

HUMAN RESOURCE MANAGEMENT STRATEGIES IN FACING CHANGES IN THE POPULATION DEPENDENCY RATIO IN INDONESIA: PROJECTIONS 2025-2035

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Abstract: The background of this study focuses on the demographic challenges faced by Indonesia, especially related to the population dependency ratio which has the potential to affect the effectiveness of human resource (HR) management in various sectors. The purpose of this study is to analyze the projected population dependency ratio between 2025 and 2035 and its implications for sustainable human resource management strategies. The methods used include secondary data analysis from official sources and statistical modeling to predict demographic trends and their impact on the labor market. The results show that there is significant variation in the dependency ratio in each province, with some regions facing higher burdens, which can affect the availability and quality of labor. The discussion emphasized the importance of developing adaptive HR policies, including training and upskilling programs, to prepare the workforce for demographic changes. The novelty of this study lies in the integration of demographic analysis with HR management approaches, providing new insights for the development of strategies that are responsive to market needs. The output of this paper is expected to be a guide for stakeholders in formulating effective HR management policies and practices, in order to improve the competitiveness and sustainability of organizations in Indonesia.

Keywords: Human Resource Management, Population Dependency Ratio, Demographic Projections, Adaptive Strategies, Workforce Development

1. Introduction

Significant demographic changes in Indonesia, especially in terms of population dependency ratio, are becoming an increasingly urgent issue to pay attention (Richardson, 2023). The dependency ratio, which measures the proportion of the economically inactive population (children and the elderly) to the active population, has direct implications for social and economic policies, including human resource (HR) management (Chowdhury, 2023). In projections between 2025 and 2035, it is expected that there will be significant variations in the dependency ratio in different provinces, which may affect the availability of labor and the need for human resource development programs (Stahl, 2020).

Supporting data suggest that some provinces, such as East Nusa Tenggara and Maluku, will experience high dependency ratios, while other provinces may face the opposite challenge (Yusoff, 2020). This creates uncertainty in workforce planning and HR development, which in turn can affect the productivity and competitiveness of the organization (Wongsansukcharoen & Thaweepaiboonwong, 2023). The chronology of this problem began with changes in birth patterns and an increase in life expectancy, which led to an increase in the number of elderly people and a decrease in the proportion of the productive age population. The mismatch

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between the needs of the job market and the availability of skilled labor is a challenge that must be faced by organizations (Gerhart & Feng, 2021)

As a solution, this study aims to explore and formulate an adaptive and responsive HR management strategy to changes in the population dependency ratio (Šebestová & Popescu, 2022) With a data-driven approach and practical insights, this research will provide concrete recommendations for organizations in designing HR policies that not only take into account the current demographic conditions, but also prepare them to face future challenges (Syaiful Anwar¹, 2022) Through a better understanding of demographic dynamics, it is hoped that organizations can improve the effectiveness of human resource management and contribute to sustainable economic development in Indonesia (Zhang & Chen, 2023)

The novelty of this paper lies in an interdisciplinary approach that integrates the analysis of projected population dependency ratios with adaptive human resource management strategies, as well as providing practical data-based recommendations to face demographic challenges in Indonesia in the 2025-2035 period.

2. Literature Review

Population Dependency Ratio

The population dependency ratio is one of the important demographic indicators in analyzing the population structure of a country (Skirbekk, 2022) This ratio describes the comparison between the number of unproductive population (i.e. the population under 15 years old and over 65 years old) with the productive age population (between 15 to 64 years old) (Cervin, 2020) The dependency ratio is often used to evaluate the economic burden that productive age groups must bear in supporting the needs of unproductive age groups (Murray, 2021; Ramage, 2021)

The higher the dependency ratio, the greater the pressure on the productive age population to support the living needs of the non-productive age group, both in terms of economy, health services, education, and social security (Choi, 2021) On the other hand, the lower this ratio, the greater the potential that a country has to take advantage of the demographic bonus—a condition in which the proportion of the productive age population is greater than that of the non-productive age population (G. Li, 2021; Mitra, 2020)

In the Indonesian context, changes in the population dependency ratio are greatly influenced by various factors, such as an increase in life expectancy, a decrease in the birth rate, and other socio-economic changes (Wilson, 2020) This phenomenon indicates that there are challenges and opportunities for the government and the private sector in managing human resources effectively. One of the challenges that arises is how to prepare adaptive HR management policies and strategies in the face of this change in demographic structure, especially in responding to the increasing number of elderly population and declining birth rates that can have an impact on the workforce in the future (Chong, 2023; Lomax, 2020; Lukyanets, 2021) By understanding the population dependency ratio, policymakers can design appropriate interventions, such as improving the quality of education and training for the workforce, reforming the social security system, and developing policies that support the participation of older groups in the workforce (Reed, 2021) This is crucial so that Indonesia can optimize its economic growth in line with ongoing demographic changes (Ro, 2022).

