



**MONITORING AND EVALUATION SYSTEM RESILIENCE
AND ITS INFLUENCE ON DEVELOPMENT PROGRAM
DECISIONS: EVIDENCE FROM NON-GOVERNMENTAL
ORGANIZATIONS IN NAIROBI, KENYA**

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Abstract

Effective decision-making during the design, appraisal, and implementation of development programs is to an extent influenced by information generated from monitoring and evaluation (M&E) systems. Considerable efforts are thus needed to identify and strengthen sub-dimensions of M&E system resilience to ensure that non-governmental organizations (NGOs) advance their decision-making capabilities. This research examines sub-dimensions of M&E system resilience among NGOs in Nairobi and their influence on development program decision-making. Results should assist NGOs to build and manage effective M&E systems that meaningfully support management decision-making. A partially mixed concurrent equal status research design was adopted. A sample size of 348 local, national and international NGOs was targeted to be included in the study. Using a stratified and simple random sampling approach, 254 respondents participated in the quantitative survey research while 17 participated in key

informant interview. Data was collected between March and April, 2019. The study found that resilient M&E systems explained 41 percent of the variance of improved development program decision-making. 58 percent of NGOs with resilient M&E systems used M&E information and data even after program closure for post evaluations initiatives. It is thus important for NGOs to set up, operate, and maintain resilient M&E systems, given the positive relationship a resilient M&E system has with improved proficiencies to make effective program decisions. NGOs should setup and maintain resilient M&E systems whose services supersede project lifespans and are not adversely subject to employee turn-over.

Keywords: Decision-making, Monitoring, Evaluation, Non-Governmental Organizations, Resilience, Development

INTRODUCTION

Effective decision-making during the design, appraisal, and implementation of development programs is to an extent influenced by information generated from monitoring and evaluation (M&E) systems. In a context where Non-Governmental Organizations (NGOs) implement time-bound development interventions, M&E systems are often considered as intermittent efforts tagged to specific projects. Hence, development practitioners today are limited in designing and managing M&E systems capable of safeguarding longevity and utility of M&E information beyond project life-span. Too often, organizations have inadequate capacity or motivation to sustain M&E systems in the absence of project inputs, especially external financial support (Görgens & Kusek, 2009).

Despite expanding literature and research on M&E, its nexus to operational, tactical and strategic decision-making practices among development agencies is not much recognized and understood (Lopez-Acevedo, Krause, & Mackay, 2012; Yıldız, 2015; Rademeyer & Lubinsky, 2017). Furthermore, the resilience of M&E systems as a key component of M&E service quality still remains numinous to development practitioners. Thus far, in spite of the increased appreciation of M&E, there is limited grasp of the measurable influence of M&E sustainability on development program managerial decision making (BA, 2019). In addition, the literature on M&E has conventionally been more inclined towards explicit knowledge of M&E concepts rather than internalization of both tacit and explicit M&E knowledge rooted in M&E action, procedures and practice (Nonaka, Toyama, & Konno, 2000). As an outcome, the literature on M&E is rich, but does not adequately address the particulars of M&E system resilience as it relates to NGO decision-making practice (The Institute for Inclusive Security, 2014).

The use of M&E information and evidence for development program decision-making is fundamental to the resilience of an M&E system (Lopez-Acevedo, Krause, & Mackay, 2012). If information is not fully applied, then the overall efficiency of the M&E system is curtailed. For the M&E system to be resilient, then its scope and objectives must be planned appropriately, managed efficiently, utilized optimally, and resourced adequately. Strengthening the technical capacity of adequate human resources is also an important aspect to ensure M&E system sustainability (Lahey, 2010). Instead of merely setting up M&E systems that ensure accountability to donor funded M&E activities (Mackay, 2008), NGOs should design and manage M&E systems that transcend this conventional expectation. This research adopted an M&E System effectiveness framework developed by BA in a research published in 2019 on M&E Systems in West-African Countries. BA found that the ability of M&E system to remain fully functional albeit major changes occurring during the development project lifecycle is a key measure of system sustainability (BA, 2019). Therefore, each dimension of M&E system resilience: capacity of the M&E-System to remain fully functional when major changes occur in the M&E team; capacity of the M&E decentralized units to be functional with minimum supervision and support; capacity of the program managers and other stakeholders to access M&E information with minimum support from the M&E team; and utility of the M&E data after program closure for programming and capitalization purposes needs regular consideration over time to guarantee system resiliency (BA, 2019).

