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Assessment of Factors Influencing Effective Implementation of Health Projects in Humanitarian Settings: A Case of Seasonal Malaria Chemoprevention Project by Malaria Consortium in Northern Bahrelgazal State, South Sudan

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A B S T R A C T

Background: In humanitarian settings, the successful implementation of health projects faces numerous challenges. This study focuses on the Seasonal Malaria Chemoprevention (SMC) project by Malaria Consortium in Northern Bahrelgazal State, South Sudan, assessing the factors influencing its effectiveness.

Objectives: The research aims to identify and evaluate the key factors that affect the implementation of the SMC project, with a focus on stakeholder engagement, resource availability, community participation, human resource capacity, healthcare infrastructure, socio-political stability, cultural factors, and project management.

Methods: A mixed-methods approach was employed, involving both qualitative and quantitative data. Purposive sampling for qualitative data collection and probability sampling for quantitative data collection were used. Surveys, interviews, and document analysis were conducted among key stakeholders, including government officials, healthcare workers, community leaders, and beneficiaries. Data were analyzed to determine the impact of various factors on the project's success.

Findings: The study found that the effectiveness of the SMC project was significantly influenced by stakeholder engagement, with inconsistent participation leading to planning and execution gaps. Financial and material resource constraints, coupled with a shortage of trained healthcare workers, limited the project's scale and reach. Community participation varied, with higher involvement correlating with better outcomes. Inadequate healthcare infrastructure and socio-political instability further hindered the project, while cultural beliefs and social dynamics affected community acceptance. Effective leadership and project management were identified as critical to overcoming these challenges.

Conclusion: The research highlights the complex interplay of factors that influence the implementation of health projects in humanitarian settings. It underscores the need for comprehensive stakeholder engagement, adequate resource allocation, capacity building, improved infrastructure, and adaptive strategies to address socio-political and cultural challenges.

Keywords: Seasonal Malaria Chemoprevention, health project implementation, humanitarian settings, stakeholder engagement, resource allocation, community participation, capacity building, healthcare infrastructure, socio-political instability, South Sudan

1. INTRODUCTION

1.1 Background of the study

Health projects play a vital role in addressing public health issues, especially in regions like South Sudan, where disease burdens are high (UNICEF, 2024). South Sudan, a country recovering from years of conflict and instability, faces significant health challenges, including malaria, malnutrition, and limited access to healthcare services (Doctors Without Borders, 2023). These problems are further compounded by poverty, political uncertainty, and weak health infrastructure, making the delivery of essential health services difficult (UNICEF, 2024).

Northern Bahr el Ghazal State, located in northwest South Sudan, is one of the hardest-hit regions in terms of malaria prevalence (Khan et al., 2024). Malaria transmission is particularly high during the rainy season when mosquito populations increase, leading to a surge in infections (Malaria Consortium, 2023). Unfortunately, access to healthcare remains limited in the region, with inadequate diagnostic and treatment services exacerbating the

situation (Doctors Without Borders, 2023). Furthermore, community awareness about malaria prevention strategies, such as the use of insecticide-treated bed nets and seasonal malaria chemoprevention (SMC), remains low (Malaria Consortium, 2023).

To combat these challenges, organizations such as the Malaria Consortium and other NGOs have been implementing health interventions in the region (Malaria Consortium, n.d.). These initiatives include distributing insecticide-treated mosquito nets, providing SMC, offering malaria diagnostic and treatment services, and training healthcare workers (Malaria Consortium, 2023). However, the implementation of these health projects faces numerous obstacles, such as insufficient funding, weak healthcare infrastructure, a shortage of trained medical personnel, political instability, and logistical barriers (UNICEF, 2024). Additionally, cultural beliefs, language differences, and the remoteness of many communities make it difficult to fully engage the population in malaria prevention and treatment efforts (Malaria Consortium, 2023).

