

ANALYSIS OF REGIONAL AND INCOME DISPARITIES IN NGANJUK REGENCY: A STUDY BASED ON THE WILLIAMSON INDEX AND GINI INDEX

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ABSTRACT

This study addresses the issue of identifying regional disparity analysis, specifically to provide an overview of the level of development disparity in Nganjuk Regency in relation to welfare levels. By examining the income disparity of the population across regions, we can gain insights into the performance success of the economic development in Nganjuk Regency. This can serve as a foundation for future regional economic development planning. The research method employs descriptive analysis using secondary data from the Central Bureau of Statistics (BPS) of Nganjuk Regency, East Java Province, and Indonesia. The calculations of inter-regional income inequality through the Williamson Index and inter-household income inequality through the Gini Index both conclude that there is a rising trend of income inequality in Nganjuk Regency from 2022 to 2023. This increase in income inequality may be attributed to the economic slowdown in 2023, which impacts both regions and income groups, thus exacerbating disparities between regions and among individuals/households.

KEYWORDS Regional Disparities, Williamson Index, Klassen Typology, Gini Index



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INTRODUCTION

Economic growth is one of the primary indicators that reflect the impact of development initiatives undertaken by the government, especially in the context of economic advancement. High and sustained economic growth is often regarded as a benchmark for the success of national development. However, behind these achievements lies a fundamental issue of concern: regional and income disparities. Regional disparity refers to differences in welfare levels and economic development between regions (Saudi, 2021). Income disparity, on the other hand, is the gap between high-income and low-income areas (Manueke, Walewangko, & Lopian, 2024). This inequality occurs not only between households or individual

How to cite:

E-ISSN:

Berliyan. Et all (2025). Analysis of Regional and Income Disparities in Nganjuk Regency: A Study Based on the Williamson Index and Gini Index. Journal Eduvest. Vol 5 (3): 3403-3415
2775-3727

income earners but also across regions (Nolan, Richiardi, & Valenzuela, 2019). Disparities arise due to an increasingly uneven distribution of income (Sayifullah, 2021). This phenomenon poses a classic challenge for many poor and developing countries, including Indonesia.

Even high economic growth often does not significantly reduce poverty, indicating that such growth has not been inclusive or equitable (junasdi Said, Subagiyo, & Wijayanti, 2021). Regional disparities in Indonesia remain one of the major challenges in national development. These disparities are particularly pronounced between the Western Region of Indonesia (KBI) and the Eastern Region of Indonesia (KTI), where the latter lags in development compared to the former (Sumirat, 2019). Furthermore, regional disparities are also evident in the presence of underdeveloped areas in several districts and sub-districts. These differences stem from disparities in natural resource availability and demographic conditions in each region (Zofan, Wicaksono, & Wijayanti, 2023). Consequently, significant gaps exist between developed regions and relatively underdeveloped ones.

To measure the level of economic welfare disparities between regions, one commonly used indicator is per capita Gross Regional Domestic Product (GRDP). Thus, efforts to reduce interregional disparities are crucial to achieving sustainable and equitable development across Indonesia.

Nganjuk Regency, located in East Java Province, is a region with great economic potential. As an agricultural region, the agricultural sector is the backbone of the economy, especially with leading commodities such as shallots that have been exported to various regions in Indonesia. In addition, the industrial and trade sectors are starting to develop along with the development of strategic infrastructure such as toll roads and double track railways. However, despite its significant economic potential, Nganjuk Regency still faces challenges in terms of equitable development and income distribution between regions.

Regional and income disparities are an important issue in Nganjuk Regency. This inequality can be seen from the different contributions of economic sectors to the Gross Regional Domestic Product (GRDP). The agriculture, forestry, and fisheries sectors remain the largest contributors to GRDP, while the industry and services sectors are still developing slowly. This inequality is also influenced by the geographical condition of Nganjuk Regency, which consists of lowlands to mountains, creating disparities in access to economic resources.

This study focuses on analyzing regional disparities in Nganjuk Regency to provide a deeper understanding of the development disparity levels and their relation to community welfare. By identifying differences in income levels across regions, the study aims to evaluate the extent to which local government economic development efforts have succeeded in reducing disparities. The findings of this

analysis are expected to serve as a solid foundation for regional economic development planning, ensuring that inclusive and sustainable economic growth can be achieved throughout Nganjuk Regency.

