



Pentahelix Education: Collaborative Synergy to Reduce Stunting Prevalence

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Abstract: Stunting is a growth failure condition experienced by children under two. Efforts to reduce stunting are carried out through two nutritional interventions: specific and sensitive. The Pentahelix approach is worth studying to foster collaboration and alliance in stunting prevention education. This research aims to develop a Pentahelix educational formulation to strengthen specific and sensitive intervention services for the stunting reduction program in the Jember Regency. The research method used is a mixed methods research type. The mixed methods approach or mixed method approach is a research approach that involves the integration or unification of qualitative and quantitative data research. This research is located in the Jember Regency, with respondents including parents, the community, stunting program managers, and stakeholders. The Pentahelix formulation development research results began with planning the learning program. The first step is to conduct a specific and sensitive service assessment. The assessment results are used to develop an education service menu based on the local context and community needs. The final component is the alliance among the Pentahelix elements. Evidence-based policy collaboration is produced through the cooperation of the government and academics, while the media and community deliver direct education using materials prepared by academics. Business actors help ensure sustainable access by providing infrastructure or supporting products. Academics and the government monitor and evaluate the program's effectiveness for future policy improvements. The results of the Pentahelix-based learning program begin with a community assessment, which is an evaluation process to understand the community's needs and the program's effectiveness.

Keywords: education, sensitive and specific interventions, pentahelix, stunting

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INTRODUCTION

Stunting is one of the serious health issues in Indonesia, including in Jember Regency. Based on national data, the prevalence of stunting in Indonesia remains at a concerning level despite various programs and interventions having been implemented. Stunting occurs due to chronic malnutrition, especially during the first 1,000 days of life, which affects a child's physical and cognitive development. The government has developed a specific and sensitive intervention approach to address this issue. Specific interventions include actions directly related to improving nutrition, such as nutritional supplementation and dietary improvements.

Meanwhile, sensitive interventions focus more on environmental and socio-economic conditions that support the improvement of nutritional status, such as providing clean water, sanitation, and community empowerment. However, efforts to combat stunting cannot rely solely on government intervention. A collaborative approach involving various stakeholders is very important. The Pentahelix concept of collaboration between the government, academics, business actors, the community, and the media can effectively strengthen alliances in implementing stunting prevention programs. Specific and sensitive intervention services are hoped to be optimized through education and active involvement of these five elements.

Based on the Ministry of Health of the Republic of Indonesia in 2022, the prevalence of stunting in East Java in the top three positions are Jember Regency with a rate of 34.9%, Bondowoso Regency with 32%, Situbondo Regency with 30.9%; these percentage values with are the highest compared to other regencies in East Java. The following presents data on the nutritional status of Indonesian toddlers from 2013-2022:

	Results Riskesdas		Results SSGI		
	2013	2018	2019	2021	2022
Stunting	37,6	30,8	27,7	24,4	↓ 2,8 21,6
Wasting	12,1	10,2	7,4	7,1	↑ 0,6 7,7
Underweight	19,6	17,7	16,3	17,0	↑ 0,1 17,1
Overweight	11,8	8,0	4,5	3,8	↓ 0,3 3,5

Figure 1. Trends in the Nutritional Status of Indonesian Toddlers

Interventions designed to reduce stunting in Asian countries require a combination of factors and components that provide the appropriate context (2020), namely specific and sensitive interventions. Specific interventions directly address the causes of stunting and are generally provided by the health sector, such as food intake, infection prevention, maternal nutritional status, infectious diseases, and environmental health. Sensitive interventions are activities related to the indirect causes of stunting, generally outside the health sector. (Baseline, 2021) Several specific and sensitive nutrition interventions have been established in the priority program package for the Acceleration of Stunting Reduction in the National Strategy or National Strategy. This is stated in the Conceptual Framework for the Acceleration of Stunting Reduction in the following image:

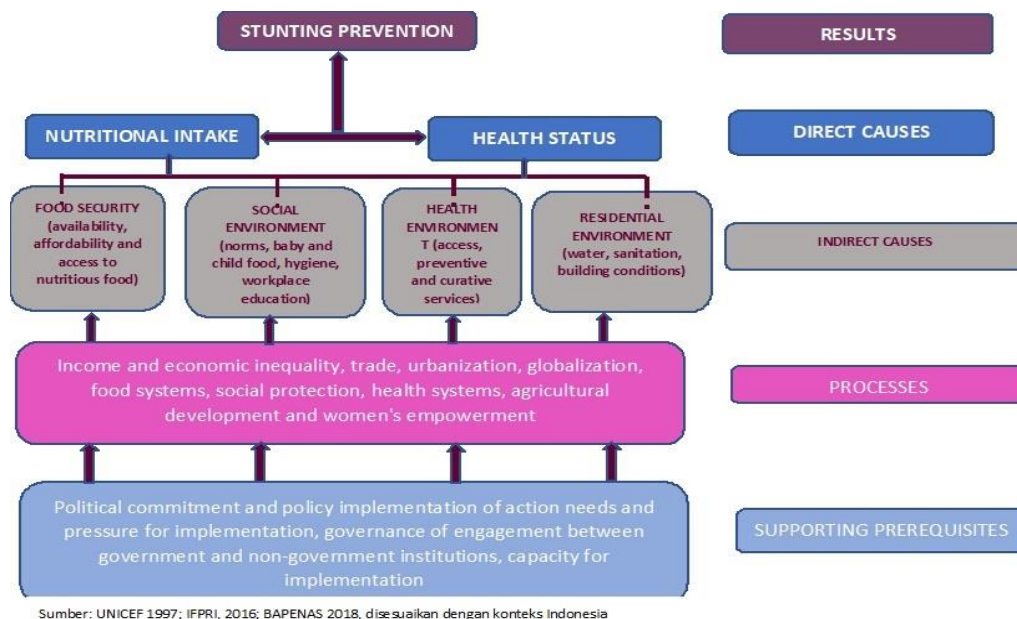


Figure 2. Conceptual Framework for Accelerating Stunting Reduction

Integrating specific and sensitive interventions in a coordinated manner requires collaboration involving at least several parties (Makripuddin, 2021). Pentahelix is a problem-solving framework that prioritizes collaboration among stakeholders. Later on, each stakeholder will represent their position in solving a complex problem. The role of each party through the Penta helix model in addressing the stunting issue in Indonesia: 1) The government, as the policy implementer, has the main task of reducing the stunting rate; 2) Academics play an important role in providing recommendations and reviewing policies as well as forming a science-based society; 3) Business-based companies, through CSR programs, help various parties in addressing social, environmental and health issues such as stunting; 4) Community groups monitor the results of development and problem-solving in the community carried out by the government; 5) The massive dissemination of information through the internet or public service advertisements can educate the public about stunting prevention (Irawan et al., 2023).

