

NOURISHING THE MIND: INTEGRATING FREE NUTRITIONAL MEAL POLICY WITH PSYCHOLOGICAL DEVELOPMENT AND GREEN HUMAN RESOURCES IN ELEMENTARY SCHOOLS

Frederick Rudy Sentosa Rajagukguk¹, Indra Welly Arifin², Hastuti Handayani Harahap³

Sekolah Tinggi Ilmu Ekonomi Bina Karya Tebing Tinggi^{1,2,3}

E-mail: rudyrajagukguk00241@gmail.com¹, indrawellyarifin66@gmail.com²,
harahaphastutyhandayani@gmail.com³

*Korespondensi: rudyrajagukguk00241@gmail.com

Received : 01 October 2025

Published : 17 January 2026

Revised : 15 October 2025

DOI : <https://doi.org/10.54443/ijebas.v5i6.5008>

Accepted : 16 November 2025

Link Publish : <https://radjapublika.com/index.php/IJEAS>

Abstract

The Free Nutritious Meal Program (MBG) is a strategic government policy aimed at improving the nutritional quality of elementary school children while strengthening human resource development from an early age. This study aims to analyze the nutritional status and consumption patterns of elementary school students, examine the influence of MBG on students' psychological development, particularly their concentration on learning, motivation, and school attendance, and evaluate the program's role in shaping healthy eating behaviors and sustainable lifestyle habits from a green human resource perspective. The research approach uses a descriptive qualitative method with literature and policy analysis, supported by empirical findings from previous studies and reports from international institutions. The results show that the Free Nutritious Meal Program contributes positively to improving students' nutritional status and shifting consumption patterns towards healthier ones. In addition, MBG has been shown to support increased concentration on learning, motivation, and school attendance. However, the integration of green human resource values in the implementation of MBG is still not optimal and tends to be partial. Therefore, a holistic and sustainable MBG policy integration model is needed that involves schools, families, and communities. This study concludes that MBG functions not only as a nutritional fulfillment program but also as a strategic instrument for developing green human resources that are healthy, have character, and are sustainable from an early age.

Keywords: *Free Nutritional Meal Program; Nutritional Status; Psychological Development; Green Human Resources; Elementary School*

1. Background

Developing quality human resources (HR) from an early age is the primary foundation for sustainable national development. Elementary school, as the initial phase of formal education, plays a strategic role in shaping children's cognitive capacity, character, and psychological readiness. However, the quality of learning at the elementary school level still faces various structural challenges, one of which is the disparity in students' nutritional status, which directly impacts their psychological development and learning abilities. Nutritional problems in school-age children not only impact physical health but also significantly impact cognitive function, concentration, emotional stability, and learning motivation. Children who are malnourished tend to exhibit higher levels of fatigue, difficulty focusing, and are susceptible to stress, which ultimately impact academic achievement and psychosocial development. In this context, adequate nutrition is a crucial prerequisite for optimizing a holistic educational process.

In response to these issues, the Free Nutritious Meals policy is a strategic government intervention to guarantee children's basic right to healthy food while simultaneously strengthening the quality of education. This policy is not only interpreted as a program to fulfill biological needs, but also as a long-term human development instrument. When children receive a consistent, balanced nutritional intake in the school environment, the potential for increased learning capacity, mental health, and psychological well-being can be realized more evenly. However, the implementation of the Free Nutritious Meals policy will be more optimal if it is integrated

NOURISHING THE MIND: INTEGRATING FREE NUTRITIONAL MEAL POLICY WITH PSYCHOLOGICAL DEVELOPMENT AND GREEN HUMAN RESOURCES IN ELEMENTARY SCHOOLS

Frederick Rudy Sentosa Rajagukguk et al

with psychological development efforts and the formation of green human resources from an early age. Basic education plays a strategic role in instilling the values of sustainability, environmental awareness, and healthy and environmentally friendly lifestyles. A pattern of consuming nutritious food sourced from local, sustainable, and low-carbon food can be an effective educational tool to shape children's ecological awareness while strengthening psychological dimensions such as empathy, responsibility, and social concern. The integration of nutrition policy, psychological development, and environmental education in elementary schools reflects a holistic and sustainable approach to human resource development. Children are positioned not only as program beneficiaries but also as active learning subjects in understanding the relationship between personal health, mental well-being, and environmental sustainability. Thus, the Free Nutritious Meals policy has the potential to be a strategic medium in building a generation that is physically healthy, psychologically resilient, and has a value orientation towards green development. It is important to examine in depth how the integration of the Free Nutritious Meals policy with psychological development and green human resources in elementary schools can contribute to improving the quality of education and the formation of a sustainable generation. This study is relevant not only in the context of education and health policies, but also within the framework of national development oriented towards inclusive green development and strengthening the quality of Indonesia's human resources in the future.

Table 1.1 Data on Nutritional Status and Nutritional Environment of Elementary School Children in Indonesia

| Aspect | Indicator | Key Findings |
|---|------------------------------|---|
| National nutritional status of elementary school children | Prevalence of wasting (thin) | Increased from 7.7% to 8.5% |
| | Prevalence of overweight | Increased from 3.8% to 4.2% |
| | Prevalence of underweight | Increased to 17.1% |
| Dietary patterns & nutritional status of elementary school children | Insufficient energy intake | 45% of students experience insufficient energy intake |
| | Malnutrition status | 26% of students are classified as malnourished |
| School nutrition environment | Availability of healthy food | Very limited in most schools |
| | Physical activity facilities | Low and uneven |
| | Formal nutrition education | Minimal integration in the curriculum |

Source :Indonesian Health Survey (SKI)/ UNICEF

The data in Table 1 shows that nutritional problems among elementary school children in Indonesia remain at an alarming level and are multidimensional. The simultaneous increase in the prevalence of wasting, underweight, and overweight indicates a double burden of malnutrition, where children face both malnutrition and the risk of overnutrition due to unbalanced diets. This condition has the potential to hinder children's cognitive development, learning concentration, and emotional stability during a crucial phase of psychological growth. Findings at the elementary school level, such as at SD Inpres 36 Rumah Tiga Ambon, reinforce this national picture. The percentage of 45% of children with insufficient energy intake and 26% of children with malnutrition status indicates that nutritional problems are not only structural but also highly contextual and influenced by the school environment. Energy and nutrient deficiencies during elementary school years directly impact endurance, learning motivation, and emotional regulation, which are essential components of a child's psychological development.