Human Resource Management Strategy

Human Resource Management (HR) Strategy is a systematic and sustainable approach used by organizations to manage and optimize employee potential to be in line with the strategic goals

of the company or institution (Papademetriou et al., 2023) In a broader context, this strategy plays an important role in ensuring that the existing workforce is able to meet market challenges and dynamics, and contribute optimally to the organization's long-term success (Article et al., n.d.-b)

There are several key elements that are generally the focus of an HR management strategy.

1. Employee recruitment and selection.

Organizations need to ensure that they recruit individuals who have the skills, competencies, and values that align with the organization's needs (Article et al., n.d.-a) The proper selection process involves not only evaluating technical skills, but also includes assessing the employee's potential to develop in the future (Zhang & Chen, 2023)

2. Employee development and training.

In an ever-changing world, skills and competency development is an important priority in HR management strategies (Šebestová & Popescu, 2022) Organizations must invest in continuous training to improve the quality of the workforce, both through technical training and soft skills development. This development program aims to increase productivity, innovation, and maintain employee competitiveness in the global market (Syaiful Anwar1, 2022)

3. Performance management.

This strategy involves setting clear targets, monitoring employee progress, and evaluating performance periodically (Mohiuddin et al., 2022) By using the right performance management tools, such as competency-based assessments, organizations can ensure that employees are operating according to the expected standards. In addition, effective performance management can also aid in the identification of individual and team development needs (Gerhart & Feng, 2021)

4. Employee retention.

One of the important aspects of HR management is retaining potential and talented employees (Wongsansukcharoen & Thaweepaiboonwong, 2023) This retention can be achieved through the provision of appropriate incentives, a conducive work environment, and attractive career development policies. By maintaining high retention rates, organizations can minimize costs associated with hiring and training new employees, as well as maintain team stability (Zhong et al., 2021)

In addition, HR management strategies also include change management. In the midst of rapid global change, organizations must be able to adapt to a dynamic business environment, including changes in technology, regulations, and market expectations (Aburumman, 2020) In this case, good HR management will help organizations manage change effectively by involving employees in the transition process, providing the necessary training, and supporting them in facing new challenges (Šebestová & Popescu, 2022)

So a successful HR management strategy is one that is able to create a balance between business needs and employee well-being. By ensuring that employees feel valued, supported, and given opportunities to grow, organizations will not only improve overall performance, but also build a positive and sustainable work culture (Syaiful Anwar1, 2022)

Demographic changes in Indonesia

Demographic change in Indonesia is a complex phenomenon and reflects a structural shift in population composition that is influenced by various factors, such as birth rates, deaths, and migration (Cole, 2023) These changes have far-reaching impacts on various sectors, including the economy, health, education, and social policy. One of the significant demographic changes

in Indonesia is the declining birth rate and the increase in life expectancy, which has resulted in an increase in the number of elderly people (Rodrigues, 2020)

This phenomenon is also known as the demographic transition, in which there is a shift from high birth and death rates to lower birth and death rates (Qi, 2022) In Indonesia, this transition has occurred in line with advances in health, education, and access to technology and information (Niquini, 2020) The decline in the birth rate is triggered by several factors, such as increasing women's participation in education and the world of work, as well as increasing awareness of the importance of family planning. Meanwhile, life expectancy is increasing thanks to advances in healthcare, access to medical facilities, and better public health programs (Cole, 2023; de Oliveira, 2021)

This demographic change creates opportunities as well as challenges for Indonesia. On the one hand, the state can take advantage of the demographic bonus, which is a period in which the proportion of the productive age population (15-64 years) is larger than the non-productive age population (children and the elderly) (Alasauskas, 2020) This demographic bonus provides an opportunity for Indonesia to encourage economic growth through increased productivity and competitiveness of the workforce. However, these opportunities can only be optimized if governments are able to provide adequate quality education, skills training, and job creation (Scott, 2020)