It is more and more evident that beyond significant changes within the project teams, it's critical for NGOs to meaningfully benefit from M&E systems beyond project lifespan, to ensure full functionality and net benefits amidst project risks and fluctuations (BA, 2019). Considerable efforts are thus needed to identify and strengthen the sub-dimensions of M&E system resilience to ensure that NGOs advance their decision-making capabilities. While many academic researchers have acknowledged the gravity of M&E systems in supporting decision-making within development programs, available literature is not quite detailed on M&E system resilience and its interface with decision-making processes and practices. Subsequently, we have an inadequate depiction of the way M&E systems among NGOs are structured to drive system resilience.

Against this background, this research examined sub-dimensions of M&E system resilience among NGOs in Nairobi and their influence on utilization of M&E information for development program decision-making. More specifically, the research aims to achieve two specific research objectives: Firstly, to determine ways in which resilience of M&E systems influence development program decision-making among NGOs in Nairobi; and secondly, to identify which sub-dimensions of M&E system resilience are more effective in improving development program decision-making across the three types of NGOs (Local, National and International).

LITERATURE REVIEW

The foundation for this research was the existing literature on the inter-relationships among core dimensions of M&E system resilience, especially the 'capability of M&E system to remain fully functional when significant changes occur in the M&E team' and 'capability of program managers and other stakeholders to access M&E information with minimum support from the M&E team.' There are four core sub-dimensions in this literature and a general model of their conceivable interrelationships is shown in Figure 1. This model will be elucidated next, starting with the four core measures of a resilient M&E system, before moving on to their influence on M&E system resilience.

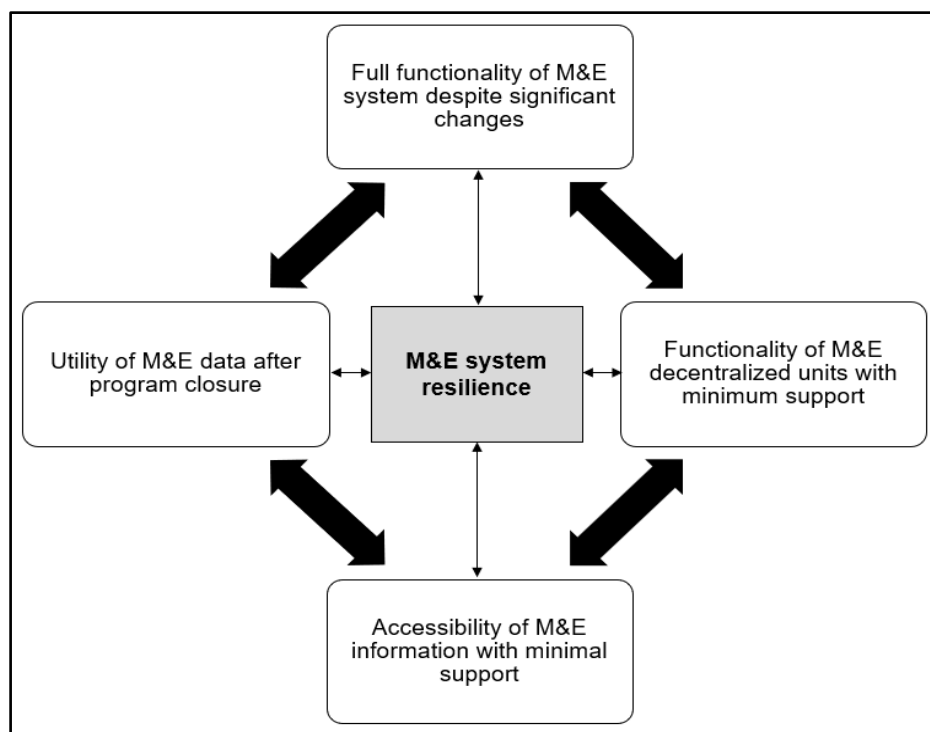


Figure 1: Influencers of the relationship among core sub-dimensions of M&E system resilience

Source: Authors' Compilation (2019)

This research espoused an M&E System effectiveness framework developed by BA in a book published in 2019 on M&E Systems in West-African Countries. According to BA (2019), each dimension of M&E system resilience: capacity of the M&E-system to remain fully functional when major changes occur in the M&E team; capacity of the M&E decentralized units to be functional with minimum supervision and support; capacity of the program managers and other stakeholders to access M&E information with minimum support from the M&E team; and utility

of the M&E data after program closure for programming and capitalization purposes needs regular consideration over time to guarantee system resiliency.