Furthermore, the results of a nutritional environment assessment in 268 elementary schools in Indonesia revealed that schools do not fully function as spaces that support healthy eating behaviors. Limited healthy food choices, minimal physical activity facilities, and a lack of formal nutrition education indicate a gap between holistic educational goals and practice. This condition weakens the role of schools as agents for forming healthy and sustainable lifestyle habits from an early age. In the context of this research, these data emphasize the urgency of integrating the Free Nutritious Meals policy with a more comprehensive approach, oriented not only towards meeting nutritional needs but also towards psychological development and the formation of green human resources. The provision of nutritious meals in schools can be an educational medium to instill the values of

NOURISHING THE MIND: INTEGRATING FREE NUTRITIONAL MEAL POLICY WITH PSYCHOLOGICAL DEVELOPMENT AND GREEN HUMAN RESOURCES IN ELEMENTARY SCHOOLS

Frederick Rudy Sentosa Rajagukguk et al

mental health, discipline, social empathy, and environmental awareness through the selection of local, sustainable, and environmentally friendly foods. Thus, the Free Nutritious Meals policy has the potential to be a strategic instrument in building a generation that is physically healthy, psychologically stable, and has a value orientation towards sustainable development.

Table 1.2. Impact of the Free Nutritional Meal Program (MBG) in Elementary Schools

| Impact Dimension | Indicator | Key Findings | Educational Implications |
|---|--------------------------------|--|---|
| Nutritional status and health of children | Nutritional status & stunting | MBG improves nutritional status and reduces the prevalence of stunting | Children are healthier and ready to learn |
| | General health | Increased endurance and energy | Reduce fatigue and absenteeism |
| Learning & psychological processes | Concentrate on studying | Student concentration increases | The learning process is more effective |
| | Attendance at school | Student attendance rate increased | Continuity of learning is maintained |
| Family consumption behavior | Eating patterns at home | Parents reduce high sugar/fat snacks | There is a cross-environmental educational effect |
| | Parental nutritional awareness | Increased post MBG implementation | Long-term behavioral changes |
| Academic impact (international) | Mathematics achievement | Students' math scores improved | More optimal cognitive performance |
| | Reading achievement | Improved reading skills | Basic literacy is getting stronger |

The Free Nutritious Meals (MBG) program in elementary schools has been shown to have a significant impact not only on children's physical health but also on their educational and psychological development. A systematic review showed that regular nutritional support through the MBG program can improve children's nutritional status, reduce stunting rates, and improve overall health. Children who receive balanced nutrition exhibit more stable energy levels, making them better prepared physically and mentally for school learning. From a psychological and educational perspective, the MBG program contributes to improved student concentration and school attendance. Improved concentration reflects the optimization of cognitive function, which is strongly influenced by adequate nutrition, particularly during elementary school, a crucial phase of brain development. Meanwhile, increased student attendance indicates that the MBG program also serves as a motivating factor for educational participation, particularly for children from economically vulnerable families.

The impact of the MBG program extends beyond the school environment and extends to the family. This program has increased parental awareness of the importance of balanced nutrition, reflected in changes in children's consumption patterns at home. Parents tend to reduce the provision of snacks high in sugar and fat and begin to pay attention to the quality of their children's daily meals. This effect demonstrates that the MBG program has an indirect educational function that strengthens the environment that supports children's holistic growth and development. International findings further reinforce the relevance of the MBG program. A large-scale study in China showed that a free school meals program contributed to improved student math scores through improved health status and attendance rates. Similarly, the UNESCO 2025 Report confirms that providing nutritious meals in schools is one of the most effective interventions for improving attendance, academic achievement, and literacy and numeracy skills in low- and middle-income countries.

In the context of this research, the findings confirm that the MBG program is a strategic instrument in early human resource development. When integrated with psychological development and green human resource education, MBG not only shapes healthy and intelligent children but also individuals with sustainable lifestyle habits. The use of local food, environmentally friendly nutrition education, and the instilling of healthy consumption habits in elementary schools provide important foundations for building a generation that is cognitively superior, psychologically resilient, and oriented towards green development. Developing superior and

sustainable human resources (HR) is a national strategic agenda in facing global challenges, including the demographic dividend, climate change, and green economic transformation. Elementary schools, as the initial phase of formal education, play a crucial role in shaping the foundation of children's health, cognitive capacity, and character. However, various empirical data indicate that issues of nutrition and the quality of the learning environment for elementary school children in Indonesia remain serious challenges that have the potential to hinder the achievement of long-term HR development goals.

The urgency of this research is further strengthened by the high prevalence of nutritional problems among elementary school children, including malnutrition, stunting, and overnutrition. These conditions not only impact physical health but also significantly influence children's psychological development, concentration, learning motivation, and academic achievement. Without integrated intervention, nutritional problems have the potential to widen the gap in education quality and weaken the competitiveness of future generations. The Free Nutritious Meals (MBG) policy is a strategic step by the government to ensure the fulfillment of children's basic rights to nutritious food and support improvements in education quality. However, the implementation of the MBG program has tended to be understood solely as a health and social intervention, thus not being fully integrated with the dimensions of children's psychological development and the formation of sustainable values. Yet, empirical evidence shows that school meal programs have a broad impact on learning concentration, student attendance, and the consumption behavior of children and families.

