Assessing Stakeholder Participation in Monitoring and Evaluation on the Performance of Push-Pull Technology Project in Homa Bay County, Kenya

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Abstract- ***Monitoring and Evaluation (M&E) is vital in ensuring accountability, learning, and improved performance of agricultural development projects. Stakeholder participation in M&E enhances project ownership, data accuracy, and timely decision-making. This study assessed the extent and effectiveness of stakeholder participation in the M&E of the Push-Pull agricultural project in Homa Bay County, Kenya. Specifically, the study examined stakeholder involvement in M&E planning, participation in data collection processes, and the mechanisms for sharing M&E results. A descriptive cross-sectional research design was employed, utilizing both quantitative and qualitative methods. Data were collected through structured questionnaires, focus group discussions with farmers, and key informant interviews with project implementers and extension officers. A stratified sampling technique was used to select 201 respondents from Mbita, Homa Bay Town, and Ndhiwa sub-counties where Push-Pull technology is actively promoted. Quantitative data were analyzed using descriptive statistics and inferential methods, while qualitative responses were thematically analyzed. Despite the significance in participation in planning and data collection with*** $\chi^2(1, N = 201) = 25.77, p < .001$ ***and*** $\chi^2(1, N = 201) = 33.69, p < .001$ ***respectively*** , ***challenges such as inadequate training, weak feedback mechanisms, lack of incentives, and misaligned donor timelines hindered timely and effective M&E outcomes. Furthermore, the dissemination of M&E results was sporadic and rarely influenced local-level decision-making. The study recommends strengthening participatory structures, improving stakeholder capacity, and aligning M&E practices with local agricultural cycles to enhance responsiveness and sustainability. These findings contribute to the discourse on participatory M&E and provide practical recommendations for improving project performance and impact in smallholder farming systems using Push-Pull and similar technologies.***

I. INTRODUCTION

Monitoring and Evaluation (M&E) have become integral components in the management of development projects, particularly in the agricultural sector, where they are essential for tracking progress, ensuring accountability, and informing decision-making. Effective M&E systems depend not only on technical tools and methodologies but also on the active participation of stakeholders—including farmers, extension officers, project staff, local administrators, donors, and community-based organizations. Stakeholder participation ensures that M&E processes are contextually relevant, transparent, and aligned with the needs of beneficiaries (Estrella & Gaventa, 1998; IFAD, 2021).

In Kenya, several donor-funded agricultural projects have adopted participatory approaches to increase local ownership, enhance learning, and promote the sustainability of interventions. Among these is the Push-Pull agricultural project, initiated by the International Centre of Insect Physiology and Ecology (icipe). The Push-Pull technology offers an environmentally friendly solution to pest and weed problems affecting smallholder farmers—using Desmodium to repel pests and suppress parasitic weeds like Striga, and Napier grass to attract and trap pests. In counties such as Homa Bay, where smallholder farmers rely heavily on maize and

sorghum production, the Push-Pull technology presents a viable path to improved food security, income generation, and soil health.

While the biological and agronomic success of the Push-Pull project is well-documented, less attention has been given to the effectiveness of its Monitoring and Evaluation systems, particularly from a stakeholder participation perspective. Reports indicate that in many agricultural projects, stakeholders are often only marginally involved in M&E activities—limited to being sources of data rather than active participants in planning, analysis, or learning processes (Mbiti et al., 2020; Odhiambo, 2022). Such limited participation undermines project responsiveness, data ownership, and the likelihood of long-term adoption.

In Homa Bay County, where agricultural extension services face capacity limitations and local community engagement varies across wards, the quality of stakeholder participation in M&E can significantly influence project outcomes. There is a notable empirical gap regarding the degree to which stakeholders in Homa Bay are involved in the planning, data collection, and results-sharing phases of M&E within the Push-Pull project. Addressing this gap is critical not only for improving current project performance but also for informing the design of more inclusive and sustainable M&E systems in future agricultural interventions.

This study therefore seeks to assess stakeholder participation in the monitoring and evaluation of the Push-Pull agricultural project in Homa Bay County, Kenya, focusing on three key areas: (1) involvement in M&E planning, (2) participation in data collection, and (3) mechanisms for sharing M&E results. The findings aim to contribute to both academic understanding and practical policy formulation for participatory agricultural development in the region.

II. PROBLEM STATEMENT

Despite substantial investment in agricultural innovations such as the Push-Pull technology in Kenya, the effectiveness and sustainability of these interventions remain uneven across regions. One critical factor influencing project performance is the extent of stakeholder participation in Monitoring and Evaluation (M&E). Globally and in Kenya, participatory M&E is increasingly recognized as essential for enhancing accountability, learning, and impact in agricultural development projects (Musomba, Mwaura, & Wambugu, 2020).