Resilience of M&E is concerned with the capabilities of the system to endure substantial changes in program operations and to uninterruptedly satisfy the needs of potential M&E information users (Lopez-Acevedo, Krause, & Mackay, 2012). In order to facilitate M&E system resilience, the World Bank (2017) proposed the increased application of systematic and robust approaches such as balancing indicator ambition with practicality, securing resources needed for robust M&E and undertaking evidence-based learning throughout the project life cycle. Görgens & Kusek (2009) posited that the utilization of information, clear scope and objectives, technical capacity, incentives, accountability needs regular consideration over time to guarantee M&E system resilience.

In this research, M&E system resilience is used interchangeably with M&E system sustainability, and is perceived as a multidimensional construct consisting of four measures: the ability of the M&E system to remain fully functional when significant changes occur in the M&E team; ease of access of M&E system with minimum supervision; and support and the utility of M&E data after program closure. When the outputs (data and information) of M&E systems are highly utilized including during program life and beyond program closure, while at the same time able to withstand significant variations during program life, then the system is considered to be *resilient* or *sustainable* (BA, 2019; Mackay, 2008)

Although research on M&E system resilience is scant, there is both theoretical and empirical appreciation for the need to set-up, manage and maintain M&E systems that support improved development program decision making. The prospect theory, developed by Daniel Kahneman and Amos Tversky in 1979 explains managerial decision making under risk or uncertainty. This theory makes the assumption that decision makers are not always rational and may therefore make ineffective decisions when framing and valuing contingencies and possible decision outcomes. Resilient M&E systems thus bridge this rationality gap by catalysing the provision of verifiable data and evidence to support decision making under risks and uncertainty.

It is crucial to also recognize that it takes time and resources to create and strengthen M&E systems. As observed by Lopez-Acevedo, Krause, & Mackay, one major aspect of ensuring that M&E information is accessible with minimum support is to train decision makers and M&E technical staff on the use of M&E information so that they can adequately utilize evidence in their day-to-day work. This then complements the indefinite survival of M&E systems (Lopez-Acevedo, Krause, & Mackay, 2012). However, Görgens & Kusek (2009) note that there is a scarcity of skilled M&E professionals as well as absence of harmonized training

courses and technical advice on M&E. Thus, capacity building of the core stakeholders involved in the M&E system is therefore key to ensure effective participation and to support optimal utilization of M&E information (Wao *et al*, 2017; Lahey, 2015). This, therefore, suggests the necessity for closer coordination between producers and users of M&E data along the entire continuum of collecting, aggregating, analysing, sharing, and interpreting M&E data for improved decision-making.

Changes in teams, program designs, and cultures are imminent during implementation of development programs. The full functionality of M&E systems is thus subject to these program changes. Changes could range from cosmetic to deep and therefore capability of M&E systems to withstand changes within the program is a critical measure of M&E system resilience (BA, 2019). Poorly-functioning M&E systems suffer fluctuations which ultimately compromise effectiveness when program staff change (Lopez-Acevedo, Krause, & Mackay, 2012).

The utility of M&E information can be viewed as mainstreaming of M&E functions within the organization (Mackay, 2008). By taking up constructive steps to design and increasingly refine M&E systems, Mackay (2008) observes that proper utilization M&E information can contribute to improved management decision making, policy development and accountability. The value of M&E is thus not derived from conducting M&E activities but from making the information available and accessible to help improve performance and achievement of development objectives. The resilience of M&E system is thereby catalysed by intensive utilization of M&E information.

Establishment of functional decentralized systems to facilitate data collection, processing and ongoing reporting on development program performance with minimal support from headquarters is also important to ensuring that M&E systems are resilient. Based on the aforementioned discussion, it is therefore, posited that M&E system resilience plays a key role on development program decision-making within local, national and international NGOs.

