

The Strategic Role of Stakeholders in Stunting Alleviation through the MACTOR Method

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ABSTRACT

Research Originality: This research is original because it uses a MACTOR analysis to examine the roles and interactions of stakeholders in stunting alleviation and their impact on improving the quality of human resources in Jember Regency.

Research Objectives: This study aims to analyze the roles, interests, and influence of key stakeholders involved in stunting alleviation and to assess how their coordination contributes to improving human resource quality in Jember Regency.

Research Methods: This research employs a mixed-methods approach, using the MACTOR method, to examine stakeholder relationships. Data were collected through interviews, document analysis, and secondary data related to stunting and human development indicators.

Empirical Results: The findings indicate that stakeholder roles in stunting alleviation are uneven, with limited coordination and varying levels of influence. Weak synergy among actors reduces the effectiveness of stunting reduction programs and their impact on human resource quality.

Implications: These results suggest the need for stronger stakeholder coordination, clearer role distribution, and integrated policies to enhance stunting alleviation and support sustainable human resource development in Jember Regency.

Keywords:

stunting; sustainable development; actor; coordination.

How to Cite:

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INTRODUCTION

Development is a continuous process with the primary objective of improving the standard of living and community welfare. Efforts to enhance human resource quality need to be initiated early in society. Human resources are a crucial factor in driving regional economic growth (Saleh et al., 2020). Quality development requires long-term investment in humans as the primary agents of development. Countries or regions that succeed in fostering healthy, intelligent, and productive generations will achieve higher economic competitiveness. Conversely, if human capital quality is low due to limited access to basic needs such as nutrition, education, and health, the development process will proceed slowly or may even stagnate (Wayes, 2024). One of the main obstacles to creating high-quality human resources is stunting. According to the World Health Organization (2015), stunting is a growth and developmental disorder in children characterized by a height-for-age below the standard due to chronic malnutrition and recurrent infections, which adversely affect physical, cognitive, and future productivity (Arqam et al., 2026; Oyenubi & Rossouw, 2024).

The accelerated stunting reduction program constitutes one of Indonesia's national priority initiatives. East Java Province is among the twelve provinces designated as priority regions for the implementation of this program. Given its large population and extensive territory, East Java has considerable potential to contribute to the overall success of national stunting reduction efforts (Hariani et al., 2023). According to data compiled by the East Java Provincial Government, ten cities and regencies have been identified as primary priority areas for accelerating stunting reduction. These regions are prioritized because stunting prevalence rates exceed 20 percent, including Jember Regency (Muffihah et al., 2024).

Table 1. Comparison of Stunting Prevalence in East Java and Jember Regency

Year	East Java (%)	Jember Regency (%)
2019	26,86	37,94
2020	-	-
2021	23,5	23,9
2022	19,2	34,9
2023	17,7	29,7

Sources: Susenas & SSGBI (2019); SSGI (2021); SSGI (2022); SKI (2023).

Table 1 shows data from 2019 to 2023, indicating that Jember Regency consistently recorded higher prevalence rates compared to the East Java provincial average. In 2019, the prevalence in Jember reached 37.94%, significantly above East Java's 26.86%. Data for 2020 were unavailable; however, in 2021 Jember experienced a notable decline to 23.9%, nearly equal to the provincial average of 23.5%. Nevertheless, in 2022, the situation in Jember worsened sharply, increasing to 34.9%, in contrast to East Java, which continued to decline to 19.2%. In 2023, Jember showed improvement with a decrease to 29.7%, yet the figure remained considerably higher than the provincial average, which further declined to 17.7%.

International evidence indicates that stunting can hinder economic growth and reduce labor productivity, potentially resulting in a 11% loss of Gross Domestic Product (GDP) and a 20% decline in adult worker earnings. Moreover, stunting contributes to widening inequality, reducing approximately 10% of lifetime earnings, and can trigger intergenerational poverty (poverty traps) (TNP2K, 2017). High socioeconomic disparities across regions in Indonesia are among the factors contributing to elevated stunting rates.