However, empirical studies show that stakeholder involvement in M&E processes—particularly in planning, data collection, and utilization of evaluation findings—is often limited or inconsistent (Nganga, Were, & Ouma, 2021). In the case of the Push-Pull agricultural project in Homa Bay County, little is known about how actively local stakeholders such as farmers, extension officers, and community groups are engaged in M&E activities, or how this engagement affects project performance.

Furthermore, the absence of localized data on stakeholder participation in M&E may lead to top-down decision-making, reduced project ownership, and weak feedback mechanisms. There is, therefore, a need to assess the level and quality of stakeholder involvement across key M&E stages in the Push-Pull project and to determine its influence on the perceived and actual performance of the technology. Addressing this gap is critical for improving the effectiveness of participatory agricultural interventions in Kenya and similar contexts.

III. LITERATURE REVEW

Stakeholder Participation in Planning of M&E Activities

Stakeholder participation in the planning phase of Monitoring and Evaluation (M&E) is fundamental to developing responsive, inclusive, and contextually appropriate project frameworks. When stakeholders are involved in setting objectives, determining performance indicators, and selecting data sources, M&E becomes more relevant and accurate (World Bank, 2011). According to Estrella and Gaventa (1998), participatory planning enhances ownership and trust, especially in community-based projects such as agricultural interventions.

In Kenya, however, studies have shown that most agricultural projects still rely on top-down approaches to M&E planning. Mutinda and Wambua (2020) found that smallholder farmers were rarely involved in defining indicators or deciding how project outcomes should be measured. This disconnect often leads to misaligned expectations, reduced commitment, and under-utilization of M&E findings.

In the context of donor-funded agricultural projects like Push-Pull, where multiple stakeholders (farmers, project staff, extension officers, and researchers) operate at different levels, inclusive planning becomes even more critical. Participation in M&E planning can bridge the gap between scientific project goals and local farmer realities, increasing the chances of sustainable outcomes (Mbiti et al., 2020).

Stakeholder Engagement in Data Collection for M&E
Stakeholder participation in data collection enhances not only the credibility of M&E data but also promotes transparency and learning. According to Kumar (2016), involving stakeholders in data collection helps build local capacity, reduces misinformation, and improves the accuracy of project reports.

In agricultural projects in Kenya, community-based monitoring mechanisms have been tested with varied success. A study by Owuor et al. (2019) on participatory M&E in Western Kenya revealed that training farmers to use simplified data tools increased their engagement and accountability. However, challenges such as low literacy levels, lack of incentives, and logistical limitations often hinder meaningful participation (Odhiambo, 2022).

Specifically for the Push-Pull project, technical data (e.g., pest suppression, crop yields) must be complemented with community-sourced observations. icipe (2020) emphasizes that successful scaling of the technology depends on how well farmers can document and share localized information. Therefore, mechanisms that promote farmer participation in data collection—such as farmer field schools and participatory rural appraisal tools—are essential for effective M&E in Homa Bay and similar contexts.

Sharing and Utilization of M&E Results Among Stakeholders
The final and often overlooked phase of M&E is the dissemination and use of evaluation results. Meaningful stakeholder participation in this stage ensures that findings inform real-time decision-making, adaptive project management, and community learning (Patton, 2011). However, many agricultural M&E systems fail to adequately engage stakeholders in interpreting or applying results (IFAD, 2021).

Research by Maina and Njoroge (2021) on livestock projects in Kenya found that while data was collected regularly, feedback loops to farmers were weak, leading to missed opportunities for improvement. Similarly, Mutua (2020) observed that project staff often treat M&E reports as donor compliance tools rather than learning resources for local actors.

For the Push-Pull project, M&E findings on adoption rates, crop performance, and training impact need to be shared with farmers in user-friendly formats—such as visual dashboards, local barazas, or mobile alerts. When stakeholders receive timely, relevant feedback, they are more likely to engage, adapt practices, and sustain innovations (icipe, 2021).

While literature affirms the value of participatory M&E in agricultural development, there is limited empirical data on how stakeholders are involved across all M&E phases—especially in localized interventions like the Push-Pull project in Homa Bay County. Most studies emphasize participation in either data collection or community sensitization, leaving gaps in understanding of stakeholder influence in M&E planning and feedback mechanisms.

This study contributes to filling that gap by assessing stakeholder participation holistically—from planning, through data collection, to the sharing of M&E results—within the Push-Pull agricultural project context in Kenya.