METHODOLOGY

The research adopted an M&E System effectiveness framework developed by Ba (2019), to assess M&E practices from NGOs based in Nairobi. We employed a partially mixed concurrent equal status research design (Leech & Onwuegbuzie, 2009). *Partially mixed* implies quantitative and qualitative findings were integrated after completion of data analysis; *concurrent* implies quantitative and qualitative data were collected concurrently, and *equal status* implies that both quantitative and qualitative data were accorded equal weight in addressing the research questions (Wao *et al*, 2017).

Descriptive correlational research design was employed within the quantitative research component to research the relationship between M&E System Resilience and managerial decision-making among NGOs while a *survey research design* was adopted to gather in-depth feedback from key informants on the experience of the various NGOs regarding the variables of interest. Qualitative feedback generated from structured Key Informant Interviews (KIIs) were synthesized and integrated with quantitative findings to paint a whole picture of the research outputs. Triangulation of data from literature review results also helped enhance the quality and significance of the research findings. The two core research questions that guided the study included: Firstly, is there a difference in the resilience of M&E systems within local, national and international NGOs? Secondly, which sub-dimensions of M&E system resilience were more effective in improving development program decision-making within NGOs?

Data for this research were collected as a subset of a larger Master of Development Studies (MDS) dissertation, *Effects of Monitoring and Evaluation systems on Managerial decision-making among Non-governmental Organizations in Nairobi County, Kenya*, whose purpose was to find the effects of M&E systems (specifically M&E information availability and accessibility, M&E system responsiveness and sustainability) on managerial decision-making among NGOs in Nairobi. The first author was a St. Paul's University MDS candidate, the second and third authors were MDS research supervisors. The study adopted a stratified and simple random sampling approach. Out of the estimated 2,683 NGOs registered to operate in Nairobi by the NGO Coordination Board (Nairobi City County, 2017), a target sample size of 348 NGOs were sampled through the simplified Yamane formula with known confidence (95%) and risks (0.05) levels and targeted to be included in the quantitative survey. The target population was divided into strata and a random selection was adopted in each subgroup (Taherdoost, 2016). NGOs were then selected randomly from each of the strata namely; International NGOs (focused on cross-country programs), National NGOs (focused on nation/country-wide programs) and Local NGOs (focused on specific programs carried out exclusively within Nairobi only). At NGO level, participants were selected purposively considering their role in M&E and in the decision-making processes in the various organizations. The units of analysis were M&E Technical and management staff involved in various development projects.

Data for the main study was collected between March 18, 2019 to April 8, 2019, with Paper-based surveys being administered by trained interviewers to over 348 NGOs operating in Nairobi. An online survey on SurveyMonkey platform was also administered, with participants being selected based on the research criteria described above. Follow-up emails were sent to respondents who had not returned their surveys within the one-month data collection window. To boost response rates on the quantitative research component, a multimode approach

(allowing for differing methods of returning surveys) was used to administer both paper-based questionnaires and online questionnaires. The research adopted a survey questionnaire developed by Ba (2019) including benchmarks with clear description of the highest value (5) of the scales was adopted. The utilization of this benchmarking approach provided assurance that the Likert scales were applied consistently to ensure the reliability of scores selected and minimum subjectivity in the responses. Data collection instruments were pilot-tested in the field where instruments were administered the same way it was done in the main study. A small-scale trial run of all the procedures planned (data collection protocols) for use in the main study was done in one target NGO. NGO's used for pretesting were not included as part of the main study. Minor typing errors were identified and amended on the survey questionnaire. No issues were noted on the KII guidelines.

Statements related to resilience of M&E systems in supporting development program decision-making capabilities within the NGOs were assessed by having participants rate the extent to which they agreed or disagreed with the benchmarked sub-dimensions, using a 5-point rating scale (1 = "strongly disagree" to 5 = "strongly agree"). A reliability test was performed on four M&E system resilience items using Cronbach Alpha method to yield a mean of 14.31, variance of 8.862, standard deviation of 2.98 and coefficient of .734 indicating acceptable internal consistency reliability with our sample as presented in Table 1.

