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RESEARCH ARTICLE

Strategic Analysis of the Nutrition Action Movement to Address Anaemia Among Adolescent Girls

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ABSTRACT

Introduction: Adolescent girls are an important population for promoting a healthy, stunting-free generation; however, they continue to experience substantial nutritional problems, particularly anaemia. The prevalence of anaemia among adolescent girls in Indonesia remains high, and in West Lombok Regency, 58% of adolescent girls are affected. In response, the Indonesian government has implemented the Nutrition Action Movement since 2018 with multisectoral involvement. However, the proportion of adolescent girls with anaemia remains high, suggesting persistent implementation challenges. This study aimed to conduct a stakeholder-based strategic assessment of the internal and external conditions affecting implementation of the Nutrition Action Movement in West Lombok Regency.

Methods: This study used a qualitative descriptive design with a cross-sectional approach based on in-depth interviews with key stakeholders involved in the Nutrition Action Movement in West Lombok Regency. Informants were purposively selected from health offices, schools, and related sectors. The Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices were used to analyse the data and identify strategic strengths, weaknesses, opportunities, and threats affecting programme implementation.

Results: The strategic assessment placed the Nutrition Action Movement in Cell VIII of the Internal–External Matrix (IFE score = 2.22; EFE score = 1.65).

Conclusion: The findings highlighted key priorities for programme strengthening, including structured monitoring and evaluation, more consistent school-level implementation, and nutrition training for teachers, alongside external challenges such as community perceptions and geographical disparities. Defensive and adaptive implementation strategies included developing standardised school operating procedures, strengthening teacher capacity, using digital monitoring platforms, and reinforcing multisectoral partnerships.

Keywords: Adolescent Girls; Anaemia; Nutrition Action Movement; Strategic Analysis; Qualitative Study

INTRODUCTION

Adolescent girls are a key population in global nutrition and public health because their nutritional status has direct intergenerational consequences (1). Among adolescent girls in Bogor, low iron and vitamin C intake and poor adherence to iron supplementation have been associated with anaemia (2). The World Health Organization identifies anaemia as one of the most common nutritional deficiencies worldwide, particularly among adolescent girls in low- and middle-income countries (LMICs) (3). Focusing on adolescent nutrition is critical to breaking the intergenerational cycle of malnutrition and achieving the Sustainable Development Goals (SDGs) (4), as emphasised in recent global analyses.

National survey data have documented a substantial burden of anaemia among adolescents in Indonesia (5). National and provincial data indicate high prevalence in some areas, including West Nusa Tenggara. Local data further indicate that anaemia prevalence among adolescent girls in West Lombok Regency exceeds 58%, representing a serious public health problem (6). This burden reflects not only low iron intake but also structural and behavioural factors, including poor adherence to supplementation, limited health literacy, and suboptimal programme implementation (7,8).

The Government of Indonesia has initiated iron supplementation programmes and established the Nutrition Action Movement as a national nutrition strategy for adolescents to address anaemia and its consequences. The programme uses a multisectoral, school-based approach that combines health promotion, iron supplementation, and stakeholder collaboration (9). Global evidence indicates that schools are among the most effective platforms for delivering nutrition interventions to adolescents because they can support consistent delivery and structured behavioural interventions (10). International literature also indicates that implementation quality, monitoring systems, and community engagement are important determinants of programme effectiveness (11).

Despite these efforts, persistently high anaemia prevalence indicates a substantial gap between policy intentions and programme outcomes. Strategic analyses of Indonesian public-health programmes have used IFE–EFE matrices to examine internal and external factors affecting programme implementation, including stunting-reduction programmes (12). Consequently, there is limited understanding of how organisational capacity, stakeholder coordination, resource availability, monitoring mechanisms, and policy and community support interact to influence the implementation and effectiveness of local anaemia prevention programmes. This limitation makes it difficult to explain why programmes supported by national and local policies may still experience implementation gaps and suboptimal outcomes in specific contexts (13). To address this gap, this study examines the internal and external factors influencing the implementation of local public health nutrition programmes. The Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) frameworks provide structured tools for assessing programme strengths and weaknesses alongside external opportunities and threats. Rather than constituting the primary novelty of the study, these frameworks provide a structured approach to integrating organisational and environmental evidence into a programme-level strategic assessment. This approach can help identify priorities for programme improvement, stakeholder coordination, resource allocation, sustainability, and scalability, thereby providing actionable insights to strengthen local anaemia prevention.