RESEARCH METHOD

Type of Research

This study employs a descriptive analysis approach, aimed at systematically and comprehensively describing the data collected without making generalizations. According to Sugiyono (2014), descriptive analysis is a statistical method used to analyze data by presenting information as it is, thereby providing a deeper understanding of the characteristics of the phenomena being studied. This approach was chosen because it aligns with the study's objective: to depict the level of regional disparity and development outcomes in specific areas based on existing data. Descriptive analysis allows researchers to explain patterns, trends, or differences in the data without involving complex hypothesis testing. In this study, the data analyzed includes economic and social indicators, offering a clear picture of the conditions in the studied region.

Data

This study utilizes secondary data as the primary source to achieve its objectives. Secondary data refers to information previously collected and organized by other parties, such as official records, reports, or publications, which can be reused for analysis in this research. Secondary data was chosen due to its availability, allowing researchers to focus on data analysis without the need for direct information collection.

In this research, secondary data was obtained from various official publications, including Nganjuk Regency in Figures, East Java Province in Figures, and Key Macro Socio-Economic Indicators of East Java Province. These sources provide relevant and comprehensive information on the economic, social, and demographic conditions of Nganjuk Regency during the study period, 2014–2023. This timeframe was selected to identify long-term trends and patterns in the region's development.

By leveraging secondary data verified by official institutions, this study aims to produce accurate and in-depth analyses, contributing significantly to understanding the economic development dynamics in Nganjuk Regency.

Methodology

Income inequality in this study is categorized into inter-regional and inter-household/individual inequality. Inter-regional income inequality is measured using the Williamson Index and Klassen Typology, while inter-household inequality is measured using the Gini Index.

Williamson Index

The Williamson Index is used to measure income inequality between regions. The formula yields an index value greater than or equal to 0, with higher values indicating greater inequality (Tingkat, 2019).

Williamson Index Formula:

$$IW = \sqrt{\frac{(Yi - Y)^2 - fi/n}{Y}}$$

Explanation:

IW : Williamson Index
Yi : Per capita GRDP of district/city *i*
y : Per capita GRDP of the province
fi : Population of district/city *i*
n : Population of the province

Klassen Typology

Klassen Typology is used to analyze economic growth patterns and structures in various regions. It compares the economic growth of districts/cities with provincial growth as a benchmark and assesses per capita GRDP growth across regions (Masbiran, 2019). This typology divides regions into four quadrants based on two main indicators: economic growth (vertical axis) and average income (horizontal axis):

1. Quadrant 1: Fast-growing and advanced regions with higher economic growth and income than the district/city average.
2. Quadrant 2: Developing regions with high growth but lower per capita income than the district/city average.
3. Quadrant 3: Advanced but pressured regions with higher per capita income but lower economic growth than the district/city average.
4. Quadrant 4: Relatively underdeveloped regions with lower growth and per capita income than the district/city average.

Gini Index

The Gini Ratio or Gini Index measures the degree of income distribution inequality in a region (Khoirudin & Musta'in, 2020).

Gini Index Formula:

$$GR = 1 - \sum fi [Yi + Yi - 1]$$

Explanation:

Fi : Percentage of income received by class *i*

Y_i : Cumulative percentage of income in class i

The GR value ranges from zero to one. If $GR = 0$, it indicates perfect income equality, meaning everyone receives the same income. If $GR = 1$, it indicates perfect income inequality, where income is concentrated in the hands of a single individual or group.

According to Todarjo's criteria:

- A Gini Ratio between 0.50 and 0.70 indicates severe inequality.
- A Gini Ratio between 0.36 and 0.49 indicates moderate inequality.
- A Gini Ratio between 0.20 and 0.35 indicates relatively high equality (even distribution).