Table 1: Item Statistics

Items	Mean	St. Deviation	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1) The M&E system remains fully functional when significant changes occur in the M&E team.	3.74	.951	10.57	5.116	.660	.597
2) M&E decentralized units are functional with minimum supervision and support.	3.52	.985	10.79	5.496	.519	.678
3) Program managers and other stakeholders can access M&E information with minimum support from the M&E team	3.27	1.013	11.04	5.303	.543	.664
4) M&E data and information is used after program closure	3.78	1.040	10.53	5.792	.397	.749

We performed basic descriptive analysis (frequencies, percentages and correlation analysis), and inferential analysis (Analyses of variance and regression analysis) to generate robust and unbiased findings. Specifically, correlation analyses were conducted to determine ways in which resilience of M&E systems influence managerial decision-making among NGOs. We run regression analysis to establish and test influence of sub-dimensions of M&E System resilience on operational, tactical and strategic decision-making among NGOs.

The qualitative component focusing on M&E system resilience involved open-ended questions requiring participants to state one significant thing about M&E and decision-making process, stages in the program cycle when data was most useful (and why), extent to which evaluations improved program work (and why), extent to which evidence and information gathered from M&E systems was used in the decision-making process and, recommendations on what could be done to make M&E systems more beneficial to organizational users as well as what could be done to improve decision making in the NGO programs. Thematic content analysis of qualitative feedback from KIIs using constant comparison technique was also conducted.

ANALYSIS AND RESULTS

A total of 254 participants (43% M&E technical and 57% program management staff) from three types of NGOs participated in the quantitative survey (Local NGO 24%, National NGO 33% and International NGO 43%). We gathered in-depth qualitative insights from 17 Key Informants (including technical and program management staff), each taking about 40 minutes. The 17 KIIs was considered adequate since the sample fell within the prescribed range of 15-30 interviews (Marshall, Cardon, Poddar, & Fontenot, 2013). Interviews were conducted continually until the data set was complete and data saturation point was reached.

Influence of M&E system resilience on development program decision-making within local, national and international NGOs

Lopez-Acevedo, Krause, and Mackay (2012) assert that a successful M&E system is able to survive changes in NGO staffing. Slightly over one-half (58%) of the survey participants reported that their M&E systems were resilient in supporting managerial decision making. This infers that the functionality of nearly half of the NGOs' M&E systems was not sufficiently resilient to withstand substantial changes taking place within the M&E team. In concurrence with this quantitative finding, a key informant said;

“Our M&E system is not effective as staff have not embraced its full use and potential. As much as relevant information is updated and keyed into the M&E Enterprise

Resource Planning (ERP) information system, staff keep leaving the organization, draining the institutional memory. There is a risk of losing out as a result of staff turnover when staff leave."(KII 14, 2019)

As such, in order to enhance continued utility and resilience of the M&E system, knowledge and information sharing practices within NGOs need to be revised and modified, to allow new staff enlisted into M&E teams to sufficiently acquaint themselves with already established M&E systems. This way, the transition of M&E technical staff will be smoothed. In addition, organizations won't have to re-invent the wheel by developing new M&E tools and protocols as new staff are recruited, but rather NGOs will learn and build on existing systems. The study also established a need for M&E Technical Staff (suppliers of M&E products) to train program staff (users of M&E products) on M&E systems while adopting among others the short course strategy to build capacity of staff in M&E (Wao *et al*, 2017). The training of non-M&E staff on M&E will not only strengthen the optimal accrual of benefits from the M&E systems but also advance system resilience.

Table 2: Sub-dimensions of M&E System Resilience ($n=254$)

Sub-dimensions of M&E System Resilience	DS+D %	DS %	D %	N %	A %	AS %	A+AS %
1) The M&E system remains fully functional when significant changes occur in the M&E team.	12	0	12	26	39	24	62
2) M&E decentralized units are functional with minimum supervision and support.	16	2	14	30	39	16	54
3) Program managers and other stakeholders can access M&E information with minimum support from the M&E team	28	2	26	26	37	10	46
4) M&E data and information is used after program closure	16	2	14	14	45	26	70
Average	18	2	16	24	40	19	58

n =number of participants; **DS** = Disagree Strongly; **D** = Disagree; **N** = Neutral; **A** = Agree; **AS** = Agree Strongly

M&E team. This implied that more one-half of decision makers within NGOs had difficulty understanding, interpreting and utilizing M&E data without support from the M&E technical staff. Although nearly one-half (54%) of the survey participants observed that their M&E decentralized units were functional with minimum supportive supervision, most M&E decentralized (field level) units were unable to be completely functional without supervision from the NGO headquarters. This implied that most NGOs were incapable of gathering high-quality data and information that meet the essentials of data quality standards at any time during the program lifetime.