Recent global health research increasingly applies systems thinking, recognising that the success of nutrition interventions depends on complex interactions among institutional capacity, governance, sociocultural context, and environmental factors. Internationally, WHO and other organisations recommend multifaceted approaches tailored to specific contexts. However, evidence from adolescent nutrition programmes in developing-country settings remains limited regarding how organisational, institutional, and environmental factors interact to influence local programme implementation and outcomes. This limitation is particularly relevant to anaemia prevention, for which programme effectiveness depends not only on intervention coverage and individual adherence but also on sustained coordination, implementation capacity, monitoring, and support from multiple stakeholders. Strategic management frameworks, including SWOT-based approaches and the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices, provide structured tools for integrating these dimensions and identifying programme-level strategic priorities. In this study, these frameworks are used not as the primary novelty but as analytical tools to generate a context-specific understanding of factors shaping anaemia prevention programme implementation and to inform actionable strategies for programme improvement (14).

Therefore, this study aimed to conduct a stakeholder-based strategic assessment of the internal and external factors influencing implementation of the Nutrition Action Movement using the IFE and EFE frameworks. By identifying key strengths, weaknesses, opportunities, and threats from stakeholder perspectives, the study sought to identify strategic priorities for local programme strengthening, coordination, and sustainability, without evaluating biological outcomes or intervention effectiveness.

METHODS

This study employed a qualitative descriptive design with a cross-sectional approach to explore internal and external factors influencing implementation of the Nutrition Action Movement programme in West Lombok Regency. A qualitative descriptive approach was considered appropriate for obtaining comprehensive insights from stakeholders regarding programme implementation, institutional support, barriers, and opportunities.

Study Design

This study employed a qualitative descriptive approach with a cross-sectional design to analyse the internal and external factors influencing implementation of the Nutrition Action Movement programme. The qualitative approach was selected to

obtain an in-depth understanding of stakeholders' perspectives on programme strengths, weaknesses, opportunities, and threats through application of the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) frameworks. The study was conducted from June to December 2025.

Participants and Sampling

The study participants were stakeholders involved in planning, implementing, and evaluating the Nutrition Action Movement programme in West Lombok Regency. Purposive sampling was used to select informants with relevant experience and knowledge of the programme. The final sample comprised 11 key informants: three representatives from the District Health Office; two from the District Education Office; three representatives from distinct Community Health Centres (*Puskesmas*), covering two rural subdistricts and one urban subdistrict; one representative from the District Ministry of Religious Affairs; and two school representatives. These stakeholders were selected because they were directly involved in the programme and were considered well informed about implementation in their respective contexts. Operationally, Community Health Centres and schools were purposively selected to represent urban and rural catchment areas characterised by high reported anaemia prevalence and active programme implementation. Inclusion criteria were active involvement in the programme and willingness to participate in an in-depth interview. There were no refusals or withdrawals. The sample size was determined to ensure representation of the main stakeholder groups. Accordingly, sample adequacy was guided by predetermined stakeholder representation across key administrative sectors. Data saturation was not used as a stopping criterion. Adolescent girls, parents, and community-based partners were not included; therefore, community-level findings reflect stakeholder perceptions rather than direct community perspectives. Following the IFE–EFE analysis, an expert consultation was conducted to contextualise the findings and formulate strategic alternatives. The expert panel comprised four senior specialists from the West Nusa Tenggara Provincial Stunting Task Force: one public health specialist/epidemiologist, one community nutrition expert, one provincial nutrition programme coordinator, and one school-health policy analyst. None of the experts overlapped with the 11 district-level interview informants or the research team. The consultation was conducted as a structured 90-minute panel session. The research team presented the identified strategic factors, after which the experts deliberated on actionable interventions to address priority internal weaknesses and external threats. Deliberations were documented using verbatim field notes and official session minutes by two research assistants. These inputs were subsequently synthesised by the research team using the TOWS matrix framework to construct alternative strategies.

Setting

This study was conducted in West Lombok Regency, West Nusa Tenggara Province, Indonesia. The location was purposively selected because of the high prevalence of anaemia among adolescent girls and the active implementation of the Nutrition Action Movement programme in the region. The study included both urban and rural school settings to capture diverse implementation contexts.

Data Collection Instruments

Data were collected using semi-structured interview guides developed on the basis of the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) frameworks, which were validated by nutrition and public health experts and piloted to ensure clarity and flow. Interviews were conducted by trained research assistants with a bachelor's degree in Nutrition and prior experience in qualitative health research. The interviewers had no prior personal relationship with the participants. Individual interviews were conducted in a quiet setting with only the interviewer and participant present to ensure confidentiality. No repeat interviews were conducted; each participant completed a single session. All interviews were audio-recorded with participants' consent and supported by field notes. Recordings were transcribed verbatim and verified against the audio files for accuracy and completeness. Participants were invited to review interview summaries for member checking. Qualitative data were organised, coded, and analysed using NVivo version 12 software following a combined deductive–inductive thematic approach: initial deductive coding applied predefined IFE/EFE matrix categories, while inductive open coding allowed unexpected contextual barriers and nuances to emerge. To manage data-generation bias, the researchers acknowledged their academic positions in public health nutrition and used reflexive bracketing (epoché) and peer debriefing during analysis.