The issue of stunting in a region cannot be separated from its socioeconomic conditions. Social factors, including parental education level, occupation type, and income, play a significant role in determining children's access to adequate nutrition and health services (Prayitno et al., 2025). Various studies show that the roles of government, health services, and the community are important in reducing stunting. Research by Astuti et al. (2025), Jalloh et al. (2025), Orimadegun et al. (2025), and Supranoto et al. (2025) confirms that stakeholder collaboration, community social capital, a multisectoral approach, national health policies, and improved welfare are crucial to successfully combating stunting. From a health service perspective, a meta-analysis study shows that children in highland areas are at higher risk of stunting due to limited access to health services (Rosyada et al., 2026).

However, several other studies have shown conflicting results. Research by Hamzah et al. (2025) found that village funds and fiscal decentralization in Indonesia had a positive effect on stunting, suggesting weak policy effectiveness at the regional level. In Magelang, Central Java, the national stunting reduction program has not been running optimally due to low maternal knowledge, inappropriate parenting patterns, and weak program coordination (Ashar et al., 2025). Meanwhile, in Indonesia, unmet health care needs were found to be positively correlated with stunting prevalence (Rahardiantoro et al., 2024). From a poverty perspective, in Indonesia, high poverty rates are associated with increased stunting risk (Aswi et al., 2025; Rahardiantoro et al., 2024). It can therefore be concluded that high poverty rates are among the main contributors to stunting, as economic constraints limit community access to nutritious food, healthcare, and adequate sanitation (Pradhan et al., 2023). Jember Regency is among the regions in East Java with relatively high poverty rates compared to other districts and municipalities.

Table 2. The Five Regencies/Municipalities with the Highest Number of Poor Population in East Java, 2021–2023.

Regency/City	Number of Poor Population (in Thousands)		
	2023	2022	2021
Malang	251,36	252,88	276,58
Jember	236,46	232,73	257,09
Sampang	221,71	217,97	237,23
Sumenep	206,1	206,2	224,73
Probolinggo	205,02	203,23	223,32

Source: Statistic Indonesia (2024)

Table 2 shows that the number of poor residents in Jember Regency has fluctuated from year to year. Based on this comparison, Jember consistently ranked second in East Java with the highest number of poor residents. This condition indicates that poverty in Jember Regency is relatively more severe compared to most other regencies/municipalities. The high poverty rate in Jember also has implications for various other development issues, including the high prevalence of stunting, since socioeconomic conditions are among the main contributing factors to stunting in children. This is supported by the findings of Ulfah & Nugroho (2020), which revealed that employment and income problems are key drivers of stunting in Jember Regency.

High poverty levels further increase the risk of stunting in future generations, creating a recurring cycle that is difficult to break without comprehensive interventions. The lower the poverty rate, the higher the population's welfare (Zhao & Zhao, 2025). Low-income families generally face limited access to nutritious food, healthcare services, clean water, and proper sanitation, all of which are essential factors for child growth (Pradhan et al., 2023). In the long term, children born and raised in poverty are at greater risk of experiencing stunting and declining human resource quality. Therefore, stunting alleviation cannot be separated from comprehensive and sustainable poverty reduction efforts.

This study differs from previous research in that it uses a MACTOR analysis, which focuses on the roles and interactions of stakeholders in stunting alleviation rather than solely on health or nutritional interventions. It adopts an actor-based analytical approach to examine stakeholder influence, interests, and coordination, framing stunting as a human resource development and regional development issue. Therefore, this study is crucial for analyzing the roles of actors in stunting alleviation efforts to improve human resource quality in Jember Regency. Accordingly, the findings of this research are expected to provide relevant policy recommendations for the government and stakeholders.