Lopez-Acevedo, Krause, and Mackay (2012) acknowledged an effective M&E system as one whose products and services are applied over a sustained period of time. Majority (70%) of the survey participants stated that M&E information and data was used even after program closure. This finding points towards the recognition of the crucial role of M&E data and information for post evaluations initiatives (including *inter alia* resource mobilization, development program target setting and as baseline for future programming). Consistent with this survey finding, a KII respondent said;

“Evaluations reports have helped in informing programs/project design, quality reporting and in informing decision making. The benefits of evaluations are however not fully exploited.” (KII 5, 2019)

The overall rate of improved development program decision making attributable to the effective program M&E systems was 68% for the combined sample of NGOs represented in the survey (Improved operational decision making 69%, improved tactical decision making 63%, and improved strategic decision making 72%). Improved operational decision making attributable to the M&E system effectiveness was highest within International NGOs (43%) and lowest (23%) among local organizations as shown in the Figure 2. This finding was closely replicated on aspects of enhanced strategic and tactical decision-making. NGOs cited improved strategic and tactical decision-making with irrefutable and concrete evidence showing presence of strategic and tactical decision-making improvements in the development program or inside the NGOs attributable to effective program M&E systems.

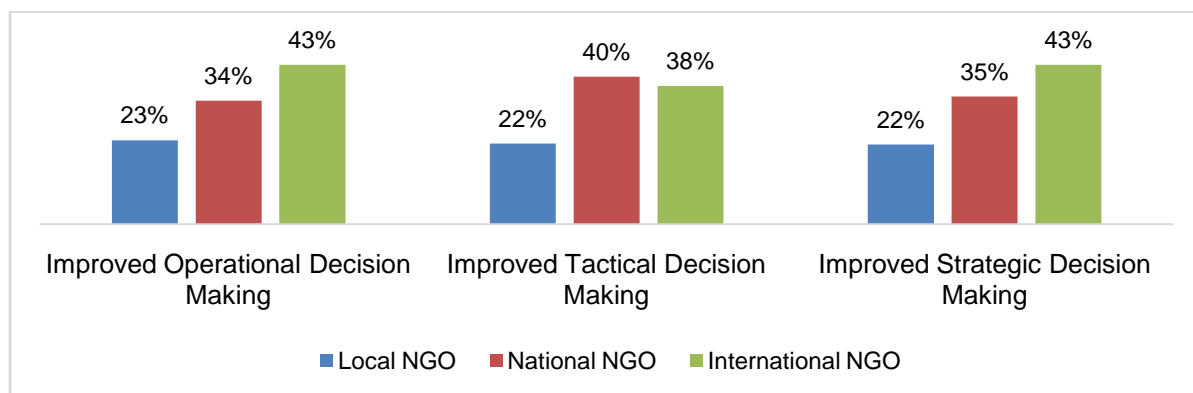


Figure 2: Improved development program decision-making across categories of NGOs (n=254)

We sought to find whether there were differences in improved strategic, tactical and operational decision-making scores attributable to M&E systems for local, national and international NGOs. Firstly, a one-way between-groups analysis of variance was conducted to explore the impact of M&E systems on improved strategic decision-making, as measured by the Life Orientation test

(LOT). Participants were divided into three groups according to type of NGO (Figure 1: local NGOs; Group 2: national NGOs; Group 3: International NGO). There was no statistically significant difference at the $p < .05$ level in improved strategic decision-making scores for the three categories of NGOs [$F(2,251) = .620, p = .539$]. Secondly, the same steps described in step 1 were followed to explore the impact of M&E systems on improved tactical decision-making. There was a statistical significant difference at the $p < .05$ level in improved tactical decision-making for the three categories of NGOs [$F(2,251) = 3.709, p = .026$]. Despite reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was .03. Post-hoc comparisons using the Turkey HSD test indicated that the mean score for Group 3: International NGOs ($M = 3.55, SD = 1.084$) was significantly different from Group 2: national NGOs ($M = 3.93, SD = .949$). Group 1: Local NGOs ($M = 3.75, SD = .728$) did not differ significantly from either Group 1 or 3. Thirdly, we applied similar procedure used in Step 1 to explore the impact of M&E systems on improved operational decision-making. There was no statistically significant difference at the $p < .05$ level in improved operational decision-making scores for the three categories of NGOs [$F(2,251) = 1.925, p = .148$].