Data Collection Procedures

Primary data were collected through face-to-face in-depth interviews with selected informants. Secondary data were obtained from programme reports, policy documents, and official guidelines related to the Nutrition Action Movement programme. Interviews were conducted after informed consent had been obtained and were documented using audio recordings and field notes. To enhance data credibility and trustworthiness, triangulation was performed through interviews, direct observation, and document review. In-depth interviews were conducted face-to-face between June and December 2025. Each interview lasted approximately 30–60 minutes, depending on the informant's responses and availability. Interviews were conducted in Bahasa Indonesia to enable participants to express their perspectives comfortably and clearly.

Coding and Data Analysis

All interview recordings were transcribed verbatim and checked against the original audio recordings for accuracy. The research team then analysed the transcripts, extracted salient quotations, and assigned initial codes for programme implementation barriers, enablers, and contextual factors. Codes were compared and grouped into broader categories, which

were subsequently refined into candidate internal and external strategic factors. Internal factors were classified as strengths or weaknesses, while external factors were classified as opportunities or threats. The research team reviewed the coding and factor development, and disagreements were resolved through discussion and consensus. The final factors were analysed using the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices. Each factor was assigned a weight from 0.00 to 1.00, with weights within each matrix summing to 1.00. IFE ratings represented the magnitude of internal factors (1 = major weakness, 2 = minor weakness, 3 = minor strength, and 4 = major strength), whereas EFE ratings represented the programme's response to external factors (1 = poor response, 2 = average response, 3 = above-average response, and 4 = superior response), regardless of whether the factor was an opportunity or a threat. Weighting and rating were conducted with selected stakeholders, specifically the West Nusa Tenggara Provincial Stunting Task Force Expert Team (n = 4), and the research team (n = 4) through consensus-based discussion. This followed an initial independent assessment using structured scoring sheets, in which individual weights were averaged and mathematically normalised to sum to 1.00; rating discrepancies were then deliberated on the basis of field evidence until final agreement was reached. Final weighted scores were calculated by multiplying each factor's weight by its rating, and the total IFE and EFE scores were used to determine the programme's position in the Internal–External (IE) Matrix. The resulting strategic position was interpreted alongside the qualitative findings to develop strategic recommendations.

Ethical Considerations

This study received ethical approval from the Health Research Ethics Committee of the Faculty of Medicine, University of Mataram, with approval number 052/UN18.F8/ETIK/2025. All participants provided written informed consent before participation after receiving a complete explanation of the study objectives and procedures.

Trustworthiness

Several strategies were used to enhance the trustworthiness of the findings. Data triangulation involved comparing semi-structured interviews with direct observations of programme implementation, nutrition education and monitoring activities, programme reports, attendance records, and programme monitoring records. Discrepancies were re-examined and discussed within the research team and clarified with relevant participants. Member checking involved presenting interview summaries to some participants; relevant feedback was incorporated into the study. Regular peer discussions during coding and interpretation helped reduce individual researcher bias and strengthen credibility.

Reflexivity

The researchers maintained reflexivity throughout the study by acknowledging their roles and potential biases during data collection and analysis. Regular discussions within the research team were conducted to reflect on interpretations and maintain analytical neutrality.

Protection of Participant Identity

Participant confidentiality and anonymity were maintained throughout the study. Personal identifiers were removed from transcripts and replaced with participant codes. All data were stored securely and were accessible only to the research team. Findings are presented in aggregate form to prevent identification of individual participants.

RESULTS

Qualitative Evidence Underlying the Strategic Factors

The qualitative analysis identified a range of internal and external conditions shaping implementation of the Nutrition Action Movement. Stakeholders generally described cross-sector coordination between the District Health Office and Community Health Centres as an important implementation strength.

One stakeholder explained, "We always coordinate with the District Health Office regarding the schedule for iron supplementation distribution and the implementation of the Nutrition Action programme in schools."

The school-based and participatory approach involving teachers, students, and health workers was also perceived as facilitating programme delivery. As one informant noted, "*Kegiatan ini melibatkan guru, UKS, siswa, dan petugas puskesmas sehingga pelaksanaannya lebih mudah*" ("The activity involves teachers, the school health unit, students, and health-centre staff, making implementation easier"). In addition, the availability of responsible health personnel, iron supplementation procurement mechanisms, and equipment for assessing anaemia were identified as supporting conditions.

However, stakeholders also identified implementation constraints, including reliance on the District Health Office, uneven implementation across schools, limited nutrition competencies among teachers, the lack of a structured monitoring and evaluation system, and logistical and funding constraints. One stakeholder described variation in implementation of minum TTD because "*jadwal sekolah berbeda-beda*" ("school schedules differ"). Another informant reported, "*Belum ada sistem monitoring yang terstruktur sehingga capaian program sulit dievaluasi*" ("There is no structured monitoring system, making it difficult to evaluate programme achievements"). These concerns suggest that programme structures are not implemented consistently across schools.