METHODS

This study employs a mixed-methods approach combining qualitative and quantitative techniques to comprehensively analyze stakeholder roles in stunting alleviation in Jember Regency (Monica & Yaswinda, 2021). The purpose of employing a mixed-methods approach is to obtain numerical data that are subsequently reinforced through in-depth explanatory analysis of the collected and processed data, thereby producing more comprehensive and holistic research findings (Komarolya, 2025). The primary analytical tool used is MACTOR (Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations), which is designed to map stakeholder influence, interests, and interactions within policy implementation (Kadaifci, 2024). The application of MACTOR enables a more systematic analysis of inter-actor relationships, allowing the identification of effective collaborative strategies to reduce the economic impacts of stunting.

The data used in this study consists of both primary and secondary data. Primary data were collected through structured interviews and questionnaires administered to key

stakeholders involved in stunting reduction programs, including government agencies, health workers, community organizations, and household representatives. The questionnaires were designed to capture actors' perceptions regarding their level of influence, dependency, interests, and attitudes toward stunting alleviation objectives. Secondary data were obtained from official government reports, statistical publications, and relevant policy documents related to stunting, poverty, and human resource development in Jember Regency.

The population in this study comprises all stakeholders involved in stunting-reduction policies in Jember Regency, including government institutions, at-risk families, and stunting-free families. The sampling technique employed is purposive sampling, which involves selecting respondents based on specific criteria considered capable of providing relevant information for the research. Actors from government institutions and community organizations were selected based on their expertise and competence in their respective fields. Meanwhile, several actors, particularly at-risk and stunting-free families, were selected based on being parents of stunted or non-stunted children (aged 0–59 months), with a focus on the district with the highest stunting prevalence in Jember Regency in 2023, namely Kaliwates District.

Table 3. Actors and Objectives

Actors	Objectives
Health Agency (HA)	Improving access to and the quality of health services.
Food Security and Livestock Agency (FSLA)	Ensuring the availability of and access to nutritious food.
Regional Development Planning Agency (RDPA)	To coordinate cross-sectoral planning in accelerating stunting reduction. Integration of stunting alleviation programs into regional development planning and local government budgeting.
Women's Empowerment, Child Protection, and Family Planning Agency (WECPPA)	Education on family planning, parenting practices, and maternal and child health.
Institution	Academic support through research and education.
Midwives	Early detection and intervention measures to address stunting risk.
Posyandu Cadres	Monitoring the growth and development of children, accompanied by nutrition and health education.
Family Welfare Empowerment Team (FWET)	Promoting active community participation in stunting prevention efforts.
Stunting-Risk Family (SRF)	Enhancing nutritional awareness.
Stunting-Free Families (SFF)	Role model in practicing parenting and nutritious food consumption within the community.

Score Description:

0 = no influence

1 = low influence

2 = moderate influence

3 = strong influence

4 = very strong influence

The data obtained from the questionnaires were subsequently processed and analyzed using the MACTOR method to identify and map the roles, interests, and influence of each actor in stunting reduction efforts in Jember Regency. MACTOR is applied to examine the power relations, interconnections, and patterns of collaboration among actors or stakeholders (Priyono et al., 2025). This method generally reveals each actor's perceptions and preferences regarding the goals to be achieved. Furthermore, the analysis identifies isolated actors or stakeholders with low levels of influence and dependency, as well as bridging actors characterized by high levels of both influence and dependency. In addition, relative strength is used as a basis for comparison to identify the actors or stakeholders with the greatest influence (Yilmaz & Karadayi-Usta, 2025).

The stages of MACTOR analysis consist of several steps, namely: (1) identifying the system actors; (2) determining a set of objectives to be achieved; (3) describing the power relations among actors, measured on a scale from 0 (no influence) to 4 (very strong influence); and (4) assessing the actors' attitudes toward the objectives based on their level of resistance, using a scale of (+) support, (0) neutral, and (-) oppose, as well as evaluating the importance of each objective for the actors on a scale from 0 (not important) to 4 (very important) (Rees & MacDonell, 2017).