RESULT AND DISCUSSION

The disparity map between regencies/cities, based on economic performance three years after the COVID-19 pandemic crisis, reveals that several regions in East Java, including Nganjuk, have shifted into the relatively underdeveloped category. Notably, Nganjuk still relies on the primary sectors of agriculture, forestry, and fisheries, which experienced significant deceleration in 2023. Alongside Pacitan, Ponorogo, Trenggalek, and 25 other regencies in East Java, Nganjuk's slow economic recovery post-2020 crisis and the 2023 economic slowdown are the main contributing factors. Each region or sub-region has diverse potential and conditions (Noviyanti, Emma Pravitasari, & Sahara, 2020)

Table 1. Nganjuk Regency in the Regional Development Map of East Java
Regencies/Cities Based on Klassen Typology, 2021-2023

Economic Growth vs. Higher PDRB per Capita		PDRB per	Lower PDRB per Capita		
Higher Growth	Economic	Developing Areas:			
		Rapidly Growing and Developed Areas:		1. Pasuruan	
		1. Sidoarjo		2. Mojokerto	
		2. Malang City		3. Bojonegoro	
		3. Surabaya City		4. Gresik	
				5. Madiun City	
				6. Batu City	
Lower Economic Growth		Advanced but Stagnant Areas:		Relatively Underdeveloped Areas:	
		1. Tuban		1. Pacitan,	
		2. Kediri City		2. Ponorogo,	
				3. Trenggalek,	

Economic Growth vs. Higher PDRB per Capita	PDRB per Lower PDRB per Capita
	4. Tulungagung,
	5. Blitar,
	6. Kediri,
	7. Malang,
	8. Lumajang,
	9. Jember,
	10. Banyuwangi,
	11. Bondowoso,
	12. Situbondo,
	13. Probolinggo
	14. Jombang
	15. Nganjuk,
	16. Madiun,
	17. Magetan,
	18. Ngawi,
	19. Lamongan
	20. Bangkalan,
	21. Sampang,
	22. Pamekasan,
	23. Sumenep,
	24. Blitar
	25. Probolinggo City
	26. Mojokerto City

Nganjuk is classified as a relatively underdeveloped region with lower economic growth and PDRB per capita than the East Java average. The economic conditions of Nganjuk contrast with Kediri City, categorized as an advanced but stagnant area. The shift in Klassen Typology highlights the need for the Nganjuk Regional Government to enhance the performance of high-potential economic sectors, creating added value and job opportunities to improve labor force participation rates (LFPR).

Table 2. Sectoral Disparities Based on Klassen Typology in Nganjuk Regency, 2021-2023

Sectoral Contribution vs. Growth	Higher Contribution	Sectoral Lower Contribution	Sectoral
Higher Sectoral Growth	Rapidly Growing and Developed Sectors: Agriculture, forestry, and fisheries; Water supply, waste management, and recycling; Developing Sectors: Construction; Information and Manufacturing industry; communication; Real estate; Accommodation and Government administration, food service, defense, and mandatory social security; Education services; Health and social work activities.		
Lower Sectoral Growth	Relatively Underdeveloped Advanced but Stagnant Sectors: Mining and Sectors: Wholesale and retail quarrying; Electricity trade, motor vehicle and and gas supply; motorcycle repair; Other Transportation and warehousing; Financial and insurance activities; Business services.		

This table highlights sectoral disparities in Nganjuk Regency. Eight sectors fall under the rapidly growing and developed category, indicating potential for growth. Regions with better resources generate higher incomes, leading to disparities in income distribution (Hayati, Wicaksono, & Dinanti, 2023).

The developing sector comprises only two areas: the manufacturing industry and accommodation and food and beverage provision. Advanced but pressured sectors include: (1) wholesale and retail trade, motor vehicle and motorcycle repair, and (2) other services. Meanwhile, other sectors fall into the lagging sector category. The COVID-19 pandemic crisis, post-pandemic sectoral developments relative to pre-pandemic conditions, and the economic slowdown in 2023 have altered the sectoral map according to the new Klassen typology. Additionally, sectors with relatively small contributions also experienced limited growth, placing

them in the lagging category, which includes: (1) mining and quarrying, (2) electricity and gas supply, (3) transportation and warehousing, (4) financial and insurance services, and (6) corporate services. To promote growth and contributions of potential sectors, appropriate policies and strategies focusing on improving productivity, efficiency, and competitiveness in each sector are necessary (Ibramsyah, Ramadan, & Kusumawati, 2024).