Regarding the external environment, stakeholders identified national policy support as an opportunity to sustain the Nutrition Action Movement. Opportunities associated with the CERIA digital platform and potential partnerships with the private sector and community organisations were also identified, but these were considered underdeveloped. One stakeholder commented, "Reporting is now carried out with the CERIA application, which makes it easier to monitor the data." Conversely, stakeholders

highlighted potential shifts in policy priorities, low public awareness and negative perceptions of iron supplementation, and regional disparities as factors that could hinder implementation, especially in remote schools. As one informant noted, "*Masih ada siswa yang tidak mau minum TTD dikarenakan takut efek samping atau merasa tak perlu*" ("Some students do not want to take iron supplements due to fear of side effects or because they feel it is not necessary").

Stakeholder accounts converged on the importance of cross-sector coordination as an implementation strength and on the need to strengthen monitoring, school-level implementation, human resource capacity, and community engagement. However, the extent to which these conditions were experienced varied across implementation settings, particularly among schools with different levels of capacity and access. These qualitative findings formed the basis for classifying the identified conditions as strengths, weaknesses, opportunities, and threats in the IFE and EFE matrices.

Interview findings were compared with programme documents, field observations, and available monitoring records. Evidence regarding cross-sector coordination and the availability of programme resources was generally consistent with stakeholder accounts. However, observations and document review also indicated variation in programme implementation across schools, supporting stakeholders' reports of inconsistent implementation. The lack of an integrated and structured monitoring and evaluation system further supported the interview findings regarding weaknesses in routine monitoring and evaluation. These sources were therefore used to corroborate, rather than replace, stakeholder accounts in developing the strategic factors.

Internal Condition of the Nutrition Action Movement

Based on the interviews, several internal factors affecting implementation of the Nutrition Action Movement were identified. These factors comprise strengths and weaknesses that influence programme planning, implementation, monitoring, and long-term sustainability (Table 1).

Table 1. Internal Factor Evaluation

Strengths	Weight	Rating	Score
S1. Cross-sector collaboration between the District Health Office and Community Health Centres support implementation of the Nutrition Action Movement.	0.12	3	0.36
S2. A school-based and participatory approach involving teachers, students, and health workers.	0.10	3	0.30
S3. Human resources responsible for the Nutrition Action Movement are available at the District Health Office and Community Health Centres.	0.10	3	0.30
S4. A clear procurement mechanism is in place for iron supplements as part of the Nutrition Action Movement, and supplies are consistently available.	0.11	3	0.33
S5. Equipment for assessing anaemia status is available at every Community Health Centre.	0.07	3	0.21
Weaknesses			
W1. Over-reliance on the District Health Office.	0.12	2	0.24
W2. Irregular implementation, with several schools not yet implementing the Nutrition Action Movement.	0.11	1	0.11
W3. Limited human-resource capacity, as not all teachers have adequate nutrition competencies to provide effective education.	0.10	2	0.20
W4. Lack of an integrated and structured monitoring and evaluation system for the Nutrition Action Movement.	0.10	1	0.10
W5. Logistical and funding limitations, including unavailable breakfast ingredients and educational materials that depend on government budget allocations.	0.07	1	0.07
Total IFE Score			2.22

The Internal Factor Evaluation analysis yielded a total internal score of 2.22 for the Nutrition Action Movement programme. This indicates a relatively weak overall internal position and a need for strategic strengthening. However, several key strengths have the potential to become important assets in supporting programme sustainability (15). The greatest strength was cross-sector integration between the District Health Office and Community Health Centres (score = 0.36), indicating that institutional collaboration is well established and serves as a foundation for programme implementation. Cross-sector collaboration is a key factor in the success of community-based nutrition interventions, particularly in reaching adolescents in school settings (16).

The school-based and participatory approach involving teachers, students, and health workers was also a significant strength, with a score of 0.30. This approach aligns with school-based health promotion, which is considered effective in improving adolescents' health knowledge and behaviour, including adherence to iron supplementation (17). However, these strengths have not offset several important internal weaknesses. The main weaknesses are irregular programme implementation in schools and the lack of a structured monitoring and evaluation system, with low scores of 0.11 and 0.10, respectively. The absence of a systematic monitoring mechanism can hamper measurement of programme outcomes and reduce the overall effectiveness of nutrition interventions (18). Previous studies have shown that limited monitoring and evaluation systems can

reduce the effectiveness of adolescent nutrition programmes because interventions cannot be adjusted according to field conditions and programme achievements (19). In addition, irregular implementation in schools is often linked to weak stakeholder coordination and limited implementer capacity, resulting in low adherence to iron supplementation among adolescent girls (20). Previous studies also emphasise that strengthening the capacity of teachers and school health staff is essential to improve the effectiveness, compliance, and sustainability of anaemia prevention programmes (21–23).