Several studies have explored the application of the pentahelix model in efforts to address stunting in Indonesia. The problem of stunting is greatly influenced by various factors, socio-economic factors such as parental occupation, education level, income, and environmental conditions contribute significantly to the incidence of stunting in children. (Faseha et al., 2023; Nugroho et al., 2023; Widaningtyas, 2022; Widyaningsih et al., 2022). Active involvement of parents in quality PAUD programs also plays an important role in preventing stunting. Parents can obtain information and awareness about stunting and how to prevent it. (Eka et al., 2023; Hakimah et al., 2022; Haryanti & Sumarno, 2014; Kusniapuantari & Suryono, 2014; Romadona et al., 2023; Yanuarsari et al., 2021). The role of cadres (BKB, Posyandu, etc.) has also become an important catalyst in efforts to reduce stunting, including through the availability of parent classes, monitoring child growth, and coordination with health services related to the fulfillment of children's nutrition and health. (Dwinandia & Hilmi, 2022; Hilmi et al., 2019; Ishlah et al., 2024; Wiyono et al., 2023). Pentahelix synergy involving various institutions and agencies from government, private, universities, media, and community elements is very necessary for handling stunting (Kusuma et al., 2024; Purbaningrum et al., 2024). Pentahelix collaboration, involving government, academics, communities, the business sector, and the media, has been identified as an effective approach in efforts to reduce stunting (Andayani et al., 2022; Dewanti et al., 2020; Ibrahim et al., 2024; Mansyur et al., 2024; Pardosi & Bratakusumah, 2024; Putri & Hertati, 2023; Toana & Rowa,

2024). These studies show that the application of the pentahelix model can be effective in overcoming stunting problems through cross-sector collaboration. Although specific research on the application of this model in the context of education and parenting is still limited, the principle of multi-stakeholder collaboration promoted by the pentahelix has the potential to be applied in these areas.

Holistic handling of stunting is insufficient in the health sector alone, but socio-economic aspects must also be touched on. This multisectoral collaboration is evident from the involvement of BKKBN, DPA₃KB, BKB Cadres, PKK Team, Villages, Subdistricts, and Health Medical Teams. Thus, the Pentahelix Formula can be a solution for achieving Sustainable Development, marking an important moment for the world to improve human quality by establishing nutrition and health-related goals (Khuzaimah et al., 2021). Therefore, an approach is needed to understand better how sustainable development goals, divided into three main pillars (social, environmental, and economic), can help address nutritional issues, especially in Jember Regency. Based on the issues mentioned, the problem formulation in this research is "How is the Pentahelix Education Formulation in Strengthening Specific and Sensitive Intervention Services for the Stunting Reduction Program in Jember Regency?"

METHOD

1. Research Design

This research aims to develop an Educational Pentahelix model to strengthen specific and sensitive intervention services in the Stunting mitigation program in the Jember Regency. This study focuses on the educational approach in solving the problem of stunting because the problem of stunting is not only a matter of providing nutritious food, but there needs to be strengthening of community knowledge. The formulation of Pentahelix education in strengthening specific and sensitive intervention services as a solution to the problem of stunting prevalence in the community while providing educational services for parents regarding parenting and healthy lifestyles in the family. The five synergistic pentahelix components have their respective contributions that are interrelated, the first in terms of Academics, acting as a conceptor, namely being a source of knowledge with relevant theoretical concepts; the second Private, acting as an enabler; the third Community, acting as an accelerator; the fourth Government, acting as a regulator. The government in this case acts as a regulator that has regulations and controllers that are responsible for implementing the program; finally the Media in this case has a role as a supporter of publication of the program to be run. If classified based on the objectives to be achieved through the formulation of activities, this research uses a mixed-methods approach.

According to Creswell & Plano Clark (2018), the mix method is very effective for research aimed at developing community-based intervention models and public policies. This approach allows researchers to describe phenomena more completely by combining objective and subjective data. The mixed-methods approach is a research approach that involves the integration or unification of qualitative and quantitative data. Qualitative data tends to be open-ended without predetermined responses, while quantitative data usually includes closed responses such as those found in questionnaires and instruments (Waruwu, 2023). The design of the mixed-methods approach in this research is the Sequential Explanatory Design model. This model involves the collection and analysis of data in the first phase, which is quantitative data, and the collection and analysis of data in the second phase, which is qualitative data, (Waruwu, 2023).

This design is also known as a two-phase design, where researchers in the first phase collect and analyze quantitative data and then identify results for follow-up. In the second phase, researchers collect and analyze qualitative data and interpret the results. A two-phase design or model aims to ensure that integrating quantitative and qualitative data can generate

additional insights beyond the information obtained from quantitative or qualitative data alone. The stages of the research design are presented in the following figure:

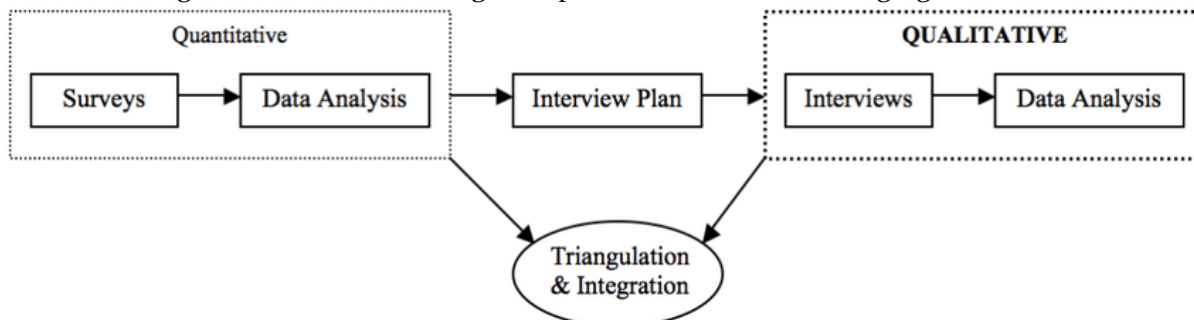


Figure 3. Exploratory sequential design research stage

The following is an explanation of the stages in the Exploratory Sequential research design:

This study uses quantitative data to see the extent of the implementation of specific intervention programs and sensitive interventions in reducing stunting in the Jember Regency. Quantitative data is obtained through distributing survey questionnaires to the community in the Jember Regency. Meanwhile, qualitative data is chosen to prove the factors that support and hinder the implementation of stunting reduction programs, particularly in implementing specific and sensitive intervention programs for the community and stakeholders. Qualitative data is obtained through follow-up interviews based on respondents who have completed the questionnaires. The interview was conducted offline by meeting directly in the predetermined community environment.

The implementation of the mix method in this study began with the collection of qualitative data through in-depth interviews and Focus Group Discussions (FGD) with representatives of the pentahelix, namely local governments, academics, communities, media, and business actors. This data is used to understand the perspectives, needs, and roles of each element of the pentahelix in strengthening stunting intervention services. After that, quantitative data was collected using questionnaires and surveys to parents of toddlers and posyandu cadres to obtain an overview of the level of participation, parents' understanding of child nutrition, and the impact of the intervention program on reducing stunting rates. The results of these two approaches were then analyzed separately before being integrated to obtain a more complete understanding of the effectiveness of the pentahelix education model.

The integration of quantitative and qualitative data was carried out through a data triangulation process, where findings from interviews and FGDs were compared with survey data to ensure consistency and validity of the research results. Quantitative data provide an overview of the program's impact, while qualitative data provide the social and cultural context that influences the program's success. With this method, the study is expected to be able to produce an evidence-based and contextual pentahelix education model, so that it can strengthen specific and sensitive intervention services in supporting the reduction of stunting rates in Jember Regency.

2. Time and Place of Research

This research was conducted from June to November 2024, located in Jember Regency covering three sub-districts, namely a) Rambipuji Sub-district, b) Kaliwates Sub-district, and c) Ledokombo Sub-district. The reason for selecting these three sub-districts as research locations is related to implementing the Great Parent School (SOTH) program, which is closely linked to community education programs on parenting in addressing stunting issues. Moreover, with the emergence of new trends related to the Sustainable Development Goals (SDGs) number 2, which aims to eliminate hunger, achieve food security and improved nutrition, and promote sustainable agriculture, these issues must be addressed through

policies and implemented programs to accelerate the reduction of stunting in a holistic, integrative, and quality manner through coordination, alliance, and synchronization among ministries/agencies, provincial governments, district/city governments, village governments, academics, and stakeholders.

3. Population and Sample

The population of this study consists of all participants of the Great Parent School (SOTH) program in the districts of Rambipuji, Kaliwates, and Ledokombo in 2024. The population of SOTH program participants is 500 people. The research sample was taken using the cluster sampling technique, which is a sampling method that divides the population into regional groups (per district/area) and then selects representatives from each group, with a calculation of 10-30% of the population. Cluster sampling was conducted using the one-stage cluster sampling method, where all clusters were randomly selected to be the sample.

4. Instruments and Data Collection Tools

The data collection techniques used for preliminary research and research implementation include 1) participant observation, 2) interviews, 3) documentation studies, and 4) questionnaires. The observer conducts participant observation by involving themselves in an activity being carried out or experienced by others, while the others are unaware that they are being observed.

1. Observations. The observation activities were conducted to observe various phenomena during the Great Parents School (SOTH) program. These activities are multi-collaborative observations carried out during the SOTH activities
2. Interviews. The interview was conducted with policymakers about the research focus, specifically BKKBN, DPA₃KB, BKB Cadres, PKK Team, Villages, Sub-districts, and Health Medical Team.
3. Documentation Study. This activity aims to store/collect data or written documents related to implementing the green skills training that has been conducted. Data is obtained through the review and interpretation of documents and can be used as a data source for researchers.
4. Questionnaire. The questionnaire is used on a large sample, with cluster sampling. This sampling method divides the population into regional groups (per sub-district/area) and selects representatives from each group.
5. The Focus Group Discussion (FGD) aims to unify the perceptions of BKKBN, DPA₃KB, BKB Cadres, PKK Team, Villages, Sub-districts, and Health Medical Teams regarding specific issues, topics or interests in the formulation of a Penta helix education model to strengthen specific and sensitive intervention services for the stunting prevention program in Jember Regency, with the hope of achieving agreement and new understanding related to the issues discussed.

5. Research Flow

The formulation of the Pentahelix to be implemented in this research is a concrete development of an initial concept. This development is formulated through thinking activities and the simultaneous development of similar existing models. In the context of community education, this model answers the needs and problems occurring in the community, particularly those related to implementing community education learning programs. The design of this research is as follows:

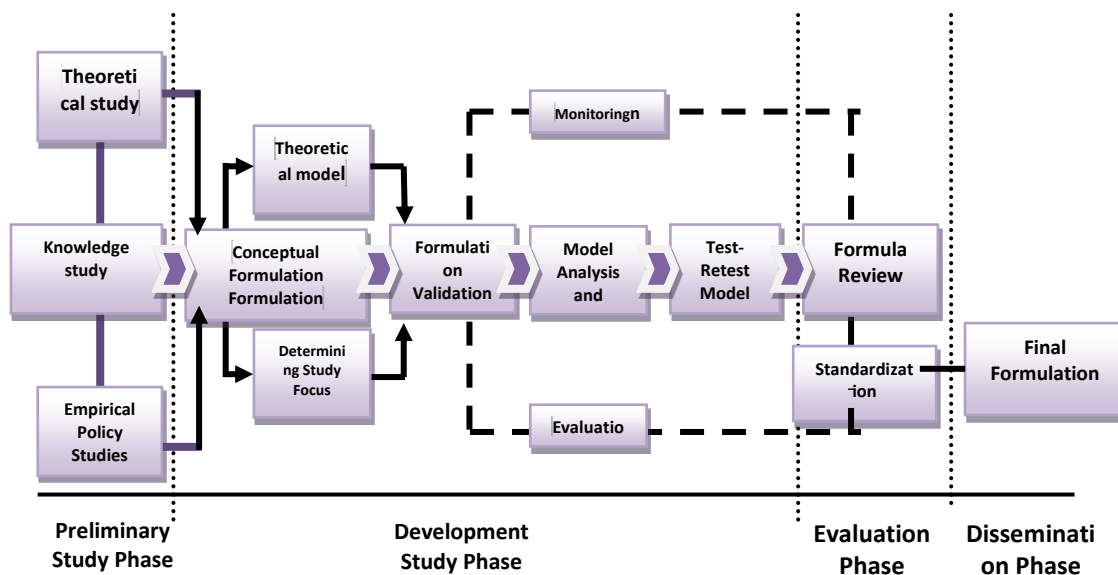


Chart 1. Research Flow

RESULT AND DISCUSSION

1. Profile of Areas Affected by Stunting

Kaliwates District is part of Jember Regency, located 8 km west of the government center, covering an area of 24.94 km with an elevation of 110 meters above sea level and divided into seven sub-districts, namely Mangli, Kebon Agung, Kaliwates, Kepatihan, Tegal Besar, Sempusari, and Jember Kidul, with a total of 33 hamlets, 172 neighborhood associations (RW), and 594 community units (RT). The largest area is the Tegal Besar sub-district, covering 30.55% of the area of the Kaliwates sub-district. Based on data from the Jember Regency Population Office, the population in Kaliwates District is 126,473 people, with 62,417 males and 64,056 females. In terms of social and welfare aspects, Kaliwates District is one of the areas that has complete facilities, including four hospitals, three community health centers, 14 polyclinics, and five auxiliary community health centers. In addition, educational facilities are also available in the form of 56 Kindergarten units, 10 Raudhatul Athfal units, 40 Elementary School units, 7 Madrasah Ibtidaiyah units, 20 Junior High School units, 6 Madrasah Tsanawiyah units, 10 Senior High School units, 3 Vocational High School units, and 5 Madrasah Aliyah units.

Ledokombo District is part of Jember Regency, located 20 km south of the government center, covering an area of 157.1 km² with an elevation of 370 meters above sea level and divided into ten villages, namely Suren, Sumber Salak, Sumber Bulus, Sumber Lesung, Lembongan, Sumber Anget, Ledokombo, Slateng, Sukogidri, and Karang Paiton, with 38 hamlets, 145 neighborhood associations (RW), and 424 community units (RT). The largest area is the village of Sumber Salak, which accounts for 68% of the area of the Ledokombo sub-district. Based on data from the Jember Regency Population Office, the population in the Ledokombo District is 69,789 people, with 34,516 males and 35,273 females. From the social and welfare aspect, Ledokombo District has the availability of health facilities in the form of 1 community health center, two polyclinics, and five auxiliary community health centers. In addition, there are educational facilities such as 20 units of Kindergarten (TK), 24 units of Raudhatul Athfal (RA), 35 units of Elementary School (SD), 10 units of Madrasah Ibtidaiyah (MI), eight units of Junior High School (SMP), and five units of Madrasah Aliyah (MA).

Rambipuji is a district in Jember Regency, East Java Province, Indonesia. Rambipuji is located in the western part of Jember Regency; to the west, it borders Bangsalsari District; to the north, it borders Panti District; and to the south, it borders Balung District. The residents of Rambipuji consist of various ethnic groups, namely Javanese, Madurese, and Chinese.

However, most residents speak Madurese even though they are not. Most residents are Muslim, with a small minority being Christian and Confucian. Rambipuji District is still cool and lush because there are still many green areas and very few industrial zones. Rambipuji District has an area of approximately 55.5 km² and is situated at an altitude of approximately 90 meters above sea level. The Rambipuji District consists of 8 villages, namely Curah Malang Village, Nogosari Village, Pecoro Village, Rowotamtu Village, Rambipuji Village, Kaliwining Village, Rambigundam Village, and Gugut Village. The largest villages are Nogosari Village and Kaliwining Village. The largest village is Nogosari Village, with a percentage of 28.5% of the total area of Rambipuji District. The smallest village is Gugut Village, with a percentage of 5.1% of the total area of Rambipuji District.

Based on the 2023 Indonesian Health Survey (IHS), the Jember Regency Government is among the 20 regencies and cities that successfully reduced the prevalence of stunting from 34.9 percent to 29.7 percent. This decrease places Jember in the fourth position for the highest stunting prevalence after holding the first position in 2022.

The Role of ABCGM Institutions in the Pentahelix Partnership for Handling Stunting

- 1) Academic Sector: Academic Community: Playing a role in conducting research, providing data and innovative solutions, offering education and training, and collaborating across sectors to support science-based policies and initiatives.
- 2) Business Sector: CSR provides funds, facilities, or other resources to support project initiatives.
- 3) Community Sector: PKK Team, BKB Cadres (Toddler Family Development), SOTH Participants Collect data on stunting intervention targets, facilitate the implementation of integrated stunting intervention at the village level, and implement/facilitate the stunting intervention program (SOTH).
- 4) Media Sector: KOMINFO Plays a role in publishing stunting intervention activities and updating data.
- 5) Government Sector: DP3AKB, Ledokombo, Rambipuji, Kaliwates Subdistricts, Medical Team Act as coordinators for the acceleration of stunting reduction in the field and monitor stunting conditions at the village level, as well as plan and implement data-based programs and assist in the implementation of BKB and SOTH programs.