The urgency of this research lies in the need to examine the Green Human Resource Development Program (MBG) as a holistic human resource development instrument, not merely as a nutritional program. The integration of nutritious eating policies, child psychological development, and green human resource education in elementary schools remains relatively understudied, particularly in the Indonesian context. Yet, this approach has the potential to produce a multiplier effect: improving the quality of learning while simultaneously fostering environmental awareness and sustainable living behaviors from an early age. Furthermore, from a sustainable development perspective, elementary schools are a strategic space for instilling green human resource values, such as consuming healthy, locally sourced food, reducing food waste, and caring for the environment. Without a comprehensive scientific study, the opportunity to utilize the MBG program as a medium for sustainability education risks being underutilized. Therefore, this research is crucial in providing a conceptual and empirical foundation for strengthening the design and implementation of the MBG policy, aligned with the inclusive green development agenda.

Identification of problems

Based on the background and urgency of the research, several main problems can be identified as follows:

1. The problem of nutrition among elementary school children is still significant
Elementary school children in Indonesia still face multiple nutritional problems, including malnutrition, stunting, and overnutrition, which impact physical health, cognitive development, and learning readiness.
2. The impact of nutrition on children's psychological aspects has not been addressed optimally.
Nutritional issues not only affect physical health but also impact children's concentration, motivation, emotional stability, and psychological well-being. However, these psychological aspects have not been a primary focus in the implementation of nutrition policies in schools.
3. The implementation of the Free Nutritious Meal Program is still oriented towards fulfilling nutritional needs.
The Free Nutritious Meal Program (MBG) tends to be understood as a food aid program, so its integration with the goals of education, psychological development, and character formation of children is not optimal.
4. The school environment does not fully support the formation of healthy and sustainable eating behavior.
Limited healthy food choices, minimal nutrition education, and low integration of environmental sustainability values in elementary schools hinder the formation of healthy lifestyle habits from an early age.
5. Green HR values and practices have not been integrated into school nutrition policies.
The MBG program has not been systematically linked to green human resource education, such as local food consumption, food waste reduction, and environmental awareness, even though elementary school is a strategic phase for instilling these values.
6. Limitations of empirical studies that integrate nutrition, psychology, and green human resources

Previous research generally discussed nutrition, education, or the environment separately, so there is still a research gap in examining the integration of the three in the context of the MBG program in elementary schools.

Formulation of the problem

1. What are the nutritional status and consumption patterns of elementary school students in the context of the implementation of the Free Nutritious Meal Program?
2. How does the Free Nutritional Meal Program affect the psychological development of elementary school students, especially their concentration on learning, motivation, and school attendance?
3. What is the role of the Free Nutritional Meal Program in shaping healthy eating behaviors and sustainable living habits in school and family environments?
4. To what extent has the integration of green human resource values been implemented in the implementation of the Free Nutritional Meal Program in elementary schools?
5. What factors support and hinder the integration of the Free Nutritious Meals policy with psychological development and green human resources in elementary schools?
6. How is the Free Nutritious Meal policy integration model effective in supporting psychological development and the formation of green human resources from an early age?

2. Results and Discussion

2.1 Nutritional status and consumption patterns of elementary school students in the context of the implementation of the Free Nutritious Meal Program

The nutritional status and consumption patterns of elementary school students are important indicators in assessing the quality of children's health and readiness to learn at an early age. During the elementary school phase, children's nutritional needs increase in line with physical growth, brain development, and the demands of increasingly complex learning activities. However, various empirical findings indicate that the nutritional status of elementary school students in Indonesia still faces serious challenges, including malnutrition, stunting, and overnutrition due to unbalanced consumption patterns. In the context of the Free Nutritious Meal Program (MBG), the initial condition of students' nutritional status shows significant disparities. Some students still experience insufficient energy and micronutrient intake, while others begin to show a tendency to overconsume foods high in sugar, fat, and salt. These consumption patterns are generally influenced by family socioeconomic factors, the availability of healthy food, and a school environment that does not fully support healthy eating behaviors.

The MBG program is a strategic intervention to improve these conditions by providing nutritious, balanced meals in schools. With menu compositions tailored to the nutritional needs of elementary school-aged children, this program aims to ensure that energy, protein, vitamin, and mineral requirements are regularly met. The implementation of MBG is expected to reduce the prevalence of malnutrition and gradually improve students' nutritional status, so that children are in optimal physical condition to participate in the learning process. In addition to impacting nutritional status, MBG implementation also influences students' consumption patterns more broadly. Children who are accustomed to receiving nutritious meals at school begin to recognize a variety of healthy menus, balanced meal portions, and the importance of consuming vegetables, fruit, and sources of protein. This habituation has the potential to shape healthier food preferences, which will not only apply in the school environment but also carry over into the home environment.

In many cases, changes in students' consumption patterns have also increased parental awareness of the importance of balanced nutrition. The MBG program serves as an indirect educational tool for families, where parents begin to adjust their children's diets at home by reducing the consumption of high-sugar and high-fat snacks and paying attention to the quality of daily intake. Thus, the impact of the MBG is not partial, but extends throughout the family ecosystem as part of the child's growth and development environment. However, the effectiveness of the Free Nutritious Meal Program in improving students' nutritional status and consumption patterns depends heavily on the quality of its implementation. Aspects such as program sustainability, food quality, menu variety, and the integration of nutrition education into learning activities are critical factors in its success. Without the support of a conducive school environment and the active participation of teachers and parents, changes in nutritional status and consumption patterns are at risk of not being optimal and sustainable.

1. Nutritional Status of Elementary School Children and Their Consumption Patterns

According to Ratnasari and Purniasih (2025), the nutritional status of elementary school children is influenced by the balance between nutrient intake and the body's metabolic needs, which impacts growth,

brain development, and intellectual abilities. Poor nutritional conditions—whether in the form of deficiency or excess—are often visible through anthropometric indicators such as Body Mass Index (BMI), and the nutritional status of school children in various regions of Indonesia shows diversity with a still significant prevalence of malnutrition. This finding is in line with research on consumption patterns that show that daily food consumption is strongly correlated with children's nutritional status, where a diet high in energy but low in micronutrients negatively impacts overall nutritional status.