Effectiveness of sub-dimensions of M&E system resilience in improving development program decision-making

To identify and examine which sub-dimensions of M&E system resilience were more effective in improving decision-making across the three categories of NGOs, we investigated the links amongst the four sub-dimensions of M&E system resilience presented in Table 3, using Pearson product-moment correlation coefficient.

Table 3: Matrix of correlation of measurements of M&E System Resilience ($n = 254$)

	1) M&E system remains fully functional when significant changes occur in the M&E team.	2) M&E decentralized units are functional with minimum supervision and support.	3) Program managers and other stakeholders can access M&E information with minimum support from the M&E team	4) M&E data and information is used after program closure
2) M&E decentralized units are functional with minimum supervision and support.	.487**	1		

3) Program managers and other stakeholders can access M&E information with minimum support from the M&E team	.585**	.426**	1	
4) M&E data and information is used after program closure	.405**	.309**	.263**	1

Table 3...

**Correlation is significant at the 0.05 level (2-tailed)

We initially scrutinized the dataset to check that there were no violations to the assumptions of normality, linearity and homoscedasticity. As the outputs in Table 3 show, a medium strength positive correlation was found between the sub-dimension 'Capability of M&E system to remain fully functional when significant changes occur in the M&E team' and 'capability of program managers and other stakeholders to access M&E information with minimum support from the M&E team.' ($r=0.58$). The other correlations were not adequately significant and thus M&E resilience was captured through the two key sub-dimensions, 'Capability of M&E system to remain fully functional when significant changes occur in the M&E team' and 'capability of program managers and other stakeholders to access M&E information with minimum support from the M&E team.'

Next, we sought to find whether there were differences in the use of M&E data after the closure of development programs within local, national and international NGOs. A one-way between-groups analysis of variance was conducted, as measured by the Life Orientation test (LOT). Participants were divided into three groups according to type of NGO (Group 1: local NGOs; Group 2: national NGOs; Group 3: International NGO). There was a statistical significant difference at the $p<.05$ level in the use of M&E data after development program closure for the three categories of NGOs [$F(2,251)=3.974$, $p=.020$]. Despite reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was .03. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Group 1: local NGOs ($M=3.50$, $SD=.966$) was significantly different from Group 2: national NGOs ($M=3.99$, $SD=.852$). Group 3: International NGOs ($M=3.77$, $SD=1.176$) did not differ significantly from either Group 1 or 2.

Finally, we examined the influence of the four sub-dimensions of a sustainable M&E system presented in Figure 3.