Given these persistent challenges, it is essential to investigate the factors influencing the success of health projects in Northern Bahr el Ghazal State (Khan et al., 2024). A deeper understanding of the region's historical, social, and political landscape will help identify the best strategies for improving healthcare services (UNICEF, 2024). This study aims to explore these aspects and provide insights that will guide more effective health project implementation (Doctors Without Borders, 2023). The ultimate goal is to strengthen healthcare systems, improve malaria control efforts, and ensure that health interventions are both effective and sustainable in resource-limited settings like Northern Bahr el Ghazal State (Malaria Consortium, 2023).

1.2 Problem Statement

Despite concerted efforts by governmental and non-governmental organizations to address malaria and improve healthcare services in Northern Bahr el Ghazal State, South Sudan, challenges persist in effectively implementing health projects (World Health Organization [WHO], 2021). These challenges stem from multiple factors that hinder the successful delivery of healthcare interventions and exacerbate the burden of diseases such as malaria (UNICEF, 2023).

One of the primary challenges is the inadequacy of resources, both financial and human, allocated to health projects in the region (WHO, 2021). Limited funding restricts the scale and scope of interventions, hindering the procurement of essential medical supplies, infrastructure development, and operational costs (Global Fund, 2022). Similarly, the shortage of skilled healthcare workers, including doctors, nurses, and community health workers, undermines the capacity to deliver healthcare services effectively, particularly in remote and underserved areas (Peters et al., 2019).

Furthermore, limited healthcare infrastructure poses a significant barrier to the effective implementation of health projects in Northern Bahr el Ghazal State (Smith, 2017). Many health facilities lack basic amenities, equipment, and infrastructure necessary for providing quality healthcare services (UNICEF, 2023). This shortage of infrastructure not only affects service delivery but also compromises the safety and well-being of healthcare workers and patients (Smith, 2017).

Socio-political instability is another critical challenge that hampers health project implementation in the region (Buse et al., 2018). Ongoing conflict, violence, and political unrest disrupt the delivery of healthcare services, undermine public health interventions, and exacerbate the vulnerability of communities to diseases such as malaria (International Crisis Group, 2023). Additionally, socio-political instability complicates logistical operations, restricts access to healthcare facilities, and impedes community engagement efforts, further exacerbating health disparities and hindering progress in disease control efforts (Buse et al., 2018).

Moreover, limited community engagement and awareness pose challenges to health project implementation in Northern Bahr el Ghazal State (Chopra et al., 2019). Cultural beliefs, language barriers, and geographical remoteness hinder effective communication and collaboration between healthcare providers and communities (Malaria Consortium, 2023). This lack of engagement undermines efforts to promote preventive measures, encourage healthcare-seeking behavior, and foster community ownership of health projects, ultimately impacting the sustainability and effectiveness of interventions (Chopra et al., 2019).

The effective implementation of health projects in Northern Bahr el Ghazal State is hindered by a complex interplay of factors, including inadequate resources, limited healthcare infrastructure, socio-political instability, and challenges in community engagement (WHO, 2021). Addressing these challenges requires a comprehensive understanding of the underlying drivers and systemic barriers to health project implementation, along with targeted strategies to overcome these obstacles and improve health outcomes in the region (Global Fund, 2022).

1.3 Rationale of the Study

The rationale for this study arises from the need to address the persistent challenges in effectively implementing health projects in Northern Bahr el Ghazal State, South Sudan. Despite ongoing efforts, including those by the Malaria Consortium, to combat malaria and improve healthcare services, various challenges hinder the achievement of desired health outcomes (Malaria Consortium, 2023). Limited resources, weak healthcare infrastructure, and socio-political instability contribute to the difficulty in delivering effective health interventions (WHO, 2021).

Given these challenges, a systematic examination of the factors influencing project implementation is essential for developing evidence-based recommendations to enhance project effectiveness and sustainability (Peters et al., 2019). Identifying and addressing barriers to health project implementation can help optimize resource allocation, improve healthcare service delivery, and strengthen community engagement in disease prevention and control efforts (Global Fund, 2022). By conducting this study, policymakers, healthcare providers, and development organizations will gain valuable

insights to design more effective health interventions tailored to the unique needs of Northern Bahr el Ghazal State, ultimately improving health outcomes in the region.