On the other hand, Indonesia also faces major challenges in the form of an increase in the number of elderly population ((Lukyanets, 2021; Marois, 2020a) With the increasing number of people entering old age, the need for health services, social security, and elderly care is increasing (Goh, 2020; Qiu, 2020) This challenge requires policies that focus on improving the well-being of older people, including access to affordable health services, adequate pension programs, and better social support (Oosterloo, 2021)

In addition, demographic changes also have an impact on the distribution of the population in Indonesia. Rapid urbanization, especially in major cities such as Jakarta, Surabaya, and Bandung, is putting pressure on infrastructure, the environment, and public services (Marois, 2020b) Migration from villages to cities, driven by the search for better economic opportunities, leads to inequality in development between urban and rural areas (Heer, 2020) This requires serious attention from the government in terms of urban planning, infrastructure development, and more equitable distribution of resources (Guangzhou, 2021; Man, 2021)

Overall, demographic changes in Indonesia require a comprehensive and adaptive policy response. The government needs to anticipate the challenges that arise by developing policies that strengthen the education system, health services, social security, and infrastructure that supports inclusive and sustainable economic growth. With the right approach, demographic change can be a catalyst for stronger and more balanced national development.

3. Method

In the study using data from the Central Statistics Agency (BPS) related to the population dependency ratio, the method used was quantitative (Rogawski, 2018) This method allows for in-depth statistical analysis to understand trends and patterns of demographic change (Sardana et al., 2023)

Quantitative Analysis Methods

Descriptive analysis was used to identify the distribution and average dependency ratio (Ji et al., 2022; Y. Li & Zhang, 2022) Data from BPS is processed to understand changes between

periods and regions, helping to compile an overview. Time series analysis can be used to spot long-term trends in dependency ratios, helping to project future impacts (Sumasto et al., 2022)

Demographic Projections and Deductive Approaches

Demographic projections are important for predicting changes in population structure and their impact on policy. A deductive approach is also relevant, where the hypothesis of the impact of the dependency ratio on HR strategies is tested through quantitative data (Nyawira et al., 2022) The results provide validation of the proposed theory.

Data Visualization and Policy Analysis

Data visualizations such as graphs and thematic maps help clarify the research findings. Policy analysis further correlates quantitative outcomes with practical recommendations, such as workforce planning and social security (Rogawski, 2018)

In conclusion, quantitative methods through statistical analysis, demographic projections, and deductive approaches offer a solid basis for analyzing changes in the dependency ratio and its implications for human resource management in Indonesia (Tashakkori & Newman, 2022) Using data from BPS, a quantitative method with a focus on descriptive and inferential statistical analysis will be the most appropriate approach. This approach provides an objective framework for understanding the changing population dependency ratio in Indonesia and helps to formulate a strong argument for linking demographic data to the implications of human resource management policies.

4. Result and Discussion

The results of the study show the trend of the projected dependence ratio of the Indonesian population, as seen in table 1.

Table 1: Analysis of Projected Population Dependency Ratio in Indonesia (2025-2035)

No	Province Name	Dependency Ratio Population Projection Results		
		2025	2030	2035
1.	Aceh	50,8	47,9	45,8
2.	Sumatera Utara	53,6	51,7	50,8
3.	Sumatera Barat	53,6	51,7	50,6
4.	Riau	48,4	47,1	46,6
5.	Jambi	43,3	42,7	42,7
6.	Sumatera Selatan	47,3	45,8	45,3
7.	Bengkulu	44,9	44,3	44,5
8.	Lampung	47,3	45,6	45,3
9.	Kep. Bangka Belitung	44,3	43,3	43,1
10.	Kep. Riau	41,8	38,1	37,9
11.	Dki Jakarta	42,2	40,1	39,5
12.	Jawa Barat	46,4	46,2	46,6
13.	Jawa Tengah	48,4	49,9	51,7
14.	Di Yogyakarta	46,8	47,7	48,4
15.	Jawa Timur	44,3	46,2	48,4
16.	Banten	43,9	41,8	41
17.	Bali	42,2	43,3	45,8