Besides Klassen Typology analysis, the Williamson Index measures regional inequality by considering GDP per capita and population. Figure 1 illustrates that the Williamson Index for Nganjuk Regency has remained relatively stable. A slight increase occurred from 2022 to 2023. The first observation indicates that the COVID-19 pandemic reduced regional inequality in Nganjuk Regency, with a decrease from 2019 to 2020. Stability continued until 2022, followed by an increase in 2023 due to the economic slowdown, which affected regions variably. The Williamson Index suggests a trend of stable regional equity in Nganjuk Regency. This aligns with the Gini Index trend, which increased from 2021 to 2023. Regional inequality significantly decreased in 2020 due to the pandemic-induced recession, remained stable until 2022, and rose again in 2023, likely due to high inflation that year. The economic slowdown, particularly affecting economic sectors and income groups, also contributed to the Gini Index increase in 2023.

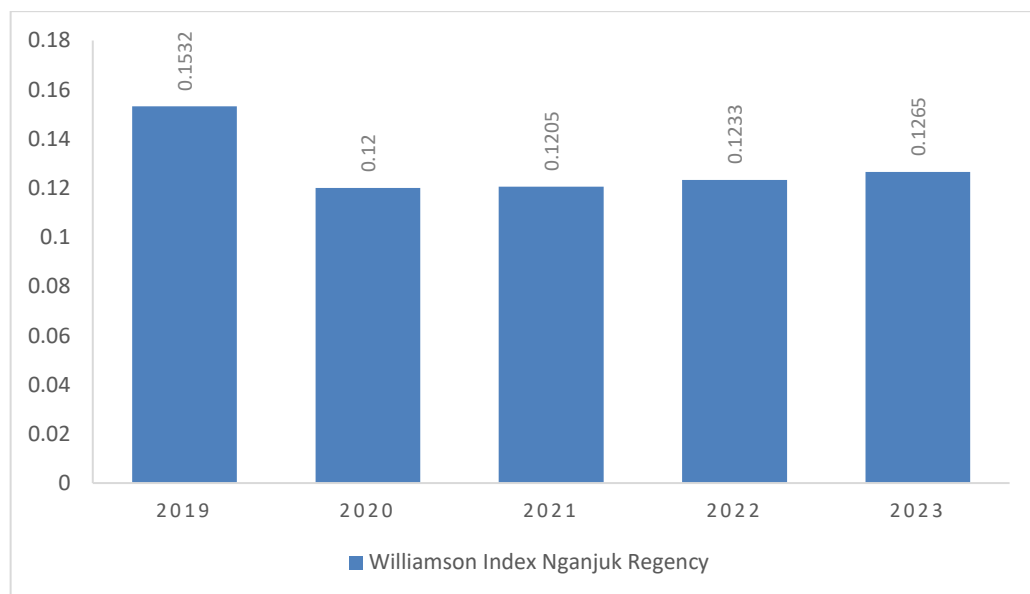


Figure 1. Williamson Index in Nganjuk Regency (2019–2023)

When compared to East Java Province, Figure 2 shows that regional disparities in Nganjuk Regency remain relatively low with a stable trend. Meanwhile, regional disparities in East Java Province have continuously increased from 2021 to 2023. This indicates a rise in regional inequality within East Java

Province. Differences in regions, policies, and budgets for regional development contribute to disparities in regional development.

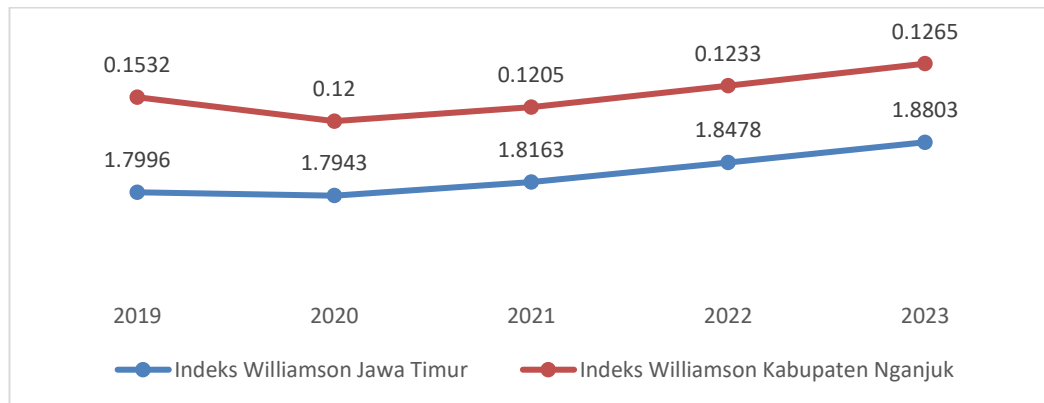


Figure 2. Trends in the Williamson Index and Comparison between Nganjuk Regency and East Java, 2019–2023