Other weaknesses contributing to the low IFE score are the programme's dependence on the District Health Office, limited teacher nutrition competencies, and logistical and funding constraints. These conditions indicate that the programme remains dependent on structural government support and school-level capacity (20). Robust monitoring and evaluation are important for accountability and evidence-informed improvement in nutrition systems (24). Therefore, internal strengthening strategies are needed, including increasing teacher capacity, developing monitoring and evaluation systems, and diversifying funding sources to ensure that the Nutrition Action Movement operates more effectively and sustainably (20,24).

External Factors

Based on the interviews, several external factors affecting implementation of the Nutrition Action Movement were identified. These factors comprise opportunities and threats that substantially affect policy formulation, resource allocation, stakeholder coordination, and implementation across sectors and administrative levels (Table 2).

Table 2. External Factor Evaluation

Opportunities	Weight	Rating	Score
O1. National support through the Indonesian Ministry of Health encourages expansion of the Nutrition Action Movement as a national strategy to reduce stunting and anaemia.	0.15	3	0.45
O2. Digitalisation of reporting and monitoring of iron supplement consumption through the CERIA (Prevent Anaemia in Indonesian Youth) platform.	0.12	2	0.24
O3. Partnerships with the private sector and community organisations can provide resources and support for health promotion.	0.08	2	0.16
Threats			
T1. A shift in national policy priorities could reduce financial support for the Nutrition Action Movement.	0.15	2	0.30
T2. Low public awareness of nutrition contributes to negative views about iron supplement consumption.	0.30	1	0.30
T3. Regional inequalities in access create barriers to programme implementation for schools in remote areas.	0.20	1	0.20
Total EFE Score			1.65

The External Factor Evaluation (EFE) analysis yielded a total score of 1.65 for the Nutrition Action Movement programme, well below the average of 2.5. This score reflects a relatively weak overall strategic response of the programme to its external opportunities and threats rather than the relative prevalence or dominance of either type of factor. The largest opportunity was national policy support from the Indonesian Ministry of Health, which received the highest single weighted score (0.45). This support reflects the central government's commitment to making the Nutrition Action Movement part of the national strategy to reduce stunting and anaemia among adolescents. National policies play a crucial role in providing a legal and legitimising basis for public health programmes, particularly population-based nutrition interventions for adolescents (25). However, these external opportunities have not been fully utilised. Digitalisation of reporting and monitoring of iron supplement consumption through the CERIA platform received a score of 0.24, suggesting that the programme's response to this opportunity remains limited at the implementation level. Digital systems nevertheless have substantial potential to improve adherence to iron supplementation, strengthen monitoring systems, and support data-driven decision-making (26). In addition, partnership opportunities with the private sector and community groups received a score of 0.16, indicating that the programme has not maximised partnerships to mobilise resources and support health-promotion activities. The low total EFE underscores the urgent need to strengthen the programme's capacity to exploit these opportunities through digital tools and multisectoral engagement.

Among the threats, low public awareness of the importance of iron supplementation (T2) carried the highest factor weight (0.30). However, it received the lowest rating of 1, resulting in a weighted score of 0.30. This indicates that although negative community perceptions represent the most critical barrier to programme acceptance and compliance, the programme's current response to this threat remains poor and inadequate. More broadly, food-literacy interventions have been evaluated as approaches to improve food-related knowledge and behaviours across socioeconomic groups (27). In addition, regional access disparities (T3; score = 0.20) and possible shifts in national policy priorities (T1; score = 0.30) pose substantial threats, particularly for schools in remote areas where infrastructure and resources are limited. This situation underscores the need for adaptive strategies that rely not solely on central policies but also on stronger community-based approaches and greater regional capacity to implement the Nutrition Action Movement sustainably (28).

Alternative Strategies for Improving the Nutrition Action Movement

After the programme's position had been characterised using the Internal–External Matrix, alternative strategies were developed through TOWS matching of internal weaknesses with external opportunities and threats. This approach helps identify feasible, context-specific implementation priorities to strengthen programme delivery, stakeholder coordination, and resource allocation. Because implementation occurs within complex organisational and community processes, stakeholder participation remains important when contextualising strategic options (11).