No	Province Name	Dependency Ratio Population Projection Results		
		2025	2030	2035
18.	Nusa Tenggara Barat	50,2	48,6	48,1
19.	Nusa Tenggara Timur	62,1	61,6	61,6
20.	Kalimantan Barat	48,8	47,3	46,6
21.	Kalimantan Tengah	41,4	40,3	39,9
22.	Kalimantan Selatan	46,2	44,7	44,7
23.	Kalimantan Timur	43,7	43,1	43,5
24.	Sulawesi Utara	46,8	47,3	48,4
25.	Sulawesi Tengah	49,5	48,6	48,6
26.	Sulawesi Selatan	50,4	49,5	49,7
27.	Sulawesi Tenggara	54,6	52,7	51,5
28.	Gorontalo	47,7	47,7	47,9
29.	Sulawesi Barat	52,7	51,5	51,1
30.	Maluku	57,5	55,8	54,3
31.	Maluku Utara	53,4	51,5	50,8
32.	Papua Barat	45,3	44,3	43,7
33.	Papua	42	41,6	42,2
National Average		47,2	46,9	47,3

Data source: Badan Pusat Statistik (<https://www.bps.go.id/id/statistics-table/2/MTIwIzI=/dependency-ratio-hasil-proyeksi-penduduk.html>)

The table shows that the dependency ratio is a demographic indicator that shows the proportion of the unproductive population (children and the elderly) compared to the productive population (working age) (Vicerra, 2020). The projected data on the population dependency ratio in Indonesia for 2025 to 2035 provides valuable insights into the demographic dynamics that occur. The decline in the dependency ratio in many provinces indicates the potential for economic growth, but challenges remain in provinces with high dependency ratios (Huang et al., 2022). Therefore, the right strategy and responsive policies are urgently needed to ensure that all provinces can make optimal use of their demographic potential. The projected dependency ratio data for 38 provinces in Indonesia in 2025, 2030, and 2035 provides an important overview of population dynamics and challenges faced by each region (Skirbekk, 2022).

General Trend of Dependency Ratio

Based on the data obtained, there is a downward trend in the dependency ratio in most provinces. Aceh Province shows a dependency ratio that decreases from 50.8 in 2025 to 45.8 in 2035. This decline reflects an increase in the proportion of the working-age population, which can contribute to regional economic growth (Fu, 2022)

Provinces with the Highest and Lowest Dependency Ratios

Dari data yang ada, Nusa Tenggara Timur (NTT) memiliki rasio ketergantungan tertinggi pada tahun 2025, yaitu 62,1, yang menunjukkan tantangan besar dalam hal dukungan sosial dan ekonomi bagi penduduk usia kerja. Sebaliknya, Kepulauan Riau menunjukkan rasio ketergantungan terendah, yaitu 41,8 pada tahun 2025, yang menunjukkan potensi ekonomi

yang lebih baik karena lebih banyak penduduk yang berada dalam usia produktif (Ditaranto, 2024).

Comparison Between Islands

Comparative analysis between islands in Indonesia shows that the island of Java, especially Central Java, will experience an increase in the dependency ratio from 48.4 in 2025 to 51.7 in 2035. This may be due to the increase in the number of elderly people who are not balanced with the growth of the working-age population. Meanwhile, provinces in Sumatra tend to show a decrease in the dependency ratio, which can be a positive indicator for economic growth in the region (Soboleva, 2020).

Policy Implications

The decline in the dependency ratio in many provinces shows an opportunity to increase economic productivity. However, provinces with high dependency ratios, such as NTT and Maluku, need to receive special attention from the government. Policies that support education, skills training, and job creation should be a priority to reduce dependency and improve the quality of life of the population (Prince, 2015).

The results of this study show that the projected population dependency ratio in Indonesia between 2025 and 2035 varies significantly in each province, with the national average reflecting the demographic challenges that need to be faced. Some provinces, such as East Nusa Tenggara and Maluku, show high dependency ratios, which may indicate a greater burden on the productive population to support non-productive groups. This requires special attention in social and economic policy planning, as well as the development of more adaptive human resource management strategies (Herachwati et al., 2023).

In addition, these findings underscore the importance of developing training and upskilling programs for the workforce, especially in areas with high dependency ratios, to ensure that productive populations can contribute optimally to economic growth. The study also emphasizes the need for collaboration between the government, the private sector, and the community to create an environment that supports the growth of a quality workforce, so as to reduce the negative impact of a high dependency ratio (Madu et al., 2023).

Overall, the results of this study provide a strong basis for better decision-making in formulating policies and strategies that are responsive to demographic changes, as well as encouraging sustainable human resource development in Indonesia.

5. Conclusions

The conclusion of this study is that a deep understanding of the projected population dependency ratio in Indonesia between 2025 and 2035 is essential to formulate effective human resource management policies and strategies, in order to face demographic challenges and improve national economic competitiveness.

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