Table 4. Matrix Mactor

MDI	Health Agency	FSLA	RDPA	WECPFPA	Institution	Midwives	Posyandu Cadres	FWET	SRF	SFF
Health Agency	0	3	4	3	3	4	4	3	3	3
FSLA	3	0	3	3	3	3	3	2	1	1
RDPA	3	1	0	3	2	3	3	2	3	3
WECPFPA	1	3	2	0	3	3	3	2	3	3
Institution	3	1	2	3	0	3	3	3	1	1
Midwives	3	2	3	4	3	0	3	3	3	2
Posyandu Cadres	2	3	3	3	3	4	0	3	2	2
FWET	2	3	3	3	1	3	3	0	2	2
SRF	2	2	2	3	2	3	3	2	0	3
SFF	2	2	2	3	2	3	3	2	2	0

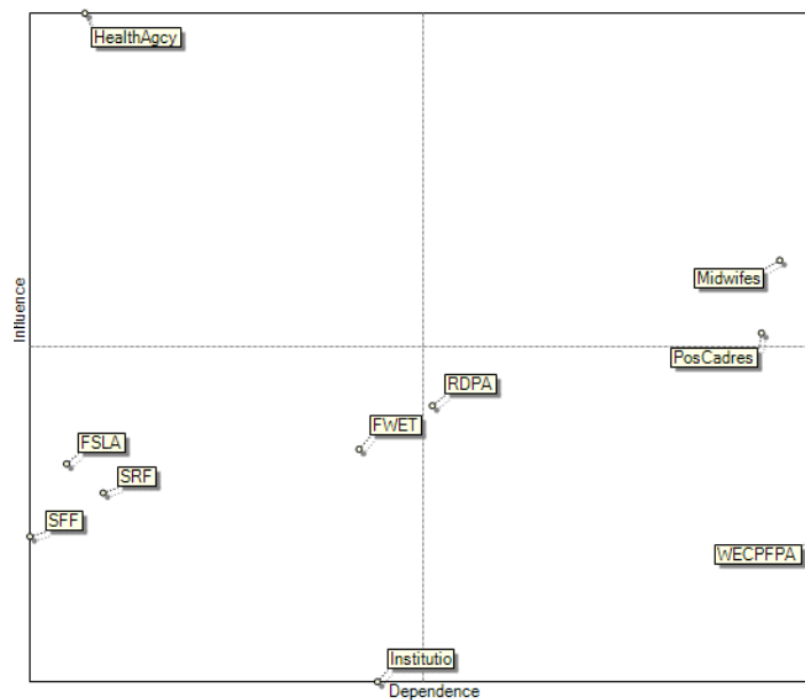
Source: Primary data, processed (2025).

Table 4 presents an example of an MACTOR matrix illustrating the level of influence among actors involved in stunting alleviation efforts in Jember Regency. Each cell in the matrix indicates the extent to which one actor influences another, with values ranging from 0 (no influence) to 4 (very strong influence). This matrix identifies key actors with substantial influence over the system, as well as strategic actors to prioritize in collaborative policy planning.

RESULTS AND DISCUSSION

Based on the MACTOR analysis of stunting alleviation in Jember Regency aimed at improving human resource quality, it can be concluded that the Health Agency holds a high level of influence with low dependency, playing a central role in enhancing and delivering health services. Midwives and Posyandu cadres demonstrate both high influence and high dependency, as they function as key intermediaries between the health service system and the community. Actors characterized by low influence but high dependency include the Regional Development Planning Agency, which is responsible for development planning and policy integration, and the Women's Empowerment, Child Protection, and Family Planning Agency, which focuses on advocacy for stunting-risk families and early marriage education. Meanwhile, actors with both low influence and low dependency include the Food Security and Livestock Agency, which ensures access to nutritious food; the Family Welfare Empowerment Team, which carries out family education and community empowerment; stunting-risk and stunting-free families as program beneficiaries; and higher education institutions that contribute through scientific studies, research data, and policy recommendations.