2.Data Results on the Role of ABCGM Institutions in the Pentahelix Partnership for Stunting Program Management

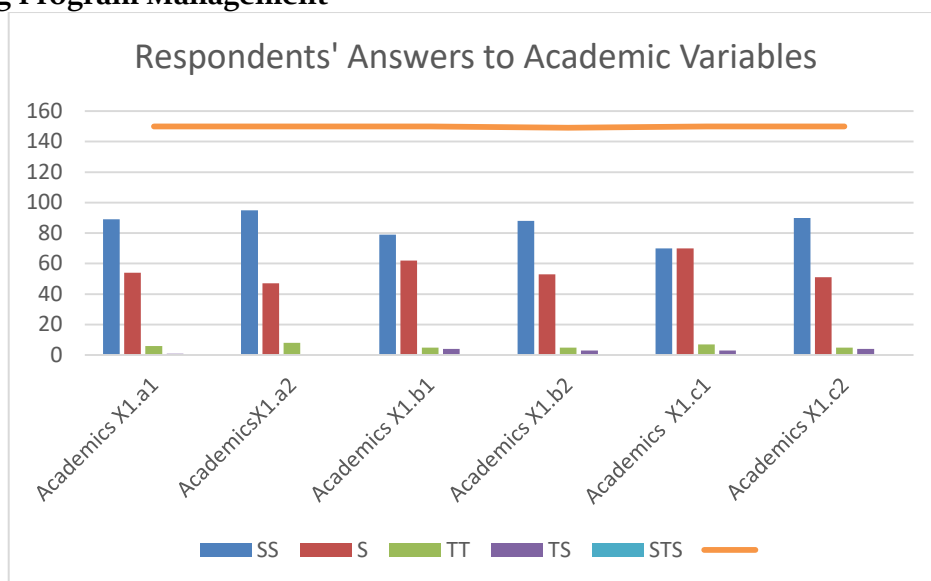


Figure 4. Descriptive Data Results of the Academic Variable

Based on the table above, the role performed by academics is very good, as evidenced by the respondents' answers from the image above. Respondents assess that university academics are innovating research development related to nutritious supplementary foods that are easily accessible to the community in addressing stunting. The answer "strongly agree" reached 95 respondents who agreed with it, which means the statement reflects the community's expectations regarding the role of higher education academics in developing innovations that can address the issue of stunting through research on nutritious supplementary foods that are easily accessible in the surrounding environment.

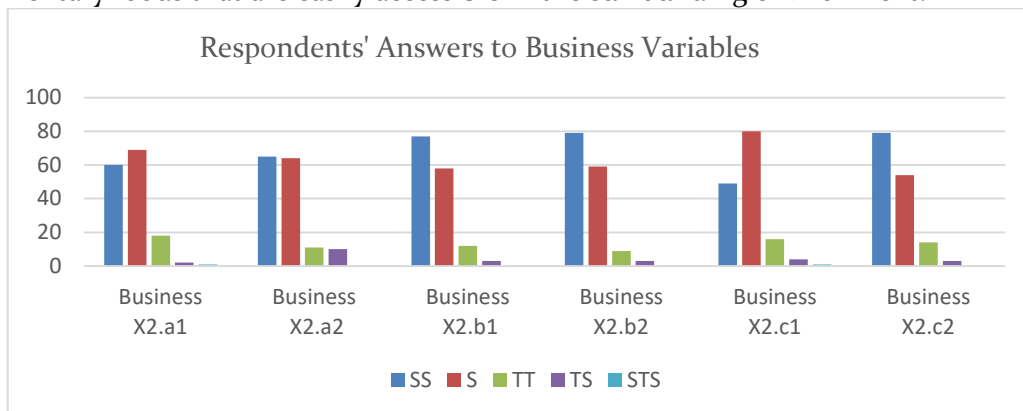


Figure 5. Descriptive Data Results of Business Variables

Based on the table above, the role performed by the Company/Business Actors is very good, as evidenced by the respondents' answers from the above image 5. Respondents believe that business actors/CSR greatly help by assisting such as basic food packages, as seen in the statement "The company supports health programs by providing financial aid to posyandu and the community in handling stunting." and "The company helps provide access to clean water, nutritious food, and healthy living patterns involving the community and village officials in handling stunting." Respondents rated it very good, as evidenced by several actions taken by business actors, such as the assistance provided by PT. KAI in Rambipuji District in January 2024 with basic food packages. This was also done by MORA Group in September 2024, assisting 62 stunted toddlers.

The aid distributed included 1,240 eggs, 186 boxes of powdered milk, and 124 jars of Neo Algae supplements. Each toddler received 20 eggs, three boxes of powdered milk, and one jar of supplements to support their nutrition during growth. In the same month, PT Perkebunan Nusantara I (PTPN I) Regional 5 allocated IDR 30 million for Social and Environmental Responsibility (TJSL) to address stunting in the Jember Regency. This stunting acceleration assistance will be distributed directly through Posyandu cadres, accompanied by the Puskesmas, as Supplementary Feeding (PMT). The PMT is ensured to be nutritionally balanced according to nutritionist recommendations.

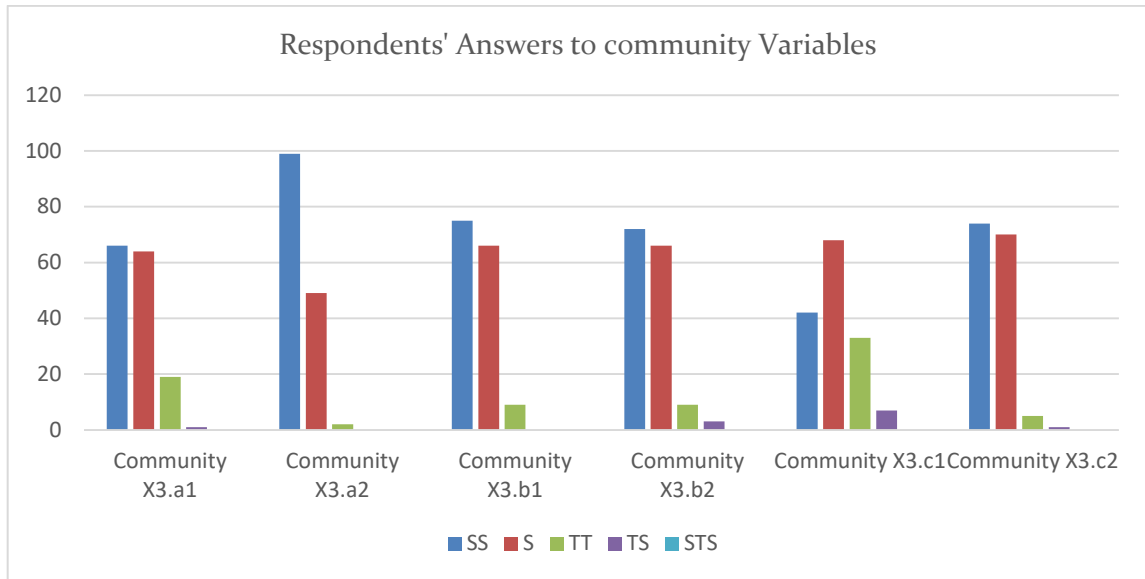


Figure 6. Descriptive Data Results of the Community Variable

Based on the table above, the role performed by academics is very good, as evidenced by the respondents' answers from the image above. Respondents believe that the PKK Team, BKB Cadres (Toddler Family Development), and their participation in SOTH have been very helpful to the community in addressing stunting. Respondents showed a positive assessment, with the majority giving answers of Strongly Agree (SA) and Agree (A), indicating that the program is effective in helping the community.