Based on the Williamson Index in Figure 2, there is a stable trend or regional equity in Nganjuk Regency. Regional disparities decreased significantly from 2019 to 2020, then slightly increased from 2020 to 2021 due to the economic recession caused by the COVID-19 pandemic. The disparities remained stable until 2022, with a slight increase, reaching 0.1233 in 2022. This inequality arises because certain subdistricts are still categorized as relatively underdeveloped in the Klassen analysis. Additionally, high inflation impacts the real income of low-income residents, making them vulnerable to declines.

The economic slowdown in 2023 also contributed to increased inequality due to sectoral shifts in the Klassen Typology and diverse per capita income changes among subdistricts in Nganjuk Regency. The uneven economic income highlights the need for specific strategies to improve the economy in low per capita income areas (Hidayah & Tallo, 2020).

In Figure 3, it is shown that in 2023, the expenditure percentage of the bottom 40% of low-income residents was approximately 15.18%. The expenditure percentage for the middle 40% income group was 25.36%, while the top 20% high-income group accounted for around 59.46%.

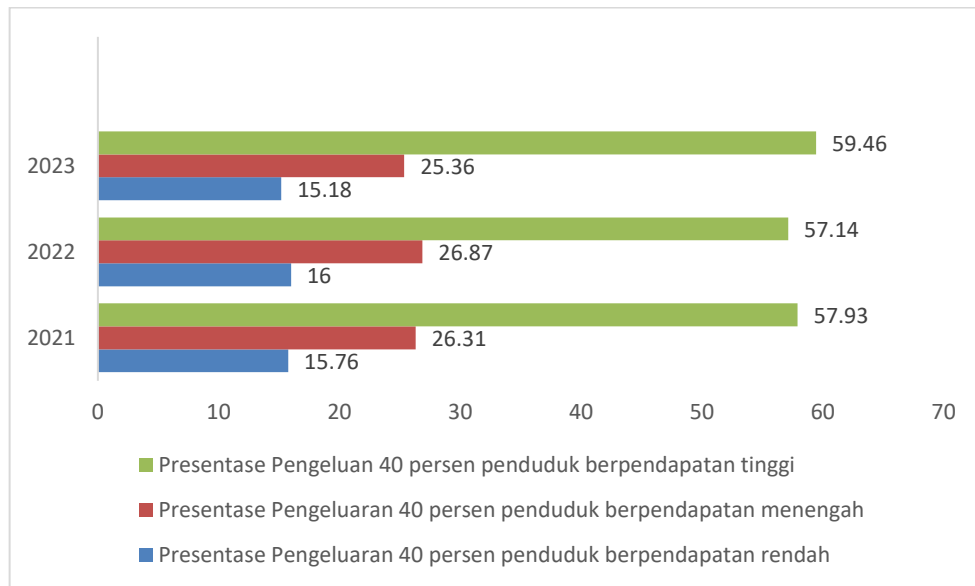


Figure 3. Expenditure Percentage According to World Bank Criteria in Nganjuk Regency 2021–2023

Expenditures by the bottom 40% of low-income residents in Nganjuk Regency decreased in 2023 compared to 2022, as did the middle 40% income group. Although the expenditure percentage for the bottom 40% of residents did not meet the World Bank criteria indicating a minimum threshold ($<17\%$), overall, income inequality increased due to higher expenditures by the top 20% high-income group. There was an increase in income inequality from 2022 to 2023, with expenditures for the bottom 40% of residents decreasing from 16.00%. The overall increase in the expenditure percentage for the top 20% of high-income residents resulted in a tendency for greater inequality.