Figure 1. Map of Influences and Dependences between Actors



Source: Primary data, processed (2025)

The figure provides an initial depiction of the relative importance of each actor, distinguishing between dominant actors (high influence) and actors that tend to be dominated (high dependency). Additionally, the figure helps identify stakeholders who are less engaged or isolated (low influence and low dependency), as well as bridging or relay actors (high influence and high dependency) (Wardono et al., 2019). Based on the

results of the actor role mapping analysis within the quadrants, it is evident that Quadrant I, known as dominant actors, includes the Health Agency. This actor is considered the most influential, having high influence but low dependency. The analysis results indicate that the Health Agency has a high influence and low dependency in stunting reduction efforts. The findings align with research by Rahardianto et al. (2024), which shows that government interventions aimed at improving education, access to healthcare, and poverty reduction can help reduce stunting in Indonesia.

Furthermore, Sianti et al. (2024) emphasize that the Health Agency plays the most dominant role in implementing specific stunting interventions. In relation to Booth's (1996) poverty theory, the Health Agency addresses personal and physical factors as well as access limitations through various stunting prevention and management programs, improvements in maternal and child nutrition services, and the provision of basic health services that are easily accessible to low-income populations. Limited access to health services, a key factor in poverty, can also be mitigated through the Health Agency's efforts to expand the reach of community health centers, Posyandu, and health insurance programs.

In Quadrant II, referred to as relay actors, there are midwives and Posyandu cadres, who exhibit both high influence and high dependency. Their position indicates that midwives and Posyandu cadres play a crucial role in driving stunting reduction in Jember Regency. The influence of midwives is particularly significant, as they serve as the primary intermediaries between the health care system and the community. These findings align with Irdawati et al.'s (2024) research, which showed that health counseling provided to cadres improved knowledge scores in both the control and treatment groups. Although there were no significant differences, the results showed that the use of media in healthcare services could yield better results than the cadres' knowledge scores. They directly assist pregnant women, monitor child growth, and conduct community nutrition education. By routinely organizing Posyandu activities and distributing supplementary food for at-risk children, they facilitate access to health and nutrition services for low-income communities, thereby improving human capital and helping break the cycle of poverty. This supports Anne Booth's poverty theory, which identifies personal, physical, and access-related factors as key contributors to poverty. Through their efforts, midwives and Posyandu cadres help reduce these barriers to basic health services.

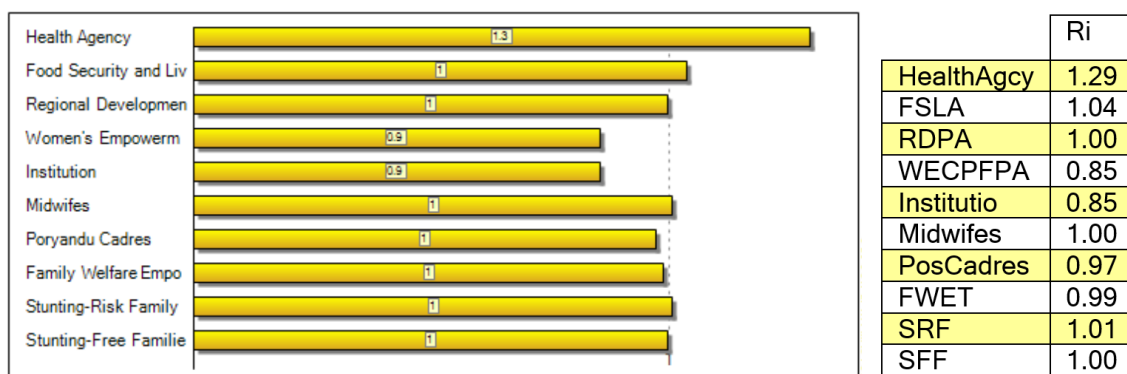
Quadrant III, or dominated actors, includes the Regional Development Planning Agency and the Women's Empowerment, Child Protection, and Family Planning Agency, which have low influence and high dependency. The Regional Development Planning Agency primarily functions as a planner and integrator of development policies, including stunting prevention, through the Regional Medium-Term Development Plan and Regional Government Work Plan documents; however, implementation relies on technical agencies in the field. According to Anne Booth's (1996) poverty theory, the Regional Development Planning Agency addresses access and economic factors. As a planning and coordinating actor, the Regional Development Planning Agency formulates strategies to address stunting and poverty by integrating cross-sectoral programs, ensuring budget availability, prioritizing nutrition and public health, and aligning the efforts of the Health Agency