1.4 Objectives of the Study

The objectives of this study are as follows:

- To identify the key factors influencing the effective implementation of health projects in Northern Bahrelgazal State, South Sudan.
- To assess the role of stakeholder engagement in supporting health project implementation in the region.
- To evaluate the impact of human resources and capacity building initiatives on the delivery of health projects in Northern Bahrelgazal State.

1.5 Research Questions of the Study

The research questions guiding this study are as follows:

- What are the primary factors influencing the effective implementation of health projects in Northern Bahrelgazal State, South Sudan?
- How does stakeholder engagement contribute to the success of health project implementation in the region?
- What is the impact of human resources and capacity building initiatives on the delivery of health projects in Northern Bahrelgazal State?

2. METHODOLOGY

2.1 Study Design

Cross sectional study design was used to explore factors affecting health project implementation in Northern Bahrelgazal State.

2.2 Study Area

The research was conducted in Northern Bahrelgazal State, South Sudan, and a malaria-endemic region with limited healthcare infrastructure. The population relies on subsistence farming and pastoralism**,** facing health challenges due to seasonal climate variations and poor access to clean water.

2.3 Study Population

Participants included government officials, healthcare workers, community leaders, NGOs, international agencies, and community members benefiting from health projects.

2.4 Sample Size and Sampling Technique

A total of 156 participants were selected using purposive sampling for key informants in qualitative data collection and probability sampling (stratified random sampling) for community members and service users in quantitative data collection.

2.5 Data Collection

Data was collected through Semi-structured interviews with stakeholders, Surveys with beneficiaries and Document reviews of reports and policies.

2.6 Data Analysis

Data was analysed using descriptive and inferential statistical techniques to summarize findings, test hypotheses, and identify associations between variables.

2.7 Ethical Considerations

Informed consent**,** confidentiality, and privacy were ensured, adhering to ethical guidelines and institutional review board standards.

2.8 Limitations of the study

Challenges included participant selection biases, data collection constraints, and limited generalizability due to the study's specific context. Efforts were made to minimize biases and enhance data quality**.**

3. RESULT

3.1 Demographics and Background Information

Table 1: Age group of the participants

Age	No.	%
18-25	25	16.03
26-35	55	35.26
36-45	40	25.64
46-55	25	16.03
56+	11	7.05
Total	156	100

18-25 Years (16.03%): This younger age group represents a significant portion of the population, likely consisting of individuals who are early in their careers or pursuing education. Their involvement in health projects might be limited by their lack of experience or lower priority given to health interventions compared to other age groups.

26-35 Years (35.26%): This age group is the largest segment of your population. These individuals are typically in their prime working years, possibly with young families. They are likely to be highly engaged in health matters, particularly those related to family health, such as immunizations and maternal health. Their active participation can significantly influence the success of health interventions.

36-45 Years (25.64%): This group is also substantial, representing a mature segment of the population, likely with more stable careers and possibly in leadership or decision-making roles within the community. They may have significant influence on community health practices and can be crucial in promoting health project adoption.

46-55 Years (16.03%): Individuals in this age bracket are often more settled in their ways and might be less adaptable to new health interventions unless they see direct benefits. They may prioritize chronic disease management and long-term health outcomes over other health projects.

56+ Years (7.05%): The smallest group, these are older adults who might have more health needs but are also likely to be more skeptical or resistant to new health projects, especially if they perceive them as intrusive or unfamiliar. Their lower representation might also indicate a need for targeted outreach to ensure their inclusion in health programs.

Therefore, the age distribution suggests that the majority of the population is within the working age, with a strong potential for engagement in health projects. The project implementation strategies should consider the different health priorities and engagement levels across these age groups, ensuring that interventions are relevant and accessible to each segment.