IV. RESEARCH DESIGN

This study adopted a descriptive cross-sectional research design. The descriptive design was chosen

because it allows for the systematic collection and analysis of both qualitative and quantitative data to describe the current state of stakeholder participation in monitoring and evaluation (M&E) of the Push-Pull agricultural project. A cross-sectional approach was appropriate as it enabled the researcher to gather data from different stakeholder groups at a single point in time, thus providing a snapshot of participation levels across various phases of the M&E cycle.

This design is effective in exploring perceptions, experiences, and levels of involvement in M&E activities such as planning, data collection, and dissemination of results. It also allows for comparison across different stakeholder categories, including farmers, technical project staff, and extension officers.

A chi-square test of independence was performed to assess the relationship between stakeholder involvement in data collection, participation in M&E planning, mechanisms and extent of sharing M&E results and their overall participation in M&E of the Push-Pull technology.

V. RESULTS

This chapter presents the findings of the study based on the three research objectives. The results are organized into three main sections: stakeholder participation in M&E planning, involvement in data collection, and mechanisms of sharing M&E results. Both quantitative data (from 201 survey respondents) and qualitative insights (from FGDs and KIIs) are included to enrich the interpretation.

Objective 1 Stakeholder participation in M&E planning

Response	Frequency (n=201)	Percentage (%)
Actively involved	41	20.4
Occasionally involved	53	26.4
Not involved at all	107	53.2

Most farmers reported they were not involved in designing indicators or setting M&E timelines. FGDs revealed that planning meetings were often held in urban centers, limiting grassroots participation.

"We are told to give feedback, but no one asks us when the project goals are set or how to measure success." – Farmer, Ndhiwa Sub- County
"Planning is often centralized at the NGO level. Farmers mainly come in during implementation." – KII, Extension Officer.

FGDs revealed that planning meetings were often held in urban centers, limiting grassroots participation. This completes the entire process required for widespread of research work on open front.

A chi-square test of independence was performed to evaluate the relationship between stakeholder participation in monitoring and evaluation (M&E) planning and their overall engagement in M&E activities related to the performance of Push-Pull technology. The test indicated a statistically significant association, $\chi^2(1, N = 201) = 25.77$, $p < .001$.

Stakeholders who were involved in M&E planning were significantly more likely to report high participation in M&E overall. This finding highlights the importance of early-stage engagement in enhancing stakeholder ownership and sustained involvement throughout the project lifecycle, echoing insights from Musomba, Mwaura, and Wambugu (2020).

Objective 2 Stakeholders involvement in data collection

Activity Involved In	Yes (%)	No (%)
Filling monitoring forms	28.9	71.1
Attending field assessments	42.3	57.7
Reporting issues to field staff	50.7	49.3

Results indicated farmers contributed mostly through verbal reports and field day observations, rather than structured data tools. Only 31% had received any training related to monitoring activities. Common challenges: literacy barriers, lack of tools, and unclear data use purpose.

"They come with forms and ask us to answer, but we don't understand the questions. We just give rough information." – FGD, Mbita

A chi-square test of independence was conducted to assess the association between stakeholders' involvement in data collection and their level of participation in monitoring and evaluation (M&E) of Push-Pull technology performance. The result revealed a statistically significant association, $\chi^2(1, N = 201) = 33.69, p < .001$.

Stakeholders who were actively involved in data collection were significantly more likely to report high participation in the overall M&E of the Push-Pull project compared to those not involved in data collection. This supports existing evidence that field-level engagement strengthens ownership and commitment to M&E processes (Nganga et al., 2021).

Objective 3: Mechanisms and Extent of Sharing M&E Results

Method of Feedback	Frequency (%)
Verbal during farm visits	40.8
Community barazas	24.9
Printed reports	8.9
No feedback received	25.4

Over a quarter of respondents said they never received feedback on project monitoring results. Only 36% reported that M&E findings had ever influenced their farming decisions. Reasons included delayed communication and lack of relevance to small-scale farmers. *"We hear about yields and pest control success, but it's after the season ends."* – Farmer, Homa Bay Sub- County. The result revealed it was not statistically significant association with performance of Push-pull project.

VI. DISCUSSION

This chapter interprets and contextualizes the study's findings in relation to the research objectives and existing literature. It critically analyzes how stakeholder participation in M&E planning, data collection, and results dissemination influences project performance and timely decision-making in the Push-Pull agricultural project.

Stakeholder Participation in M&E Planning

The study found that 53.2% of stakeholders were not involved in M&E planning, while only 20.4% reported active involvement. This limited participation suggests a top-down approach to M&E, where decisions are made by project implementers without consulting key local actors—especially smallholder farmers.