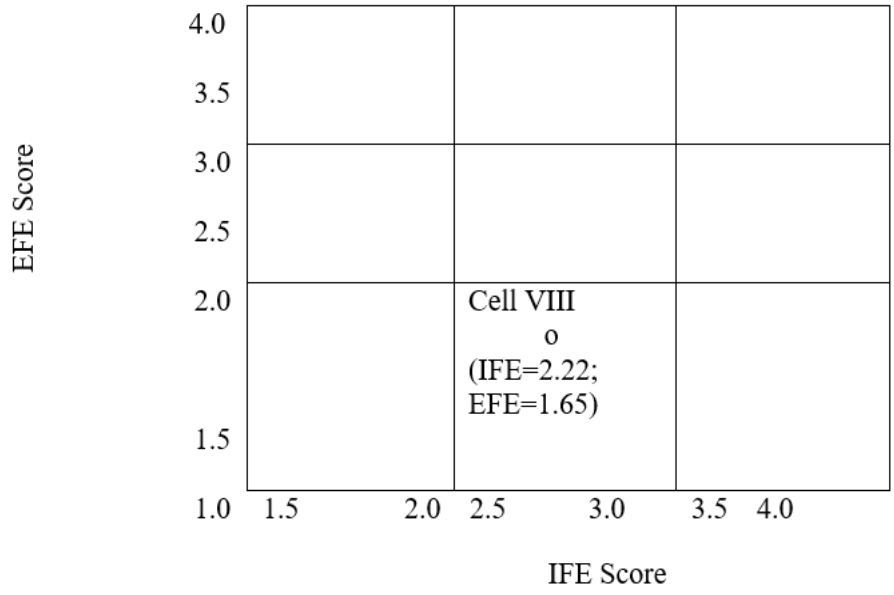


Figure 1. Position of the Nutrition Action Movement in the Internal–External Matrix

Based on the nine-cell Internal–External (IE) Matrix, the Nutrition Action Movement programme was positioned according to its total IFE and EFE scores. The IFE score of 2.22 falls within the average internal position (2.00–2.99), whereas the EFE score of 1.65 falls within the low external-response position (1.00–1.99). Accordingly, the programme was positioned in Cell VIII of the IE Matrix (Figure 1). This position indicates a broad strategic posture of harvest or divest, highlighting the urgent need to strengthen the programme's internal capacity while improving its response to the external environment. Following this two-stage analytical sequence, the IE Matrix position was used solely to characterise the programme's overall strategic position, while specific actionable strategic alternatives were subsequently developed using the TOWS framework. The TOWS analysis generated both Weakness–Threat (WT) strategies (to minimise internal weaknesses while mitigating external threats) and Weakness–Opportunity (WO) strategies (to leverage external policy and digital opportunities to address structural internal weaknesses), as shown in Table 3. This strategic position suggests that although national policy support is available, challenges remain, including low public awareness of iron supplementation, unequal regional access, and possible changes in national policy (20). Meanwhile, internal problems such as weak monitoring and evaluation, inconsistent programme implementation in schools, and inadequate human resource capacity hinder the programme's ability to exploit available opportunities. These findings reinforce the importance of robust monitoring and accountability systems for evidence-informed improvement in nutrition programmes (24). Following the IE Matrix assessment, an additional consultation was conducted with the four members of the Provincial Stunting Task Force Expert Team to contextualise and refine the strategic implications of the findings. The expert team reviewed the priority weaknesses and threats identified through the IFE–EFE analysis and provided recommendations for addressing these implementation challenges. The recommendations were documented and considered alongside the TOWS matching presented in Table 3, which includes both WT and WO strategies. Comparable qualitative nutrition-programme analyses have likewise identified resource constraints, intersectoral collaboration, and monitoring and evaluation as important implementation considerations (29).

Table 3. Alternative Strategies for the Nutrition Action Movement Based on TOWS Matrix Matching

TOWS	Internal Factor	External Factor	Alternative Strategy
WT1	Irregular implementation of the Nutrition Action Movement in schools (W2)	Regional inequalities in access, especially in remote areas (T3)	Establish minimum school-based standard operating procedures (SOPs) and routine support from Community Health Centres to ensure sustainable implementation in all regions.
WT2	Limited teachers' nutrition competencies (W3)	Low public awareness and negative perceptions of iron supplementation (T2)	Implement structured nutrition training for teachers and school health unit (UKS) staff so that nutrition education can be delivered consistently and contextually to students and parents.

TOWS	Internal Factor	External Factor	Alternative Strategy
WO1	Lack of an integrated and structured programme monitoring and evaluation system (W4)	Digitalisation of reporting and monitoring of iron supplement consumption through the CERIA platform (O2)	Develop and mandate the use of an integrated digital monitoring system (CERIA platform) for routine evaluation and data-based decision-making.
WO2	Logistical and funding limitations of the programme (W5)	Partnerships with the private sector and community organisations that can provide resources and support for health promotion (O3)	Encourage partnerships with the private sector, corporate social responsibility (CSR) initiatives, and community organisations to support logistics, educational materials, and health-promotion activities.

DISCUSSION

Internal Factor Evaluation

The IFE analysis showed that the internal performance of the Nutrition Action Movement programme was not yet optimal (IFE score = 2.22). This score indicates relatively low internal capacity, although the programme has several strategic strengths (12). An important asset is cross-sector partnership, particularly between the District Health Office and Community Health Centre, which is a key element of programme implementation. This is consistent with research emphasising the importance of integrated coordination in the success of community nutrition interventions (30).