and other stakeholders. By expanding access to health services and strengthening nutrition interventions through effective planning, the Regional Development Planning Agency helps reduce barriers to access and improve the economic conditions of low-income communities, thereby helping break the cycle of poverty.

Meanwhile, the Women's Empowerment, Child Protection, and Family Planning Agency primarily addresses socio-cultural, personal, and physical factors. The agency focuses on family education, women's empowerment, child protection, and family planning services to prevent early marriage and manage high-risk births that contribute to stunting. Through outreach and empowerment programs, Women's Empowerment, Child Protection, and Family Planning Agency seeks to influence community attitudes and behaviors regarding reproductive health, childcare practices, and the importance of nutrition from pregnancy onward. Consequently, the Women's Empowerment, Child Protection, and Family Planning Agency not only contributes to reducing stunting but also strengthens family foundations, promoting healthier, more productive households capable of escaping poverty.

Lastly, Quadrant IV consists of actors with both low influence and low dependency. Their role in stunting reduction remains limited and non-dominant in strategic decision-making or cross-sectoral program coordination. The Food Security and Livestock Agency plays an important role in supporting household food security and nutritional adequacy. However, its direct influence on specific stunting interventions, such as health services and nutrition education, is minimal and supplementary. Similarly, the Family Welfare Empowerment Team's role is primarily promotive and educational through cadres and community activities. However, they are not actively involved in policy design or program formulation at the regency level. At-risk families and stunting-free families are program targets rather than decision-makers, resulting in relatively low influence and dependency on other actors. Meanwhile, universities generally lack direct authority over strategic decision-making, particularly for projects implemented by the government or the private sector.