Each community, such as X3.a1, X3.a2, X3.b1, X3.b2, X3.c1, and X3.c2, even though some rated Disagree (D) and Strongly Disagree (SD), their numbers are relatively small. This shows that the role of the PKK team and BKB Cadres in supporting this program is also perceived as beneficial by the community, especially in efforts to address stunting in society. Thus, the SOTH program has had a significant impact and is recognized by those communities as an effective solution for addressing the issue of stunting.

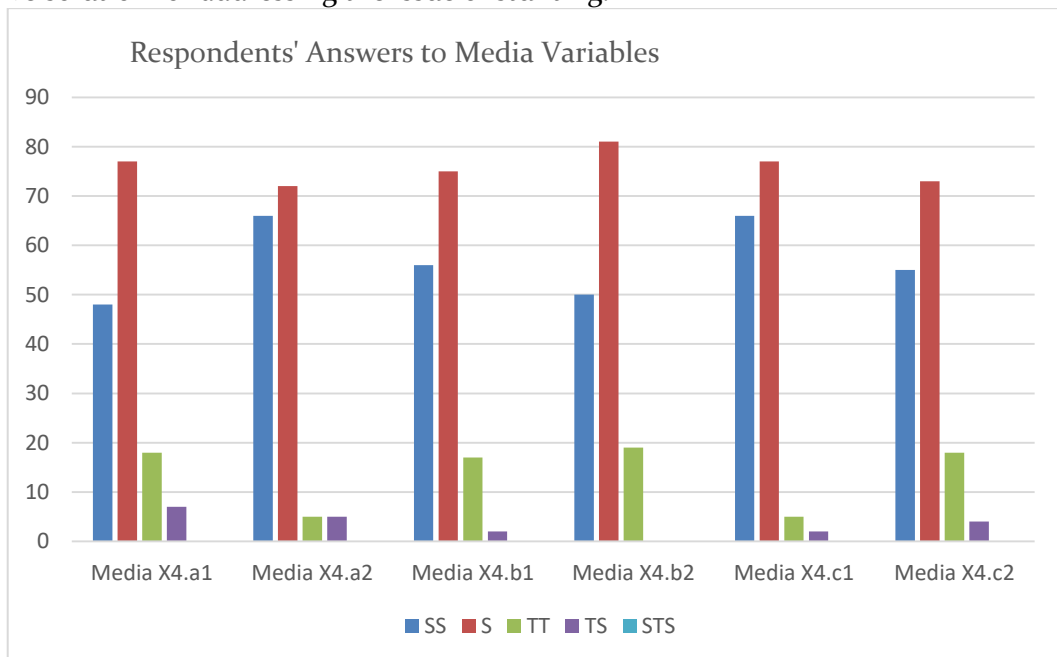


Figure 7. Descriptive Data Results of the Media Variable

Based on the diagram above, the role of the media in disseminating information related to stunting prevention is considered quite significant by the respondents. The information disseminated by the media has been well-received and has positively impacted public awareness about the importance of stunting prevention.

Additionally, the media plays a crucial role in publicizing various stunting reduction intervention activities carried out in the community, including providing access to the latest data related to the conditions and developments of stunting handling efforts. This informs the public and enables broader collaboration to address the stunting issue. Although some respondents rated Disagree (D) or Strongly Disagree (SD), their numbers were relatively small compared to those who agreed, further reinforcing that the media has been performing well in publication and education on stunting prevention efforts.

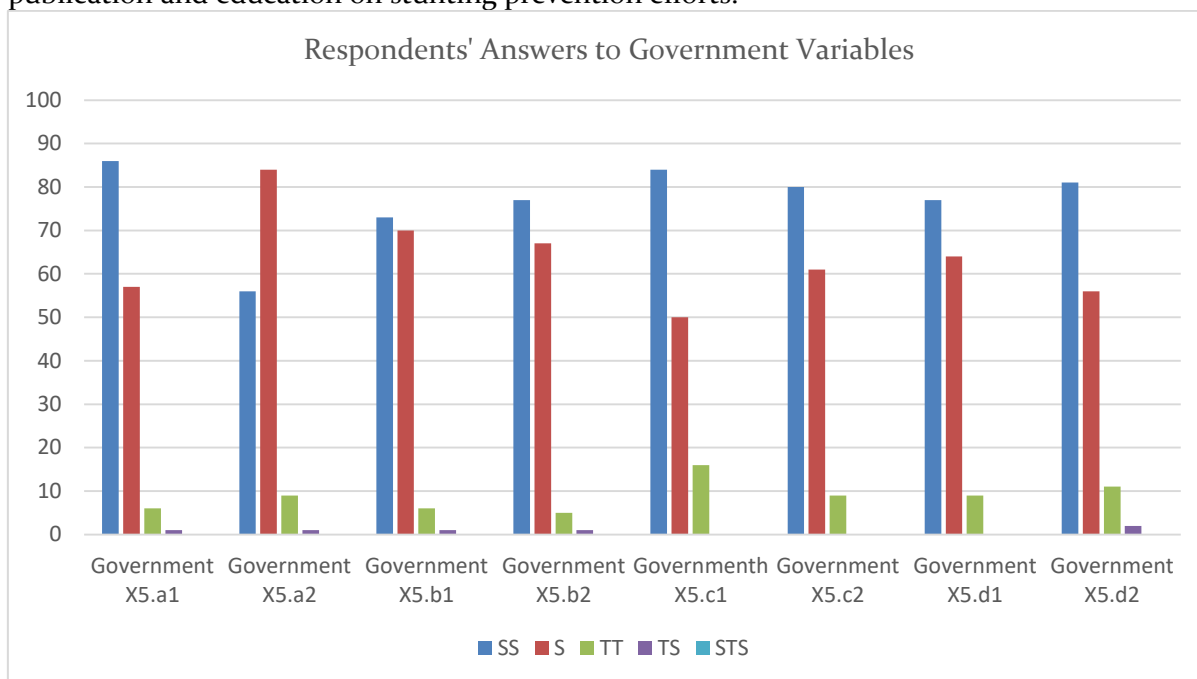


Figure 8. Descriptive Data Results of the Government Variable

Based on the diagram above, it is evident that the government plays a very significant role in accelerating the reduction of stunting in the field. Respondents from various groups positively assessed the government's role in those efforts. This assessment shows that the government is seen as effective in coordinating the implementation of various stunting reduction acceleration programs at the village level.