Table 2: Gender Distribution

Gender	No.	%
Male	89	57.05
Female	67	42.95
Total	156	100

Male (57.05%): The majority of respondents are male, which may reflect societal norms where men are more likely to participate in surveys or are more available during the times data was collected. Men in this context might be more engaged in decision-making processes related to health projects, particularly in rural settings where traditional gender roles are more pronounced.

Female (42.95%): The female respondents, while fewer, represent a significant portion of the population. Women's health needs, particularly related to maternal and child health, are often critical in such settings. However, their slightly lower participation might suggest barriers to their involvement in health projects, such as cultural constraints or time availability due to household responsibilities.

The gender distribution indicates that both men and women are key stakeholders in health project implementation. However, given the slight male majority, it may be necessary to develop targeted strategies to ensure that women's voices and needs are adequately represented and addressed in the planning and implementation of health interventions.

Table 3: occupation

Occupation	No.	%

Healthcare Worker	41	26.28
Government Employee	29	18.59
Farmer	44	28.21
Teacher	21	13.46
Other	21	13.46
Total	156	100

Farmers (28.21%): The largest occupational group, farmers likely represent the rural majority who depend on agriculture for their livelihoods. Their health needs might be tied closely to seasonal work patterns, exposure to environmental risks, and limited access to healthcare facilities. Ensuring that health interventions are compatible with their farming schedules and address occupational health risks is crucial.

Healthcare Workers (26.28%): This significant proportion of healthcare workers suggests a strong presence of individuals directly involved in health service delivery. Their insights are invaluable for understanding the on-ground challenges and opportunities in implementing health projects. They also play a critical role in community health education and capacity building.

Government Employees (18.59%): These respondents likely have a stable income and access to information and resources. They might also be involved in policy-making or administrative roles, influencing the allocation of resources and support for health projects.

Teachers (13.46%): Teachers are often community leaders and can be influential in health education and promoting health initiatives among students and parents. Their involvement in health projects can help in disseminating information and fostering community participation.

Other Occupations (13.46%): This category includes various other occupations that might not be directly related to healthcare or agriculture but still play a role in the community's socio-economic dynamics. Their health needs and engagement in projects might vary widely.

The occupational diversity suggests that health project implementation needs to be multifaceted, addressing the unique needs and constraints of different occupational groups. Farmers and healthcare workers are particularly critical, as they represent both the primary beneficiaries and the implementers of health interventions. Engaging government employees and teachers can further enhance the reach and effectiveness of health projects.

Table 4: level of education

Education Level	**No.**	**%**
No Formal Education	15	9.62
Primary Education	50	32.05
Secondary Education	55	35.26
Tertiary Education	36	23.08
Total	156	100

No Formal Education (9.62%): This segment, though small, represents individuals who may have the most significant barriers to accessing and understanding health information. Special efforts may be needed to reach this group through community-based approaches or using visual and oral communication methods.

Primary Education (32.05%): A substantial portion of the population has only primary education, which might limit their ability to fully comprehend complex health information or engage in technical aspects of health projects. Simplified messaging and practical demonstrations could be effective for this group.

Secondary Education (35.26%): The largest group, these individuals have a moderate level of education, likely giving them the ability to engage more actively in health projects, understand health risks, and participate in decision-making processes.

Tertiary Education (23.08%): These individuals are likely more informed and capable of taking leadership roles in health initiatives. They may be more critical of health interventions and expect higher standards in project implementation.

The varying levels of education in the population suggest a need for tailored communication strategies. Health messages and project activities should be accessible and understandable across different educational levels. For those with higher education, more detailed and data-driven information might be necessary, while for those with lower education levels, straightforward and practical messaging was more effective.

Table 5: residential address

Residential Area	No.	%
Urban	70	44.87
Rural	86	55.13
Total	156	100

Urban (44.87%): Urban residents might have better access to healthcare services and information, influencing their perceptions and engagement with health projects. However, urban settings also face unique challenges, such as overcrowding and pollution, which need to be addressed in project planning.