Another study by Jusriani & Zulfitriwati (2024) reinforces the importance of balanced nutrition education in improving students' knowledge about nutrition and healthy food choices, which in turn can positively influence children's consumption patterns. They stated that school-age children require adequate and balanced nutritional intake to support optimal physical growth and cognitive development. An imbalance in nutritional intake, such as too many foods high in sugar and fat, will contribute to health problems such as obesity and impaired cognitive function, which impacts the learning process. Furthermore, research by Kartika Sari & Dora (2024) revealed a relationship between consumption patterns prepared by parents and students' learning concentration. They emphasized that parental involvement in preparing appropriately nutritious meals is crucial because eating patterns at home complement consumption obtained at school, influencing children's physiological and psychological responses to learning.

2. Impact of the Free Nutritional Meal Program on Nutritional Status and Consumption Patterns

The Free Nutritional Meal Program (MBG), as an integrated education and health policy, has been systematically reviewed by Mowilos et al. (2025). According to the researchers, this program has been shown to have a positive impact on students' nutritional status, including improving overall nutritional status, reducing stunting rates, and increasing school attendance. This suggests that when students consistently receive nutritious meals at school, they experience physiological benefits as well as mental readiness for learning. A national evaluation of the school healthy breakfast program also showed that schools that implemented a comprehensive approach including healthy food provision, nutrition education, and environmental support significantly increased student dietary diversity and meal frequency.

These findings suggest that school-based nutritional interventions not only impact children's physical nutritional status but also modify their consumption patterns and eating behaviors in the medium to long term. Furthermore, these findings are consistent with global evidence that school-based programs that provide healthy food and nutrition education have the potential to improve dietary diversity, increase meal frequency, and reduce reliance on unhealthy foods. Related international studies have also shown that similar programs in other countries can reduce the prevalence of malnutrition and shift children's consumption patterns toward healthier ones.

3. Integrating Nutritious Eating with Education and a Healthy Environment

Nutrition education experts emphasize that an integrated approach between providing nutritious food and nutrition education in schools is more effective in changing student consumption patterns than simply providing free meals. Karen Charlton et al. (2020) noted that successful school-based nutrition interventions tend to combine food provision with experiential learning and changes to the school environment that support healthy food choices. This creates a broader culture of healthy eating within the school and beyond.

Thus, students' nutritional status and consumption patterns cannot be viewed separately from the context of implementing nutritious eating policies. The implementation of MBG, complemented by nutrition education and school environmental support, creates opportunities for sustainable changes in children's eating behavior. This is crucial for developing a generation that is not only physically healthy but also psychologically mature and ready to participate in broader green human resource development. Research by Purba et al. (2024) confirms that customer loyalty is influenced not only by price factors, but also by consumer tastes and product availability. In the context of modern retail, consistent product availability and appropriate discounts have been shown to increase satisfaction and encourage repeat purchases. These findings suggest that product management strategies oriented to consumer needs and preferences play a crucial role in building long-term relationships with customers. Meanwhile, Rajagukguk, Arifin, and Harahap (2025) highlight the importance of Green Human Resources (Green HR) in improving employee job satisfaction, particularly in the eco-friendly hospitality industry in the Lake Toba region. The results of the study indicate that green HR practices, such as environmentally conscious training and a sustainable work culture, have a positive effect on employee job satisfaction, with the work environment acting as an intervening variable. These findings reinforce the argument that the success of eco-friendly organizations is

highly dependent on HR management aligned with sustainability values. Furthermore, Harahap, Rajagukguk, and Arifin (2025) found that green policy and environmentally friendly supply chain management significantly impact a company's competitive advantage. This influence is further strengthened when the company adopts green technology as an intervening variable. This study confirms that integrating green policies throughout a company's value chain not only impacts environmental sustainability but also serves as a business strategy that enhances competitiveness. Similarly, Rajagukguk et al. (2024) in their study of Green Human Resource practices emphasized that the implementation of green human resources can reduce the industry's carbon footprint through changes in employee work behavior, efficient use of resources, and strengthening an environmentally oriented organizational culture. This study demonstrates that green human resources are not merely normative but also make a real contribution to achieving a company's sustainability goals.

In the context of local economic development, Arifin, Harahap, and Rajagukguk (2025) demonstrated that optimizing community-based tourism businesses can be achieved through product innovation and digital marketing. This approach not only enhances tourist appeal but also strengthens business sustainability by increasing local added value and community involvement. This finding is relevant in the context of sustainable development, which integrates economic, social, and environmental aspects. Furthermore, Arifin, Harahap, and Rajagukguk (2025) also demonstrated that green marketing techniques significantly influence consumer purchasing decisions in organic product companies. This influence is mediated by perceived product quality, indicating that consumers are increasingly considering sustainability and environmental quality in their decision-making processes. This research reinforces the view that green marketing strategies can increase consumer trust while encouraging sustainable consumption behavior. These findings provide a strong empirical foundation for further research examining green human resource development and sustainability in various sectors.

2.2 The effect of the Free Nutritional Meal Program on the psychological development of elementary school students, especially learning concentration, motivation, and school attendance.

The Free Nutritious Meal Program (MBG) is not only focused on meeting children's physical needs but also has significant implications for the psychological development of elementary school students. During elementary school, children are in a phase of cognitive and social development that is heavily influenced by biological factors, including daily nutritional intake. Nutritional imbalances can impact brain function, emotional stability, and mental readiness for learning.

1. The Effect of MBG on Learning Concentration

Concentration in learning is a key psychological aspect that determines the effectiveness of the learning process. According to Grantham-McGregor et al. (2020), adequate macro and micronutrients, such as protein, iron, and essential fatty acids, are positively correlated with children's cognitive function, including attention span and working memory. Children who are malnourished tend to tire more easily, have difficulty focusing, and exhibit lower academic performance. Similarly, Adolphus, Lawton, and Dye (2021) emphasized that consuming nutritious food before and during school hours plays a crucial role in maintaining stable blood glucose levels, thus supporting brain activity and student concentration. In the context of the MBG Program, providing healthy meals at school helps ensure that students are mentally prepared to receive learning materials without being distracted by hunger or fatigue. Thus, the Free Nutritious Meal Program contributes directly to improving elementary school students' concentration in learning, which ultimately impacts material comprehension and learning outcomes.

