice production to achieve food self-sufficiency, in 1984, Indonesia was named as a country that was able to meet domestic needs by the FAO organization, even managed to penetrate the surplus phase in the same year. The success in meeting this food need is marked by the existence of a national rice reserve supply of two million tons (Ariska & Qurniawan, 2021). This allows Indonesia to carry out export activities, especially in the context of rice commodities abroad. Instead of only exporting to get visa benefits for the state treasury, the government at that time chose to donate some of the reserves to humanitarian missions to help the food crisis that hit people in Africa where the number reached 100,000 tons of rice (Raditya, 2018). In the next development, after being declared food self-sufficiency which marked the peak of the implementation of the Green Revolution in Indonesia, in the following years, namely between the period 1986-1989, a number of agricultural areas in Indonesia were again hit by crop failure caused by the brown leafhopper pest that again attacked

Indonesia. This surge is allegedly strong because there has been degradation of agricultural land due to the use of massive chemical inputs that are not in accordance with the applicable guidelines (Hanifah et al., 2024). However, in the context of rice crop production, Ngawi Regency has shown an upward trend in five consecutive years since rice self-sufficiency in 1984. This phenomenon is an indication that agriculture in Ngawi Regency has managed to maintain a positive trend at a time when other regions are struggling to overcome the massive spread of leafhopper outbreaks. Such conditions occur inseparable from the role of extension officers who encourage the implementation of IR 36 seeds as superior rice seeds resistant to leafhoppers so that the production of rice plants can continue to increase for several years after the rice self-sufficiency period.

Table 5

Trends in rice crop productivity in Ngawi Regency 1984=1989

Year	Rice productivity		
	Area (ha)	Production (tons)	Average yield (tons/ha)
1984	78.588	401.879	5,11
1985	80.771	425.151	5,26
1986	80.832	426.269	5,27
1987	81.976	441.136	5,38
1988	82.892	483.071	5,82
1989	86.297	484.459	5,61

Source: BPS Rice Production in East Java 1971-1985, BPS Ngawi Regency in 1985 Figures, BPS Rice Production in East Java 1986, BPS Rice Production and Palawija in East Java 1987, BPS East Java in 1988 Figures, BPS East Java in 1989 Figures

Since the 1984 food self-sufficiency era, Ngawi has only experienced production declines in 1990, 1991, and 1994, which respectively have production figures of 454,508 tons, 439,656, and 469,066. Despite the stagnation of yields, the production of rice crops inscribed by Ngawi since the period of food self-sufficiency has never caused a deficit for the domestic needs of the Ngawi region. On the other hand, rice farming in Ngawi always

experiences a surplus despite the presence of leafhopper pests that cause crop failures in some parts of the Ngawi Regency area. This phenomenon cannot be separated from the increase in water irrigation development programs and credit programs that have made tractor ownership increase rapidly. For example, in 1995 the two-wheeled tractor ploughing mode in Ngawi had penetrated the ownership figure of 443 units, a high number compared to the pre-food self-sufficiency era in 1984. In the irrigation sector, in the early 1990s, the government also boosted the irrigation facility development program, one of the results of which was manifested in the physical facilities of the Pondok reservoir in the East Ngawi area (Aida & Utomo, 2019). Meanwhile, during the implementation of the Green Revolution program, the period in which Ngawi managed to reach the highest production point occurred in 1997 with a harvest of 548,500 tons of dry grain in a harvest area of 87,748 hectares. However, in the following year (1998), after the New Order government collapsed due to the failure to overcome the monetary crisis, which was characterized by high inflation rates (from 11.10 percent to 77.60 percent) (Shaleha et al., 2024). In the context of agriculture in Ngawi Regency, the phenomenon of the monetary crisis that hit Indonesia had a major impact on the condition of rice farming which only managed to produce 547,532 in an area of 96,750 hectares. This condition is also the worst record for the rice crop sector in Ngawi since the implementation of the Green Revolution with an average yield drop of 9.6 percent from the 1997 period.