Rural (55.13%): The majority of respondents are from rural areas, where access to healthcare might be more limited, and traditional beliefs and practices could strongly influence health behaviors. Rural settings often require more outreach and community-based approaches to ensure effective health project implementation.

The rural-urban split in your population highlights the need for different strategies in these areas. Rural areas might require more intensive outreach and adaptation of health interventions to local contexts, while urban areas might benefit from more structured health services and infrastructure support.

3.2 Engagement and Participation in Health Projects

Table 6: Benefited from Health Projects

Benefited from Health Projects?	No.	%
Yes	92	58.97
No	64	41.03
Total	156	100

Table 7: Health Projects Benefited From

Type of Health Projects Benefited From	No.	%
Malaria Control	43	27.56
Immunization	64	41.03
Maternal Health	28	17.95
Other	21	13.46
Total	156	100

Beneficiaries of Health Projects (Table 6): A significant number (58.97%) of respondents have benefited from health projects, with immunization being the most cited benefit (41.03%) followed by malaria control (27.56%) (Table 7). This indicates that while the population is engaged with health services, malaria-specific interventions are less prominent, which may require more targeted efforts.

Table 8: Services Satisfaction

Satisfaction with Services	NO.	%
1 (Very dissatisfied)	19	12.18
2	20	12.82
3	62	39.74
4	18	11.53
5 (Very satisfied)	37	23.72
Total	156	100

Satisfaction with Services (Table 8): Satisfaction levels are varied, with 39.74% moderately satisfied (rating 3), and 23.72% very satisfied (rating 5).

However, a notable proportion expresses dissatisfaction (12.18% very dissatisfied and 12.82% rating 2), indicating areas for improvement in service delivery.

Table 9: Stakeholder engagement

Involved in Stakeholder Engagement?	**No.**	**%**
Yes	80	51.28
No	76	48.72
Total	156	100

Table 10: Effectiveness of Stakeholder Engagement

Effectiveness of Stakeholder Engagement	**No.**	**%**
1 (Not effective)	10	6.41
2	15	9.62
3	30	19.23
4	15	9.62
5 (Very effective)	10	6.41
Total	156	100

Stakeholder Engagement (Table 9): Just over half (51.28%) of the respondents report being involved in stakeholder engagement. However, the effectiveness of this engagement is mixed, with many rating it moderate (19.23%) or low (6.41% not effective at all) (Table 10). This highlights the need for better stakeholder involvement strategies.

3.3 Capacity Building and Resource Allocation

Table 11: capacity building

Observed Capacity Building Initiatives?	**No.**	**%**
Yes	95	60.90
No	61	39.10
Total	156	100

Table 12: capacity building effectiveness

Effectiveness of Capacity Building Initiatives	**Count**	
1 (Not effective)	15	9.62
2	20	12.82
3	30	19.23
4	20	12.82
5 (Very effective)	10	6.41
Total	156	100

Capacity Building (Table 11 & 12): A majority (60.90%) have observed capacity-building initiatives, though their effectiveness is perceived as moderate (19.23%) or low (9.62% not effective). This suggests that while efforts are being made, they may not be sufficiently impactful or well-targeted.

Table 13

: Resources availability

Availability of Resources	No.	%
1 (Inadequate)	25	16.03
2	30	19.23
3	40	25.64
4	35	22.44
5 (Sufficient)	26	16.67
Total	156	100

Resource Availability (Table 13): Perceptions of resource sufficiency are low, with only 16.67% believing resources are sufficient and a significant 16.03% rating them as inadequate. This indicates a clear gap in resource allocation which could hinder the effective implementation of health projects.