In addition, the government also plays an important role in regularly monitoring stunting conditions in the field, especially at the village level, and ensuring the planning and implementation of stunting reduction programs based on accurate data. As a companion in implementing the Toddler Family Development Program (BKB) and the Great Parent School (SOTH), the government also directly supports the community in carrying out these programs. Although a few respondents rated Disagree (D) and Strongly Disagree (SD), their numbers were very small, reinforcing that the government has performed well in coordinating and supervising the implementation of the stunting program effectively.

3. Formulation of Pentahelix Education in Strengthening Specific and Sensitive Intervention Services for the Stunting Reduction Program in Jember Regency

Stunting is a global health issue of particular concern in developing countries like Indonesia. The impact is not only limited to the physical growth of children but also their cognitive development, future productivity, and the quality of human resources. Data from the Ministry of Health shows that the prevalence of stunting in Indonesia still exceeds the WHO

threshold, thus requiring comprehensive intervention. The Pentahelix approach presents itself as a collaborative solution involving five main elements: government, academics, business actors, the community, and the media. This collaboration aims to raise public awareness about stunting prevention, improve parenting patterns, and enhance access to quality health and nutrition services. This approach focuses on the active participation of all parties by integrating government policies, academic innovations, CSR contributions from businesses, community advocacy, and media support. With this method, it is hoped that there will be a significant behavioral change in society to reduce the prevalence of stunting sustainably.

The respondents' answers very well prove the role of academics. Respondents believe that university academics have innovated in developing research related to nutritious supplementary food that is easily accessible to the community in tackling stunting. The response "strongly agree" was given by 95 respondents, indicating that this statement reflects the community's expectations regarding the role of university academics in developing innovations that can address the stunting issue through research on nutritious supplementary food that is easily obtainable in the surrounding environment.

The role of the company/business actors is very good. Respondents believe that business actors/CSR have greatly assisted in providing aid such as basic food packages, so in the statement "The company supports health programs by providing financial assistance to posyandu and the community in addressing stunting." and "The company helps provide access to clean water, nutritious food, and healthy living patterns involving the community and village officials in addressing stunting." Respondents rated it very well, as evidenced by several actions taken by the business actors, such as PT. KAI in Rambipuji District in January 2024 providing food aid. MORA Group also did this in September 2024 by assisting 62 outstanding toddlers. The assistance includes 1,240 eggs, 186 boxes of powdered milk, and 124 jars of Neo Algae supplements. Each toddler receives 20 eggs, three boxes of powdered milk, and one jar of supplements to support their nutrition during growth. In the same month, PT Perkebunan Nusantara I (PTPN I) Regional 5 allocated IDR 30 million for Social and Environmental Responsibility (TJSL) to address stunting in the Jember Regency. This stunting acceleration assistance will be directly channeled through Posyandu cadres, accompanied directly by the Puskesmas in the form of Supplementary Feeding (PMT). The PMT is guaranteed to be nutritionally balanced according to the recommendations of nutrition experts.

The formulation of Pentahelix-based education has several strategic objectives. First, raise public awareness about the dangers of stunting through education on nutritious diets, maternal care, and parenting practices that support child growth. Second, cross-sector collaboration should be encouraged to strengthen the alliance between government elements, academics, business actors, communities, and the media so that each sector can contribute maximally. Third, optimizing equitable access to information and health services for the community, especially in areas vulnerable to stunting. Fourth, positive behavioral changes in the community should be encouraged regarding exclusive breastfeeding, consumption of nutritious food, and good sanitation. Fifth, government policies should be strengthened by providing evidence-based input to make stunting reduction programs more effective. Finally, an evaluation framework should be provided to measure the effectiveness of educational interventions so that the program can continue to be improved and sustained. With the achievement of these goals, this formulation is expected to reduce the stunting rate and improve the overall quality of life for Indonesian children.