The school-based and participatory approach involving teachers, students, and health workers was another important strength. School-based nutrition interventions can improve adolescents' knowledge and health behaviours (9,22). However, these strengths do not fully offset current barriers. The main constraints are the lack of an integrated and structured programme monitoring and evaluation system, inconsistent programme implementation across schools, and limited human resource capacity, including teachers' capacity to deliver nutrition education (19).

The absence of structured monitoring and evaluation restricts the programme's capacity to assess progress and support data-driven improvement (24). Likewise, inconsistent implementation may reflect weak coordination or standardisation and may contribute to unequal programme outcomes. These results indicate that internal systems and capacities for programme delivery, monitoring, and sustainability planning require strengthening.

External Factor Evaluation

The External Factor Evaluation (EFE) analysis yielded a total score of 1.65, which is below the average score of 2.50 and indicates a relatively weak strategic response to external opportunities and threats. Although national policy support provides a strong basis for programme expansion, it has not been fully leveraged at the implementation level (30). Government commitment to reducing anaemia and stunting represents an important opportunity, particularly for strengthening programme legitimacy and resource allocation (18); however, the programme has not maximised these favourable external factors.

However, the use of digital innovations, such as the CERIA platform for monitoring and reporting, remains suboptimal. This suggests limited technological capacity and adaptation among programme implementers. Furthermore, links with the private sector and community organisations have not been fully utilised, limiting opportunities for resource diversification and programme support (20).

Several external threats were identified through stakeholders' operational experiences. Low public awareness and negative community perceptions of iron supplementation were viewed by key implementers as significant barriers to programme acceptance and student adherence. Although these observations reflect implementers' perspectives rather than a direct community survey, broader food-literacy evidence indicates that targeted interventions can improve food-related knowledge and behaviours, although this evidence is not specific to adolescent anaemia (27). Moreover, inequities in programme access across regions, especially in remote areas, create further implementation challenges. Overall, the programme's relatively weak response to the external environment indicates a need for adaptive strategies that combine policy support with stronger community engagement and local capacity building (31).

Alternative Strategies for Improving the Nutrition Action Movement

The programme falls within Cell VIII of the IE Matrix, indicating an overall defensive strategic posture. Specific implementation actions were then derived through TOWS matching, including both WT and WO strategies. The strategic implications therefore do not stem solely from the matrix position; they are also informed by the implementation weaknesses, external threats, and external opportunities identified in the qualitative findings. Inconsistent implementation across schools (W2) and limited teacher capacity (W3), together with geographical inequities in access (T3), may reduce the ability to deliver consistent nutrition education and iron supplementation. Therefore, standardised operational procedures for programme implementation should be developed in schools to establish minimum implementation standards, clarify the roles of teachers and health workers, and reduce variation among schools. Enhanced routine support and monitoring through Community Health Centres may also address weaknesses in programme monitoring (W4) and facilitate continuity of implementation, particularly in schools with limited access to health services. Evidence from another rural population also illustrates the context-specific nature of anaemia determinants, although direct extrapolation across populations is inappropriate (32).

The results suggest that limited teacher nutrition competencies (W3) and perceived student concerns about iron supplementation (T2) are potential barriers to nutrition literacy, informed decision-making, and adherence to iron supplementation. Alongside structured nutrition training for teachers and school health personnel, communication and education strategies are needed to address misconceptions and concerns about iron supplementation (14,15). Building the

capacity of school personnel in this way can support more consistent nutrition education, better communication with students and parents, and stronger engagement with health workers. These strategies can be translated into implementation-oriented actions addressing school-level programme delivery, nutrition literacy, adherence to iron supplementation, access to services, and stakeholder engagement.

Another important strategy is the development of an integrated monitoring and evaluation system, particularly through optimisation of digital platforms such as CERIA. Such a system can support real-time data collection, improve programme accountability, and enable evidence-based decision-making (33). In addition, greater collaboration with the private sector, corporate social responsibility (CSR) initiatives, and community-based organisations may help address logistical and funding challenges (25).

A similar study of public health programmes in Indonesia used IFE–EFE analysis as a starting point for strategic planning (12). Studies of stunting reduction programmes in different districts have shown that inadequate human resources, under-optimised multisectoral coordination, and financial limitations can keep programmes in defensive or hold-and-maintain positions in the IE Matrix (34). Related maternal and child health evidence shows that effective service coverage can be substantially lower than crude coverage once service quality is taken into account (35). The Cell VIII position observed in West Lombok therefore appears comparable to positions reported for public health programmes in resource-limited settings. However, the high prevalence of anaemia, broad geographical coverage, and substantial interregional variation make the West Lombok context more complex and require more context-specific and adaptive strategic responses (36).