In the historical perspective of Ngawi Regency, the implementation of the Green Revolution by the New Order government was an early marker for the modernization of the agricultural sector. Although it had experienced difficulties in adapting to the use of modern inputs, after 1977, after the introduction of the IR-36 product, the trend of rice crop production in Ngawi Regency began to move in a progressive direction. In achieving the target of food self-sufficiency, Ngawi also built a number of agricultural facilities such as irrigation networks that have expanded every year since the implementation period of the Green Revolution. In the 1980s, the increasing number of ownership of tractor ploughing modes also had a major impact on land productivity, thus having direct implications for production. At its peak, after the period of food self-sufficiency in 1984, Ngawi continued to maintain the trend of increasing crop yields at a time when other areas were being hit by leafhopper pests. However, in 1998, when Indonesia was hit by a monetary crisis, this

condition directly affected the increasingly expensive cost of agricultural production which in turn caused the dynamics of rice crop production to decrease in yields.

CONCLUSION

The Green Revolution is a visionary concept that wants to change agricultural activities from traditional to modernity that emphasizes the application of modern inputs with the aim of increasing crop yields. In Indonesia, the Green Revolution was first implemented during the New Order government. This implementation is aimed at Indonesia achieving a phase of food self-sufficiency, especially in the agricultural sector. In its implementation, there are five business principals known as Panca Usaha Tani. Its components include; a) The use of superior seed varieties b) The use of inorganic fertilizers and pesticides c) good land cultivation using modern tractor tools d) pest control with pesticides e) and the construction of irrigation network facilities. Officially, through Presidential Decree No. 11 of 1969, Indonesia began to carry out the Green Revolution program by establishing Mass Guidance (BIMAS) as an instrument that provides procedural guidance. In addition, as the organizers, BULOG and KUD were appointed and deployed as field extension workers. In its development, Indonesia succeeded in holding the status of a rice self-sufficient country in 1984 declared by FAO, which was marked by BULOG's success in securing national rice stocks with an amount of up to three million tons. In Ngawi although statistically managed to achieve high productivity to produce a surplus every year, it does not mean that the agricultural landscape of Kabuaten Ngawi runs without obstacles. In 1974, after experiencing crop failure due to land degradation and the evolution of leafhoppers into biotypes 1 and 2, which increasingly widened, where one of the affected areas was Ngawi, production in the rice agriculture sector also experienced a sharp downward trend. In turn, this condition caused Ngawi's agricultural production to be paralyzed for about three years. However, thanks to government policies that have set the basic price for the purchase of agricultural products, farmers can still get maximum profits through sales to KUD. The year 1977 was a turning point period for Ngawi Regency which was marked by the distribution of VUTW IR 36, which was a new superior seed specially designed to be resistant to the attack of brown stem leafhoppers who were increasingly resistant to chemical inputs. Since the use of the latest seed varieties, rice productivity in Ngawi Regency has begun to show an increase in

crop yields. In fact, in the data compiled by BPS, from 1978 to the period of 1984, which is considered as a period of food self-sufficiency, agriculture in the Ngawi area almost always recorded a consistent upward trend (except for 1979 on a national scale). Not to mention that after the provision of premiums from the government in 1980, the number of ownership of tractor ploughing equipment has increased many times. This condition allows farmers to cultivate the soil more efficiently in terms of time, labor, and production because the use of tractors can loosen the soil better compared to simple tools such as hoes. The trend of Ngawi rice productivity is still increasing in yield per year even in the midst of a climate of many crop failures in several other areas after the era of food self-sufficiency. Although there was a stagnation in production in the 1990, 1991, and 1994 periods, the figure was not too significant. It was only in 1998, when there was a monetary crisis in Indonesia that had an impact on the increase in the inflation rate, the rice commodity in Ngawi Regency experienced a sharp decline with a percentage decrease of up to 9.6 percent. In conclusion, the productivity trend of rice crops in the New Order era was determined by a number of factors including the determination of the basic price by the KUD, the use of superior varieties of IR-36, the creation of irrigation networks, the addition of modern agricultural equipment, the use of chemical products such as pesticides and chemical fertilizers, and the construction of dams. In short, through this study, it is hoped that it will be able to become a good initial foundation to sharpen historical studies, especially in the spatial scope of Ngawi Regency during the New Order period

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