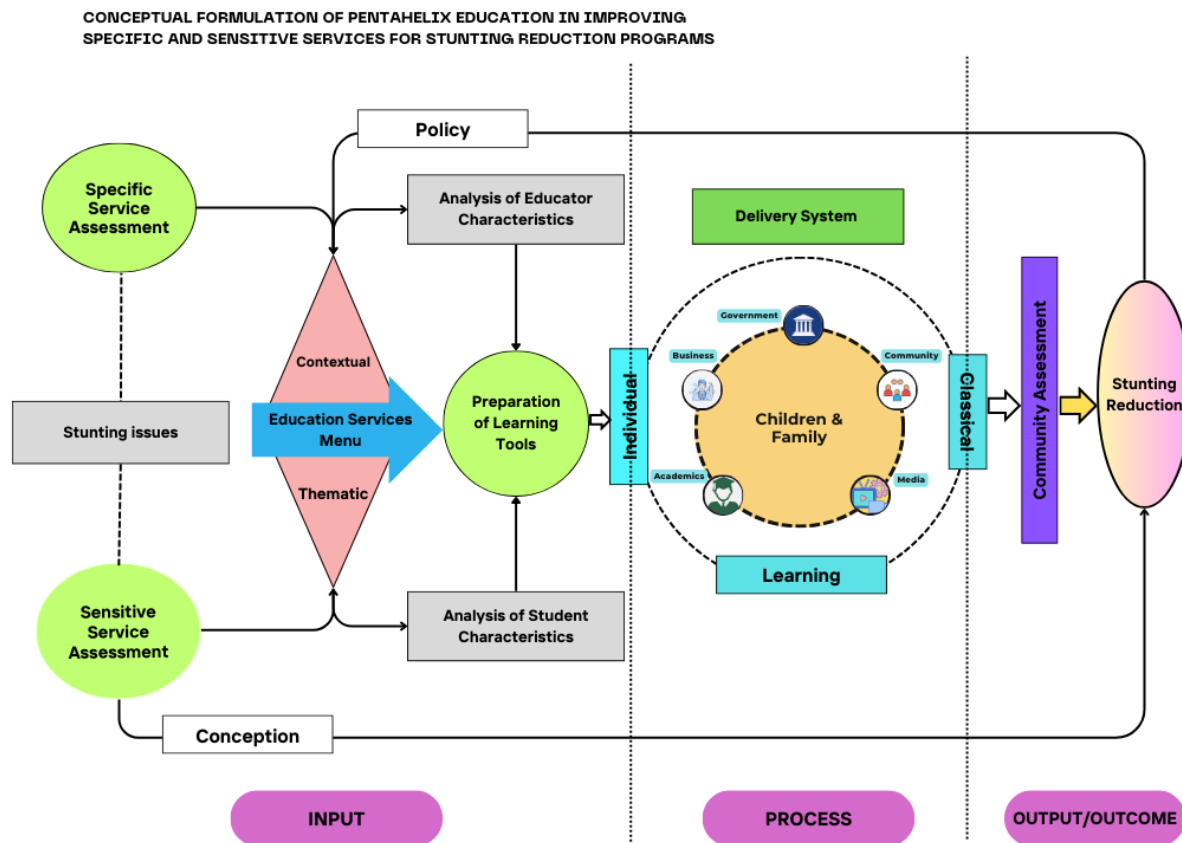


Figure 9. Conceptual Formulation of Pentahelix Education

The development of the Pentahelix formulation begins with the planning of the learning program. The first step is to conduct a specific and sensitive service assessment to identify the need for direct interventions such as nutrition and health provision and supporting interventions such as sanitation and education. From this assessment, key issues causing stunting were also identified, such as chronic malnutrition, poor sanitation, and suboptimal parenting practices. The assessment results are used to develop an educational service menu based on local context and community needs. A situational analysis and understanding of the local context are also conducted to identify challenges in specific areas by involving stakeholders from the five elements of the Pentahelix. This process includes evidence-based data collection, identifying target groups such as pregnant women or families, and developing relevant learning materials such as modules, interactive media, and practical guides.

In implementing the learning program, the Pentahelix approach uses various educational channels, such as direct training, digital media, counseling at posyandu, and community activities. The five elements of the Pentahelix play an important role in this alliance. The government acts as a director and facilitator, making policies, providing infrastructure, and integrating across sectors. Academics provide evidence-based research, develop curriculum, and train healthcare professionals. Business actors support through CSR, nutritional product innovation, and digital technology. The community becomes the spearhead of advocacy, especially in remote areas, and activates posyandu as centers of

education. Meanwhile, the media plays a role in disseminating information through campaigns, social media, and positive reporting to build supportive public opinion.

The final component is the alliance among the Pentahelix elements. Evidence-based policy collaboration is produced through the cooperation of the government and academics, while the media and community deliver direct education using materials prepared by academics. Business actors help ensure sustainable access by providing infrastructure or supporting products. Academics and the government monitor and evaluate the program's effectiveness for future policy improvements.

The results of the Pentahelix-based learning program begin with a community assessment, which is an evaluation process to understand the community's needs and the program's effectiveness. This assessment includes identifying community needs related to access to health services, sanitation, and parenting patterns; monitoring the implementation of intervention programs; and evaluating the program's impact on health indicators such as stunting prevalence and the community's understanding of nutrition. This process also involves empowering the community to be active in implementing and evaluating the program.

The main impact of this program is the reduction in the prevalence of stunting through specific interventions such as the provision of nutritious food, growth monitoring, and immunization, as well as sensitive interventions such as access to clean water, healthy lifestyle campaigns, and poverty alleviation. The education provided creates positive behavioral changes in the community, such as awareness of the importance of exclusive breastfeeding and nutritious complementary feeding. The results of this intervention include improved family welfare, better access to services, and community empowerment to address the issue of stunting independently. The community assessment process ensures that the program is relevant to local needs, while data evaluation serves as the basis for program improvement.

CONCLUSION

Based on the data analysis results, it is evident that the roles of the five elements, namely Academia, Business, Community, Media, and Government, are visible. Collaborating well, but ifranked, the community sector's role needs to be enhanced. The Pentahelix formulation development research results began with planning the learning program. The first step is to conduct an assessment of specific and sensitive services. The assessment results create an educational service menu based on local context and community needs. The final component is the alliance among the Pentahelix elements. Evidence-based policy collaboration is produced from the cooperation between the government and academics, while the media and community deliver direct education using academic materials. Business actors help ensure sustainable access by providing infrastructure or supporting products. Academics and the government monitor and evaluate the program's effectiveness for future policy improvements. The results of the Pentahelix-based learning program begin with a community assessment, which is an evaluation process to understand the community's needs and the program's effectiveness.

Furthermore, the success of a Pentahelix-based learning program is highly dependent on the synergy between elements in the development of adaptive strategies. Academics play a role in providing research-based data to ensure that policies implemented are in accordance with community needs. This data is the basis for the government in formulating more effective and targeted policies. Community involvement at this stage is very important so that the policies formulated reflect the aspirations and conditions of the community in real terms.

In the implementation of the program, the business sector provides significant contributions in providing support in the form of technology, services, or products that support the implementation of activities. This cooperation can be in the form of providing medical devices, information technology, or financial assistance that strengthens educational

infrastructure. Meanwhile, the media serves as an effective communication channel in disseminating information about the program, increasing public awareness, and building active participation.

Program evaluations are conducted periodically to ensure the sustainability and effectiveness of the policies implemented. Academics and government work together to collect data, analyze the impact of the program, and provide recommendations for improvement. Communities are also involved in the evaluation process through feedback mechanisms to determine public perceptions of the services provided. The results of this evaluation become material for the development of more innovative and responsive policies in the future.

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