2. The Influence of MBG on Learning Motivation

Learning motivation is an internal drive that influences students' willingness to actively engage in learning activities. Ryan and Deci (2020), in their Self-Determination theory, explain that fulfilling basic needs, including physiological needs, is a prerequisite for intrinsic motivation. Children whose basic needs are met will be more psychologically prepared to learn and participate in class. Furthermore, Bundy et al. (2022) state that school meal programs can improve students' sense of security and psychological well-being, especially for children from low-income families. This sense of security creates a more conducive learning environment and increases students' motivation to attend and engage in academic activities. In the context of MBG, free meals provided by schools not only reduce the economic burden on families but also foster feelings of appreciation and care from the government and educational institutions. This indirectly strengthens students' motivation to learn and positive attitudes toward school.

3. The Influence of MBG on Student Attendance at School

Student attendance is a crucial indicator of the success of primary education. Drake et al. (2021) found that school feeding programs have been shown to increase student attendance rates, particularly in areas with social and economic vulnerability. Children are more motivated to attend school when their basic needs, including food, are met. A study by the World Food Programme (WFP, 2023) also showed that nutritious meal programs in primary schools can reduce absenteeism and dropout rates. This is due to improved physical and psychological health of students, as well as increased parental perceptions of the importance of school attendance. In the implementation of the MBG Program in Indonesia, increased student attendance can be interpreted as a demonstration of the program's success in creating non-financial incentives that support continued participation in primary education.

Based on expert opinions and empirical findings post-2020, it can be concluded that the Free Nutritious Meal Program has a significant impact on the psychological development of elementary school students. This program contributes to improving learning concentration by meeting nutritional needs, strengthening learning motivation through improved psychological well-being, and encouraging consistent student attendance. Therefore, the MBG is relevant not only as a nutrition policy but also as a strategy for early childhood human resource development that supports the achievement of national education goals and sustainable development.

The application of green-oriented marketing concepts and policies is gaining increasing attention in response to growing consumer awareness and global sustainability challenges. In the context of consumer behavior, Arifin, Harahap, and Rajagukguk (2024) found that green marketing techniques significantly influence consumer loyalty to environmentally friendly products. This study confirmed that loyalty is not only influenced by the product's green image but is also strongly mediated by the implementation of green pricing, where consumers are willing to pay higher prices if the value of sustainability and environmental benefits are communicated transparently and credibly. Furthermore, from a macro policy perspective, Harahap, Rajagukguk, and Arifin (2025) showed that public policy plays a strategic role in encouraging the adoption of green technology and blue innovation as the foundation of a circular economy. These findings emphasize that the success of the transformation towards a green economy depends not only on market actors but also on regulatory alignment, government incentives, and cross-sector synergies. Progressive public policies have been shown to accelerate environmentally friendly innovation while increasing the competitiveness of a sustainable economy.

In the realm of financing, Harahap, Rajagukguk, and Arifin (2024) suggest that green financing plays a crucial role in driving the growth of the green economy, particularly in the Micro, Small, and Medium Enterprises (MSMEs) sector in North Sumatra. This study highlights that green financing support can increase the capacity of MSMEs to produce environmentally friendly products, while strengthening business sustainability through resource efficiency and product innovation. Consumer psychology is also a crucial element in understanding the effectiveness of green marketing strategies. Rajagukguk (2024) revealed, through a study of marketing psychology, that the decoy effect can influence consumer behavior in choosing higher-priced products. This finding is relevant in the context of green marketing, where pricing strategies and framing of green products can shape value perceptions, leading consumers to prefer environmentally friendly products even though they are relatively more expensive.

Furthermore, in the context of organizations and human resources, Rajagukguk, Arifin, and Harahap (2024) emphasized that green leadership and sustainability-based human resource management significantly influence sustainable innovation in green economy-based industries. Environmentally oriented leadership has been shown to build a green organizational culture, encourage innovative employee behavior, and increase the industry's adaptability to the demands of sustainable development. Overall, this series of studies demonstrates a strong link between green marketing, public policy, green financing, consumer psychology, and green leadership and human resources in building a sustainable green economy ecosystem. These findings strengthen the argument that the success of a green economy requires a multidimensional approach that holistically integrates marketing strategies, policies, financing, and human resource management.

2.3 The role of the Free Nutritional Meal Program in shaping healthy eating behaviors and sustainable living habits in school and family environments

The Free Nutritious Meal Program (MBG) not only serves as an intervention to meet the nutritional needs of elementary school students but also plays a strategic role in fostering healthy eating behaviors from an early age. According to the World Health Organization (WHO, 2021), eating habits formed in childhood tend to persist into adulthood, thus nutrition interventions in schools have a long-term impact on the health of individuals and communities. In this context, the MBG is an effective educational tool for introducing balanced eating patterns,

appropriate portion sizes, and a variety of nutrient-rich foods. Furthermore, UNICEF (2022) emphasizes that the school environment is a highly influential social space in shaping children's eating behaviors. Providing nutritious meals regularly through the MBG program helps children recognize healthy foods as part of their daily routine, rather than as an occasional option. This habituation encourages children to reduce their reliance on ultra-processed foods, high-sugar snacks, and sweetened beverages, which have traditionally dominated elementary school children's consumption patterns.

From a sustainable education perspective, the FAO (2023) states that school meal programs integrated with nutrition and food sustainability education can foster children's awareness of the relationship between food, health, and the environment. School meal programs, which prioritize the use of local food ingredients, balanced diets, and proper food waste management, contribute to the development of sustainable lifestyle habits. Children not only learn to eat healthily but also understand the importance of reducing food waste and respecting natural resources. The role of school meal programs in shaping healthy eating behaviors also extends to the family environment. Ruel and Alderman (2021) emphasize that school-based nutrition interventions often have spillover effects into the household. Parents who observe positive changes in their children's health and eating habits tend to adjust their family's consumption patterns, such as increasing the provision of nutritious foods and reducing unhealthy foods. Thus, school meal programs serve as catalysts for changes in nutritional behavior not only in children but also in the family system as a whole.