Figure 2. Actor Competitiveness Diagram

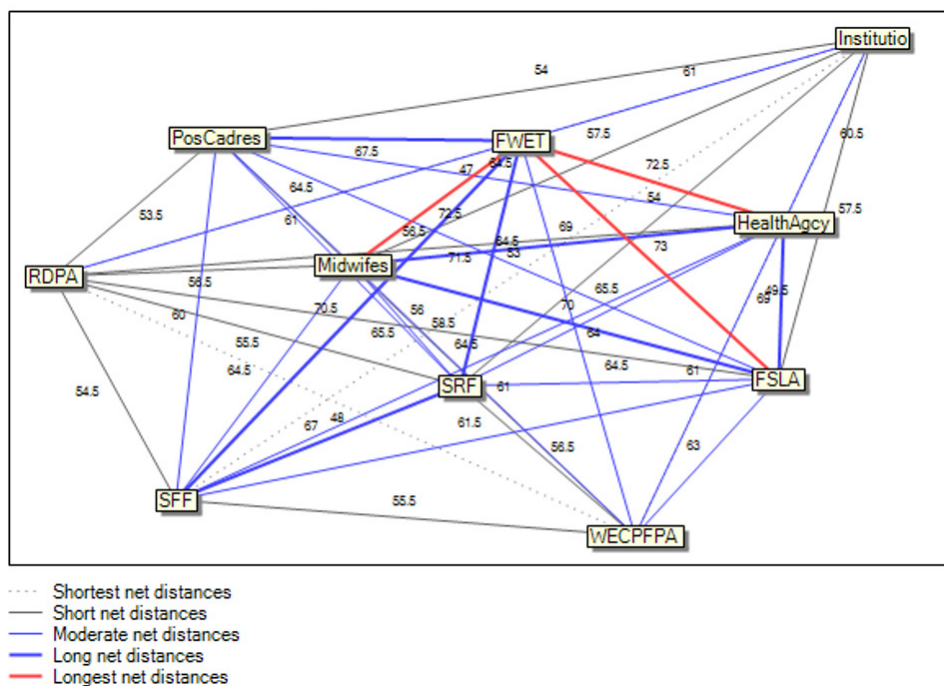


Source: Primary data, processed (2025)

Figure 2 presents a histogram of each actor's competitiveness levels. Actors or stakeholders with a value greater than 1 are categorized as having high competitiveness,

whereas values below 1 indicate low competitiveness. Several actors with significant roles, either through direct or indirect influence, in other words, those with high competitiveness, include the Health Agency, the Food Security and Livestock Agency, and at-risk families. These actors occupy strategic positions in stunting reduction efforts and have the potential to impact economic outcomes positively. The Health Agency has the highest score of 1.29, indicating that it is the most influential actor in decision-making, coordination, and the implementation of stunting reduction strategies. This result aligns with the Health Agency's primary role as the implementer of specific stunting intervention programs. The Food Security and Livestock Agency, for instance, ensures the availability and access to nutritious food, which is a crucial foundation for improving the quality of human capital. Meanwhile, the involvement of at-risk families highlights the importance of community participation in supporting program success. Through the synergy of all these actors, not only can improvements in child nutritional status be achieved, but sustainable enhancement of human capital is also promoted, contributing to long-term economic growth.

Figure 3. Distance Between Actors

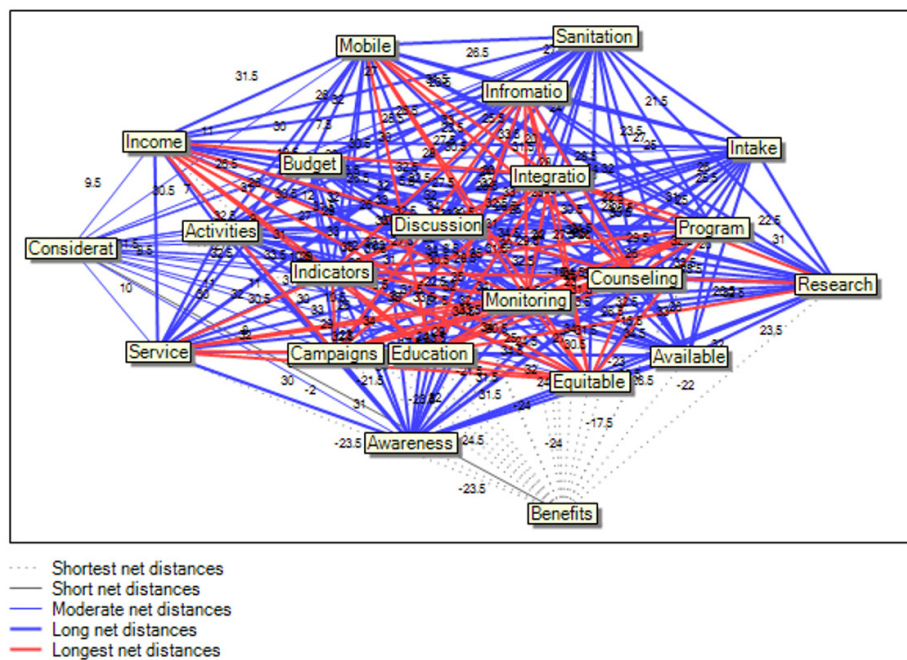


Source: Primary data, processed (2025)