Finally, targeted community nutrition education campaigns are important for addressing negative perceptions and improving programme acceptance. Combining internal strengthening measures with external adaptation may help overcome local delivery constraints and support continued implementation of the Nutrition Action Movement (12,13,16).

Interpretation Of Key Findings

The results show that implementation barriers in West Lombok are interrelated. Limited school capacity, insufficient teacher training, and inadequate monitoring can contribute to inconsistent programme implementation, while geographical barriers can impede access to health-centre support and iron supplementation. Stakeholders also raised concerns about the perceived need for iron supplementation among some students, which could affect programme participation. Although these data are based on stakeholder perceptions, they illustrate the need to strengthen health-promotion efforts through regular communication, stakeholder engagement, and school capacity building. While some challenges are specific to West Lombok, others, including limited monitoring, human resource capacity, and stakeholder coordination, may also apply to comparable programmes elsewhere. These findings therefore emphasise the need for an integrated, locally responsive approach to strengthen sustainable anaemia prevention.

Comparison With Previous Studies

The findings corroborate previous research on under-resourcing of adolescent nutrition programmes, inadequate monitoring, limited community knowledge of iron supplementation, and poor coordination (20,24). Similar findings were reported by Samsudin et al. (12), who reported that districts with lower stunting reduction had weaker IFE–EFE positions and challenges involving leadership capacity, human resources, budget constraints, and programme sustainability. The current findings, however, differ from studies conducted in settings with stronger health-system support, where school-based nutrition interventions have shown greater implementation effectiveness and higher adherence to iron supplementation programmes (21–23). These differences may reflect variation in regional infrastructure, human resource capacity, and community nutrition literacy, emphasising the need for context-specific approaches to strengthening anaemia prevention interventions for adolescent girls.

Limitations And Cautions

This study provides information on implementation of the Nutrition Action Movement programme, but several limitations should be noted. First, the qualitative cross-sectional design precludes causal inference and retrospective assessment of changes in programme implementation over time. Comparable Indonesian programme evaluations have likewise used qualitative IFE–EFE analysis to characterise implementation conditions rather than causal effects (12). Second, the findings were not based on the views of adolescent girls, parents, or community members themselves and may therefore be subject to interpretive and response biases. Third, reliance on organisational actors may introduce implementer or elite bias in the identification and rating of strategic factors. Fourth, the study was conducted in West Lombok Regency, West Nusa Tenggara Province; therefore, the IFE and EFE findings may not be broadly generalisable to other contexts. Future studies should use mixed-methods or longitudinal designs, engage programme beneficiaries in study design, and include a wider geographical scope to strengthen evidence on programme implementation, effectiveness, and sustainability.

Recommendations For Future Research

Future studies should use longitudinal or mixed-methods designs to assess the long-term effectiveness and sustainability of the Nutrition Action Movement programme. Research with larger and more diverse samples across multiple regional settings is also needed to strengthen the generalisability of the findings. Furthermore, future studies should evaluate the effects of digital monitoring of iron supplementation, community-level nutrition education, and multisectoral partnership initiatives on iron supplement uptake and anaemia prevalence among adolescent girls.

CONCLUSION

The study identified internal and external factors that influence implementation of the Nutrition Action Movement for anaemia prevention among adolescent girls in West Lombok Regency. The strategic assessment identified implementation challenges, including inconsistent programme delivery, limitations in monitoring and evaluation and human-resource capacity, and resource constraints, alongside opportunities related to policy support, digitalisation, and multisectoral collaboration. The priority areas for programme strengthening identified through the IFE–EFE and TOWS analyses are consistency of implementation, monitoring and evaluation capacity, competencies of teachers and programme implementers, optimisation of digital monitoring systems, and multisectoral collaboration. These priorities do not necessarily reflect impact on anaemia reduction; rather, they are intended to support implementation of programme activities within the study context. The study provides a context-specific strategic evaluation of implementation conditions using the IFE–EFE framework and provides a foundation for future implementation-focused evaluations and outcome studies.

The findings may inform implementation of the Nutrition Action Movement; however, several limitations should be considered. The study used a qualitative cross-sectional design and was conducted in West Lombok Regency, West Nusa Tenggara Province, which may limit the generalisability of the findings. Future studies should consider long-term follow-up or mixed-methods designs with broader provincial coverage to clarify the effects of adolescent anaemia prevention efforts over time and support evidence-informed public health policy and practice.

DECLARATIONS

Author contributions: BFR: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing. AK: Conceptualization, Methodology, Formal analysis, Supervision, Writing – review & editing. HR: Methodology, Formal analysis, Supervision, Writing – review & editing. CMD: Methodology, Formal analysis, Supervision, Writing – review & editing. All authors contributed to the interpretation of the findings, read and approved the final manuscript for publication, and accept accountability for their contributions and the integrity of the work.

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