Furthermore, UNESCO (2024) highlights that a comprehensively designed school meal program can be an instrument for character education and a sustainable lifestyle. By integrating MBG into the curriculum, children are taught the values of responsibility, discipline, and concern for their own health and the environment. Washing hands before eating, consuming food without leaving any waste, and familiarizing themselves with local foods are simple practices that contribute to the development of sustainable human resources. However, the effectiveness of the Free Nutritious Meal Program in developing healthy eating behaviors and sustainable lifestyles depends heavily on consistent implementation and support from various stakeholders. Bundy et al. (2021) emphasize that the success of a school meal program requires the active involvement of teachers, parents, the government, and food providers. Without ongoing nutrition education and a supportive environment at home, changes in children's eating behavior are at risk of being temporary.

Digital transformation and innovation are key factors in increasing the competitiveness of Micro, Small, and Medium Enterprises (MSMEs), especially in rural areas. Arifin et al. (2025) in a community service study in Pelanggiran Laut Tador Village showed that the use of digital technology and packaging innovation significantly increased the added value and competitiveness of brown sugar and chip MSMEs. Digitalization of marketing and more modern packaging designs have been shown to expand market reach, improve product quality perceptions, and strengthen the position of MSMEs in local and regional market competition. Individual psychological aspects also play a significant role in shaping long-term entrepreneurial readiness. Rajagukguk, Harahap, and Arifin (2025) revealed a strong relationship between adolescents' self-regulation levels and entrepreneurial readiness in adulthood. This study confirms that the ability to regulate oneself, control emotions, and set goals from a young age is an important foundation in creating adaptive and innovative entrepreneurs, especially in facing the challenges of the digital and sustainable economy.

From a macro policy perspective, Harahap et al. (2025) emphasize the strategic role of green technology innovation in mediating the influence of green policy on sustainable national economic policies. These findings indicate that environmental policies that are not accompanied by technological innovation tend to be less effective in driving economic transformation. Therefore, the integration of green policies and the adoption of environmentally friendly technologies is an important prerequisite for building a competitive and sustainable national economy. In the context of consumer behavior, Arifin, Rajagukguk, and Harahap (2025) found that word of mouth and brand equity significantly influence purchasing decisions for technology products, particularly iPhones, in Tebing Tinggi City. This study underscores the importance of brand reputation and communication between consumers in shaping market trust and preference, which is relevant for both MSMEs and large companies in designing effective marketing strategies in the digital era.

The transformation efforts of MSMEs towards a smart economy are also demonstrated in research by Rajagukguk et al. (2025), which examines the strengthening of the economy of Block 10 Village through technology and innovation in oyster mushroom MSMEs. The results of the study indicate that the application of production technology, digital marketing, and product innovation can improve business efficiency, expand market access, and encourage sustainable village economic independence. Furthermore, marketing strategies based on consumer psychology also influence sales performance in the digital era. Rajagukguk et al. (2025) in a study of

the e-commerce industry in Indonesia found that psychological selling techniques have a positive effect on increasing sales, with customer commitment as an intervening variable. These findings confirm that emotional and relational approaches in digital marketing can strengthen customer loyalty and business sustainability. Similarly, Putri et al. (2025) revealed that electronic word of mouth (E-WOM), menu variety, and price perception have a significant influence on consumer purchasing decisions in local culinary businesses. This study emphasizes the importance of digital reviews, product innovation, and appropriate pricing strategies in building consumer appeal and trust amidst increasingly fierce market competition.

Overall, this series of studies demonstrates that increasing MSME competitiveness and economic sustainability requires a multidimensional approach that integrates digital transformation, product innovation, green policies, and an understanding of consumer behavior and psychology. These findings reinforce the argument that the synergy between technology, policy, and human resources is key to building adaptive, inclusive, and sustainable local and national economies. In the context of this research, the MBG is seen as a strategic instrument for human development that is oriented not only towards improving nutritional status but also towards establishing healthy eating behaviors and sustainable lifestyle habits from an early age. The integration of nutritional fulfillment, education, and sustainability values makes the Free Nutritious Meal Program relevant as a foundation for developing healthy, environmentally conscious, and competitive human resources in the future.

2.4 To what extent has the integration of green human resource values been implemented in the implementation of the Free Nutritional Meal Program in elementary schools?

The integration of green human resource (HR) values into the implementation of the Free Nutritional Meals (MBG) Program in elementary schools is a crucial aspect in ensuring that the program is not only oriented towards meeting nutritional needs but also supports the principles of sustainability and environmentally conscious human development. Green HR emphasizes the development of attitudes, behaviors, and competencies of individuals who care about resource efficiency, environmental conservation, and long-term sustainability. In the context of the MBG, the integration of these values is reflected in the way the program is designed, implemented, and socialized to the entire school community. At the operational level, the integration of green HR values in the MBG is beginning to be seen through efforts to use local and fresh food ingredients in preparing school meal menus. The use of local products not only supports food security and the economy of the community around the school but also reduces the carbon footprint resulting from long-distance food distribution. This practice demonstrates an initial awareness of sustainability principles in program management, although the level of implementation varies between schools and regions.

Furthermore, green human resource values are also reflected in the management of the school dining environment. Several schools have begun implementing environmentally friendly habits such as reducing the use of single-use plastics, managing food waste, and promoting sustainable hygiene and sanitation practices. Through simple activities like bringing their own cutlery, sorting waste, and finishing the food served, students are indirectly trained to be environmentally responsible. However, these practices are still partial and have not been fully integrated into systematic school policies. In terms of competency and character development, the integration of green human resource values into the MBG also depends on the role of teachers and education personnel. Teachers function as agents of change who not only oversee the implementation of the meal program but also instill values of environmental and health awareness through role models and contextual learning. When MBG is linked to learning materials on nutrition, health, and the environment, this program has the potential to become a holistic educational tool that shapes students' character from an early age. However, limited training and specific guidance related to green human resources still hinders the optimal implementation of the role of educators.