Figure 3 presents a graph illustrating the relationships among actors, depicting the potential for collaboration among stakeholders. Similar to the inter-objective distance graph, this graph also distinguishes connectivity levels using line colors. Based on the analysis, actors with strong potential for collaboration in stunting reduction include the Health Agency, the Food Security and Livestock Agency, midwives, and the Family Welfare Empowerment Team. This finding aligns with (Apriliani et al., 2023), who stated that the

synergy among the Health Agency, the Food Security and Livestock Agency, midwives, and the Family Welfare Empowerment Team demonstrates strong collaborative potential in stunting reduction due to their complementary roles. Their interventions directly target factors contributing to poverty, as described by Anne Booth (1996). According to Booth, poverty is not solely caused by economic limitations but also by socio-cultural, personal, and physical factors, as well as limited access to basic services. These four actors address these issues in different ways: the Health Agency and midwives reduce access barriers and address personal and physical constraints through health and nutrition services; the Food Security and Livestock Agency addresses economic constraints by ensuring the availability of nutritious food and promoting the livestock sector; while Family Welfare Empowerment Team targets socio-cultural aspects and access limitations through family education and community empowerment. Through this cross-actor collaboration, stunting reduction efforts become more comprehensive, encompassing health, nutrition, food access, and community empowerment. Such collaboration ensures that obstacles arising from economic, socio-cultural, or geographic limitations can be simultaneously mitigated.

Figure 4. Distance Between Objectives



Source: Primary data, processed (2025)

Figure 4 presents a graph of distances between objectives, illustrating the degree of connectivity between actors and each objective. Similar to the previous graph, differences in actor relationships are indicated by line colors: gray for weak connections, blue for moderate connections, and red for strong connections. This graph is useful for identifying each actor's position or stance toward specific objectives, whether supportive or not. The visualization also depicts the relationships among objectives based on a scale derived from the differences between convergence and divergence values.

The red color indicates strong connections, where objectives such as regional planning integration, nutritional status monitoring, stunting prevention education, supplementary feeding program, family counseling services, community service, information accessibility, university research, regional development indicators, equitable health services, mobile services, income limitations, and early marriage campaigns are highly interconnected. The close linkage among these objectives suggests that achieving one strategic goal, such as strengthening university research or advancing stunting prevention education, can synergistically support the realization of other objectives. For example, robust research from universities can produce evidence-based policy recommendations to enhance supplementary feeding and family counseling programs. Similarly, increased community awareness through education supports early marriage prevention campaigns and nutritional status monitoring services. This result aligns with Atamou et al. (2023), who stated that maternal knowledge, maternal caregiving practices, parental income, utilization of health services, and household sanitation play a crucial role in reducing stunting.

CONCLUSION

Based on the MACTOR analysis of stunting reduction in Jember Regency, aimed at improving human capital, the Health Agency has a strong influence, with low dependency. It plays a central role in strategies such as nutritional status monitoring, supplementary feeding programs, mobile and equitable health services, and improving information accessibility. Midwives and Posyandu cadres exhibit high influence and dependency as key actors in stunting prevention education, family counseling services, community service, and early detection of nutritional problems. Actors with low influence but high dependency include the Regional Development Planning Agency (RDPA), which integrates regional planning through regional development indicators, and the Women's Empowerment, Child Protection, and Family Planning Agency, which focuses on early marriage campaigns and addressing income limitations among at-risk families. Actors with low influence and low dependency include the Food Security and Livestock Agency, which supports supplementary feeding; the Family Welfare Empowerment Team, through family education; universities through research-based policy recommendations; and families as program targets. The Jember Regency Government needs to strengthen cross-sector coordination by positioning the Health Office as a central actor, integrating regional planning, strengthening the roles of midwives and Posyandu cadres, providing support to supporting actors, and utilizing university research to achieve effective and sustainable stunting reduction. Overall, regional planning integration, nutritional monitoring, prevention education, supplementary feeding, family counseling, community service, information accessibility, university research, and early marriage prevention are interconnected strategies requiring strong collaboration among key actors in Jember Regency.

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