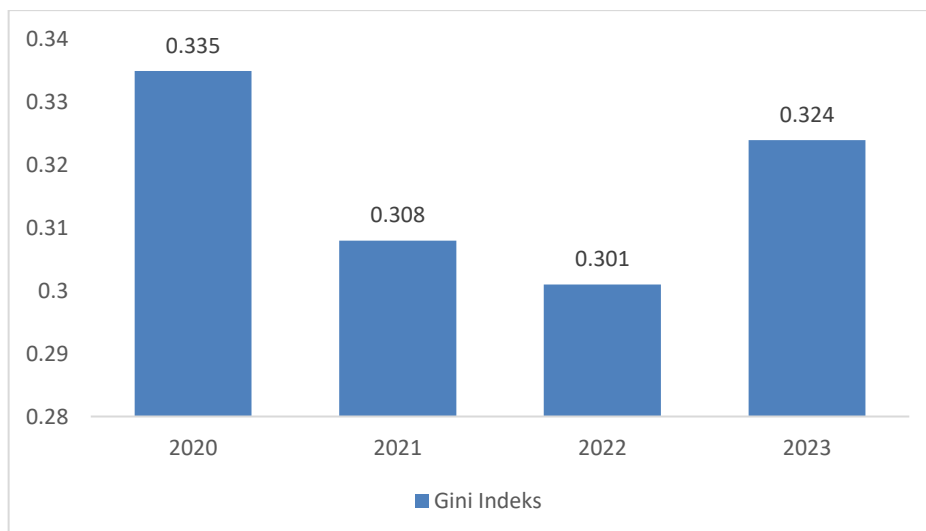


Figure 4. Gini Index of Nganjuk Regency 2020–2023

The Gini Ratio is used to analyze data and measure income inequality, expressed as a ratio ranging from 0 to 1 (Saputra, 2018). Stable income inequality is further supported by the Gini Index, which decreased from 0.308 in 2021 to 0.301 in 2022, as shown in Figure 4.

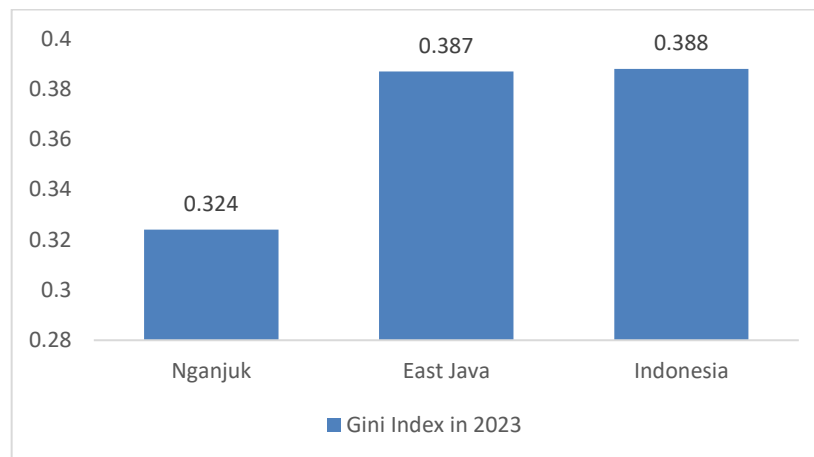


Figure 5. Gini Index of Nganjuk Regency and Comparisons with East Java and Indonesia in 2023

Overall, when compared to the provincial and national levels, Nganjuk Regency has the lowest inequality compared to the East Java and the national level. The calculations of interregional income inequality using the Williamson Index and household income inequality using the Gini Index yield the same conclusion: an upward trend in income inequality in Nganjuk Regency from 2022 to 2023. The increase in income inequality is attributed to the 2023 economic slowdown, impacting interregional and household income groups, thus amplifying disparities. Although poverty rates declined, the poverty depth and severity indices rose, thereby increasing household income inequality.

CONCLUSION

Based on the study, Nganjuk Regency is classified as a relatively underdeveloped area according to the Klassen Typology for 2021-2023, with per capita GRDP growth lower than the regional average in East Java. Sectoral disparities reveal that the developing sectors include manufacturing and accommodation and food services, while advanced but stagnant sectors consist of wholesale and retail trade, motor vehicle repair, and other services. Several sectors, such as mining, electricity, transportation, financial services, and business services, remain underdeveloped due to their low contributions and growth rates. Furthermore, income inequality in Nganjuk increased from 2022 to 2023, as shown

by the Williamson Index and Gini Index, due to the economic slowdown that impacted both regional and household income groups. Although poverty levels declined, the depth and severity of poverty rose, exacerbating income disparities between households.

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