4.4 Funding and Community Involvement

Table 14: Funding constraints

Perception of Funding Constraints	No.	%
Yes	110	70.51
No	46	29.49
Total	156	100

Table 15: impact of funding constraints

Impact of Funding Constraints	No.	%
1 (Minor impact)	10	6.41
2	20	12.82
3	30	19.23
4	35	22.43
5 (Major impact)	15	9.62
Total	156	100

Funding Constraints (Table 14 & 15): A large majority (70.51%) perceive funding constraints as a significant issue, with 22.43% viewing it as having a major impact on project implementation. Addressing these financial challenges is likely critical for improving project outcomes.

Table 16: community involvement

Community Involvement	No.	%
Yes	90	57.69
No	66	42.31
Total	156	100

Community Involvement (Table 16): Over half (57.69%) of the respondents are involved in the community, which is positive, though nearly half are not. This split suggests there is room for greater community engagement.

Table 17: barriers to involvement

Barriers to Community Participation	**No.**	**%**
Language Barriers	55	35.26
Cultural Beliefs	45	28.87
Lack of Awareness	40	25.64
Other	16	10.26
Total	156	100

Barriers to Community Involvement (Table 17): Language barriers (35.26%) and cultural beliefs (28.87%) are the most significant barriers to community involvement, followed by a lack of awareness (25.64%). Addressing these barriers was key to enhancing community participation. (1)

4. SUMMARY, CONCLUSION AND RECOMMENDATION

4.1 Summary

The study revealed several critical factors that influenced the implementation of the Seasonal Malaria Chemoprevention (SMC) project in Northern Bahrelgazal State, South Sudan. Stakeholder engagement was inconsistent, leading to gaps in planning and execution. Resource constraints**,** including limited funding and shortages of essential supplies, further restricted the project's impact. The availability of trained healthcare **workers** was insufficient, making it difficult to provide quality services. Community participation also varied significantly—areas with strong engagement saw better results, while those with low involvement experienced resistance and reduced acceptance of interventions.

Additionally, inadequate healthcare infrastructure, such as poorly equipped facilities and limited transportation, posed significant barriers to service delivery. Socio-political instability, including conflict and political tensions, frequently disrupted project activities, causing delays and security concerns. Cultural beliefs and social norms, such as gender roles and household decision-making, played a major role in influencing the success of the project. The study also found that effective leadership and project management were crucial in overcoming challenges, but weaknesses in these areas often hindered progress and prevented the project from achieving its full potential.

4.2 Conclusion

The research concludes that multiple interconnected factors determine the success or failure of health projects in humanitarian settings like Northern Bahrelgazal State. The SMC project was significantly hindered by challenges such as weak stakeholder engagement, limited resources, inadequate healthcare infrastructure, and low community participation. The unstable political climate further complicated service delivery, disrupting outreach efforts and limiting engagement with local communities.

Cultural and social dynamics, including traditional beliefs and gender roles, also shaped how the project was received. Strong leadership and efficient management were essential in addressing these challenges, but where leadership was lacking, project goals remained unmet. Overall, the study highlights the need for a holistic, well-coordinated approach that considers these diverse challenges to improve health project outcomes in resource-limited and crisis-affected regions.

4.3 Recommendations

To enhance the effectiveness and sustainability of health projects like the SMC initiative in Northern Bahrelgazal State, several key actions are recommended. First, **stakeholder engagement must be strengthened** by fostering collaboration between government agencies, NGOs, and community-based organizations. **Community involvement** in planning, execution, and monitoring should be increased to enhance project acceptance and impact. Second, **resource allocation needs improvement**, including securing additional funding, ensuring efficient financial management, and addressing shortages of medical supplies and trained personnel.

Third**,** capacity-building initiatives should be prioritized to equip healthcare workers with the necessary skills, especially in remote and underserved areas. Fourth, healthcare infrastructure should be upgraded, including improving transportation networks and ensuring the availability of essential medical equipment. Fifth, to mitigate the effects of socio-political instability**,** contingency plans should be developed, and local leaders should be engaged in peace building efforts. Lastly, community awareness and ownership of health projects must be strengthened through targeted communication strategies and greater involvement in decision-making, ensuring long-term project sustainability and improved health outcomes.

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