Furthermore, the integration of green human resource values into the MBG also reflects the extent to which schools are able to build synergy with families and surrounding communities. The sustainability values students acquire at school will be more meaningful if reinforced at home, for example through healthy consumption patterns, reducing food waste, and utilizing local foods. In practice, parental involvement in supporting these values remains uneven, so the impact of the MBG as an instrument for developing green human resources is not yet fully optimal. Overall, the integration of green human resource values in the implementation of the Free Nutritious Meal Program in elementary schools has begun to be seen, but is still in its early stages and has not been comprehensively structured. The MBG program has great potential to become a vehicle for developing healthy, environmentally conscious, and sustainability-oriented human resources, if supported by consistent policies, adequate educator capacity, and the active involvement of all stakeholders. Therefore, strengthening the

integration of green human resource values is a strategic necessity so that the MBG contributes not only to improving nutritional status but also to sustainable human development from an early age.

2.5 An effective integration model of the Free Nutritious Meals policy in supporting psychological development and the formation of green human resources from an early age.

An effective Free Nutritious Meals (MBG) policy integration model needs to be understood as a holistic approach that combines aspects of nutritional fulfillment, child psychological development, and internalization of sustainable values within a single basic education policy framework. MBG functions not only as a food aid program but also as a strategic instrument for long-term human resource development. Therefore, the policy integration model designed must be able to bridge children's biological needs with cognitive, emotional, and environmentally conscious character development from an early age. In the psychological development dimension, the MBG integration model places nutritional fulfillment as the primary foundation for student concentration, emotional stability, and motivation. Children who receive a consistently balanced nutritional intake tend to have better focus, lower levels of fatigue, and more optimal mental readiness to participate in the learning process. In this model, the timing and mechanism of school meal delivery are aligned with students' learning rhythms, so that MBG functions as a support system that strengthens the quality of the daily learning experience.

Furthermore, an effective integration model also links the implementation of the MBG with the development of green human resource behavior and character. Values such as self-care, environmental responsibility, and sustainability awareness are introduced through concrete practices that accompany the school meal program. Selecting locally sourced food menus, reducing food waste, and fostering healthy eating habits serve as contextual learning tools that instill sustainable values in students naturally and repeatedly. The institutional and human resource aspects of schools are crucial pillars in the MBG policy integration model. Teachers and education personnel act as facilitators, connecting the meal program, the learning process, and character development. By strengthening educator capacity, the MBG can be integrated into thematic learning that links nutrition, health, and the environment. Thus, the program does not operate in isolation but becomes part of an educational ecosystem that simultaneously supports the psychological development and development of green human resources.

The sustainable MBG integration model also emphasizes the importance of collaboration across stakeholders, including government, schools, families, and local communities. Parental support in implementing healthy eating patterns and environmentally friendly behaviors at home will reinforce the values children learn at school. Furthermore, the involvement of the community and local businesses in providing nutritious food creates a reciprocal relationship between schools and the surrounding environment, while supporting sustainable local economic development. Overall, an effective Free Nutritious Meals policy integration model is one that synergizes nutritional fulfillment, psychological development, and the formation of green human resources within a single, planned and sustainable policy framework. With this approach, MBG not only contributes to improving the health and academic achievement of elementary school students but also lays the foundation for the formation of a generation that is physically healthy, psychologically mature, and aware of and responsible for environmental sustainability from an early age.

3. Conclusion

Based on the results of the discussion and analysis that have been carried out, the following points can be concluded:

1. The nutritional status and consumption patterns of elementary school students still present challenges in the form of nutritional disparities, both undernutrition and a tendency to consume unhealthy foods. The Free Nutritious Meal Program plays a crucial role as an early intervention in improving this situation by providing balanced, nutritious meals in the school environment.
2. The Free Nutritious Meal Program has a positive impact on students' psychological development, particularly in improving concentration, motivation, and school attendance. Adequate nutrition has been shown to be a crucial foundation for children's mental and emotional readiness for learning.
3. MBG contributes to fostering healthy eating behaviors and sustainable lifestyles, both within schools and families. The promotion of nutritious food consumption, indirect nutrition education, and environmentally friendly practices in schools encourage changes in children's behavior and raise parental awareness of the importance of nutrition and sustainability.

4. The integration of green human resource values into the implementation of the MBG (Green Governance Program) has begun to be implemented, particularly through the use of local food, managing the eating environment, and promoting healthy behaviors. However, the implementation of these values remains unstructured and requires policy strengthening and increased human resource capacity in schools.
5. An effective integrated model for the MBG policy must be holistic and sustainable, linking nutritional needs, psychological development, and character building of green human resources within a single basic education policy framework. Collaboration between the government, schools, families, and communities is key to successfully making MBG a strategic instrument for human resource development from an early age.