This supports Musomba et al. (2020), who observed that many agricultural projects in Kenya marginalize farmers during M&E design stages, leading to poor indicator alignment and lack of ownership. Moreover, the qualitative insights confirmed that most planning occurs in urban centers, further excluding rural stakeholders due to logistical and communication barriers.

Limited planning participation affects the relevance and usability of M&E indicators and restricts farmers' capacity to engage with the evaluation results meaningfully. As a result, stakeholders are less motivated to contribute or trust the M&E process, reducing the quality and timeliness of feedback loops.

Stakeholder Engagement in Data Collection

Although participation was relatively better during data collection, the quality of engagement was still weak. For instance, while 50.7% reported informing field staff of issues, only 28.9% had ever filled monitoring forms. Additionally, just 31% had received any form of M&E training.

This aligns with findings by Nganga et al. (2021), who noted that although farmers often contribute observational data, the lack of structured training and tools results in inconsistent and unreliable information. The findings also echo Oduro & Baah (2019), who reported that in many rural agricultural projects, farmers are used as informal data sources but are not empowered as active M&E agents.

The lack of training and clear communication on data usage further undermines the value of participatory monitoring. As indicated in FGDs, some farmers

"just give rough information" because they don't understand the questions—leading to data quality issues and delays in decision-making.

Mechanisms and Extent of Sharing M&E Results

The study found that 25.4% of respondents had never received feedback on project results, while only 36% reported that M&E findings had influenced their farming decisions. Feedback mechanisms relied heavily on verbal communication during farm visits (40.8%) and community barazas (24.9%), with minimal use of printed or digital reports.

These findings confirm previous research by the World Bank (2020), which noted that feedback systems in rural development projects are often informal, inconsistent, and delayed, making them ineffective for learning and improvement. Additionally, Mude et al. (2022) emphasized the role of weak ICT infrastructure and poor extension services in slowing down data flow in rural Kenya.

The absence of timely, actionable feedback reduces the value of M&E systems, as farmers cannot adjust practices mid-season. This contributes to suboptimal project performance, particularly in interventions like Push-Pull that depend on synchronized activities (e.g., planting desmodium, timing maize sowing, managing pests).

CONCLUSION

This chapter presents the overall conclusion of the study based on its three objectives. It reflects on how stakeholder participation in the M&E of the Push-Pull agricultural project affects project performance, learning, and sustainability. The chapter draws from both quantitative and qualitative findings, as well as scholarly literature.

This study assessed stakeholder participation in monitoring and evaluation of the Push-Pull agricultural project in Homa Bay County, Kenya, focusing on planning, data collection, and results dissemination processes. The findings indicate that stakeholder participation, though acknowledged in theory, is inconsistently applied in practice.

Firstly, the study found that participation in M&E planning was minimal, with over 53% of respondents reporting no involvement. Planning was often conducted by implementing NGOs and extension officers without meaningful engagement of smallholder farmers. This aligns with Musomba et al. (2020), who noted that centralized planning leads to weak ownership and misaligned performance indicators in agricultural projects.

Secondly, stakeholder participation in data collection was present but superficial. While many farmers provided observational inputs, few had access to formal data tools or M&E training. This limited capacity undermines data quality and reduces the effectiveness of participatory M&E systems. Similar patterns were observed by Nganga et al. (2021), who emphasized that successful participatory monitoring must be accompanied by local training and empowerment.

Thirdly, mechanisms for sharing M&E results were underdeveloped and inconsistent. About 25% of respondents reported never receiving feedback, while the majority received verbal updates that were often delayed. This limits the learning function of M&E and weakens adaptive decision-making. Oduro and Baah (2019) stressed that without timely and accessible feedback, stakeholder engagement becomes symbolic rather than functional.

Across the three areas, Despite the significance in participation in planning and data collection with $\chi^2(1, N = 201) = 25.77$, $p < .001$ and $\chi^2(1, N = 201) = 33.69$, $p < .001$ respectively the study confirmed that current M&E practices in the Push-Pull project reflect a donor-driven model with limited local ownership, which may compromise the long-term success and scalability of the technology. Mude et al. (2022) argue that for agricultural innovations to succeed in rural contexts, M&E systems must be grounded in the local realities of end users.

In conclusion, the study underscores the need for a shift toward farmer-centered M&E systems that emphasize inclusive planning, capacity building for data collection, and robust, timely feedback mechanisms. This would enhance accountability, strengthen learning loops, and improve project performance.

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