REFERENCES

- Adolphus, K., Lawton, C.L., & Dye, L. (2021). The effects of breakfast on behavior and academic performance in children and adolescents. *Nutrients*, 13(2), 1–18
- Arifin, IW, Harahap, HH, & Rajagukguk, FRS (2024). The influence of green marketing techniques on consumer loyalty to environmentally friendly products with an evaluation of green pricing techniques as a mediating variable. *Accounting Progress*, 3(2), 123–132
- Arifin, IW, Harahap, HH, & Rajagukguk, FRS (2025). Optimizing the management of the Kampung Tahu Dolok Manampang tourism business through product innovation and digital marketing. *Scientific Publication in the Field of Community Service (SIKEMAS)*, 3(4), 125–138
- Arifin, IW, Harahap, HH, & Rajagukguk, FRS (2025). The impact of green marketing techniques on consumer purchasing decisions in organic product companies in North Sumatra through product quality perception as an intervening variable. *International Journal of Economics, Management and Accounting (IJEMA)*, 2(8)
- Arifin, IW, Masyitah, E., Harahap, HH, Rajagukguk, FRS, Rasmewahni, R., et al. (2025). Digital transformation and packaging innovation: Strategies to increase the competitiveness of brown sugar and chip MSMEs in Pelangiran Laut Tador Village. *Community Service Progress*, 4(2), 71–76
- Arifin, IW, Rajagukguk, FRS, & Harahap, HH (2025). Analysis of the influence of word of mouth and brand equity on iPhone purchasing decisions in Tebing Tinggi City. *Management and Business Progress*, 4(1), 1–9
- Bundy, D.A.P., de Silva, N., Horton, S., Jamison, D.T., & Patton, G.C. (2021). Reimagining school feeding: A high-return investment in human capital and local economies. World Bank Group
- Bundy, D. A. P., Silva, N. de, Horton, S., Jamison, D. T., & Patton, G. C. (2022). Re-imagining school feeding: A high-return investment in human capital and local economies. World Bank Group
- Charlton, K., Comerford, T., Deavin, N., & Walton, K. (2020). Latest evidence on impact and implementation of school-based food and nutrition education interventions. F.A.O
- Drake, L., Fernandes, M., Aurino, E., Kiamba, J., & Giyose, B. (2021). School feeding programs in the 21st century: Impacts, sustainability, and future directions. *Food and Nutrition Bulletin*, 42(2), 1–12
- Evaluating the Impact of Indonesia's National School Feeding Program (ProGAS). (2025). PubMed
- Food and Agriculture Organization (FAO). (2023). School food and nutrition frameworks for sustainable development. F.A.O
- Grantham-McGregor, S., Fernald, LCH, Kagawa, R., & Walker, S. (2020). Effects of integrated child development and nutrition interventions on cognitive outcomes. *The Lancet Child & Adolescent Health*, 4(5), 369–382
- Harahap, HH, Rajagukguk, FRS, & Arifin, I. (2024). The role of green financing in promoting a green economy in the micro, small, and medium enterprise sector in North Sumatra. *Economic Development Progress*, 3(2), 122–133
- Harahap, HH, Rajagukguk, FRS, & Arifin, I. (2025). The influence of public policy on the implementation of green technology and blue innovation in supporting a circular economy. *Sibatik Journal: Scientific Journal of Social, Economic, Cultural, and Technology*, 2(1)
- Harahap, HH, Rajagukguk, FRS, & Arifin, IW (2025). Analysis of the impact of green policy and environmentally friendly supply chain management on competitive advantage through green technology adaptation as an intervening variable. *International Journal of Economics, Management and Accounting (IJEMA)*, 2(8)

- Harahap, HH, Rajagukguk, FRS, Arifin, IW, Dinata, R., Rabiula, H., & Murniati, N. (2025). The role of green technology innovation in mediating the influence of green policy on sustainable national economic policy. *Economic Development Progress*, 4(1), 1–14
- Jusriani, R., & Zulfitrwati. (2024). Balanced nutrition education for elementary school children. *Research and Community Service Center*
- Kartika Sari, A., & Dora, N. (2024). Student learning concentration as viewed from the perspective of parents' role in preparing diet patterns and nutritional adequacy. *Undiksha Scientific Journal of Guidance and Counseling*
- Mowilos, R.C., Kaurow, J., Essing, I., Toporundeng, F.O., & Naharia, G. (2025). Analysis of free nutritious meal policies in elementary schools: A systematic review of the literature. *Paradigma Journal*
- Purba, RW, Batubara, RW, Siahaan, R., Lubis, FH, & Rajagukguk, FRS (2024). The impact of taste, product availability, and discounts on customer loyalty at Irian Supermarket Dept. Store Tebing Tinggi. *Jesya (Journal of Economics and Sharia Economics)*, 7(1), 314–321
- Putri, DN, Anggriani, E., Arfah, Y., & Rajagukguk, FRS (2025). The influence of electronic word of mouth (E-WOM), menu variants, and price perceptions on purchasing decisions at Bakso Ummu Akbar Tebing Tinggi. *Jurnal Ilmiah Edunomika*, 9(2)
- Rajagukguk, FRS (2024). Marketing psychology factors in influencing consumer behavior: Decoy effect of purchasing more expensive products. *Economic Development Progress*, 3(1), 65–74
- Rajagukguk, FRS, Arifin, IW, & Harahap, HH (2025). Analysis of the influence of green HR on employee job satisfaction in eco-friendly hotels in Lake Toba with work environment as an intervening variable. *International Journal of Economics, Management and Accounting (IJEMA)*, 2(8)
- Rajagukguk, FRS, Harahap, HH, & Arifin, IW (2024). Implementation of green human resource practices and methods for implementing green HR practices to reduce carbon footprint in industry. *Economic Development Progress*, 3(2), 92–102
- Rajagukguk, FRS, Harahap, HH, & Arifin, IW (2025). The relationship between adolescent self-regulation levels and entrepreneurial readiness in adulthood: A case study in North Sumatra. *Management and Business Progress*, 4(2), 123–137
- Rajagukguk, FRS, Harahap, HH, Arifin, IW, Hutajulu, LR, & Juanda, A. (2025). The effectiveness of psychological selling techniques in increasing sales with customer commitment as an intervening variable: A study of the e-commerce industry in Indonesia. *Digital Business Progress*, 4(1), 1–14
- Rajagukguk, FRS, Harahap, HH, Arifin, IW, Sitindaon, N., & Suwadi, S. (2025). Transformation of oyster mushroom MSMEs towards a smart economy: Strengthening the economy of Block 10 Village through technology and innovation. *Scientific Publication in the Field of Community Service (SIKEMAS)*, 4(1), 13–26
- Ratnasari, D., & Purniasih, L. (2025). Food consumption patterns and nutritional status in school-age children. *Scientific Journal of Health Nutrition*
- Ruel, M. T., & Alderman, H. (2021). Nutrition-sensitive interventions and programs: How can they help to accelerate progress in improving maternal and child nutrition? *The Lancet Global Health*, 9(1), e12–e13
- Ryan, R.M., & Deci, E.L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective. *Contemporary Educational Psychology*, 61, 101860
- UNESCO. (2024). *School health and nutrition: Education for sustainable development*. UNESCO Publishing
- UNICEF. (2022). *The state of the world's children: Children's food environments*. UNICEF
- World Food Programme. (2023). *State of school feeding worldwide 2023*. Rome: WFP
- World Health Organization (WHO). (2021). *Guideline on school-based nutrition interventions*. WHO