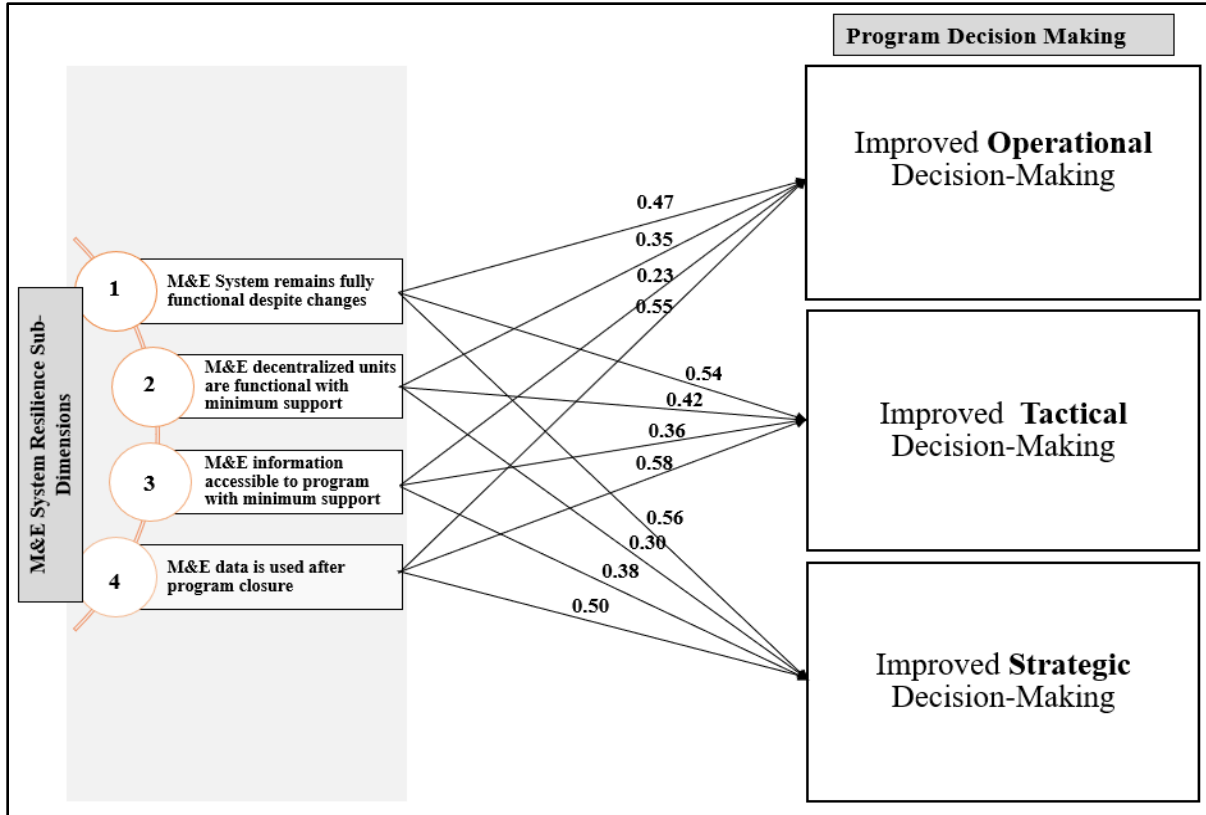


Figure 3: Effects of M&E system resilience sub-dimensions with quantified coefficients on development program decision-making (n=254)

Equation Model:

$$\text{Program Decision-Making} = 1.469 + 0.365 \cdot \text{FC} + 0.026 \cdot \text{MinSD} + 0.060 \cdot \text{MinSM\&E} + 0.264 \cdot \text{UIFC}$$

Table 4: Influence of explanatory variables

	Coefficient	Standard coefficient
Constant	1.469	
M&E System remains fully functional despite changes. (FC)	.365	.408
M&E decentralized units are functional with minimum support. (MinSD)	.026	.030
M&E information accessible to program with minimum support. (MinSM&E)	.060	.071
M&E data is used after program closure. (UIFC)	.264	.323

Quality of estimate:

The model accounts for **41%** of the variance of the variable to be explained.

Coefficient of the multiple correlation: $R = \mathbf{0.640}$.

P-value of R: $p(R) = \mathbf{<0.01}$.

The model composed of 'M&E System remains fully functional despite changes', 'M&E decentralized units are functional with minimum support', 'M&E information is accessible to program team with minimum support', and 'M&E data is used after program closure' explained 41% of the variance of development program decision-making. The coefficient of multiple correlations (R) also displayed a good model. The quantified coefficients disclosed that managerial decision-making was greatly influenced by two key measurements; 1) capacity for the system to endure substantial fluctuations in the M&E team and 2) post-programmatic usage of M&E data and information. The results suggest that two key measurements, 'capacity for the system to endure substantial fluctuations in the M&E team and, 'post-programmatic usage of M&E data and information' are significant contributors to effectiveness of M&E system resilience in improving development program operational, tactical and strategic decision-making.

CONCLUSION AND DISCUSSIONS

This research investigated the resilience of M&E systems – in the form of system sub-dimensions – in influencing development program decision-making among NGOs in Nairobi, Kenya. This research strengthens M&E literature by depicting measurable ways in which M&E system resilience within NGOs is structured to drive improved operational, tactical and strategic decision-making processes and practices. Consistent with published research about the critical role of M&E in meaningfully benefiting NGO's decision's (Ba, 2019; Lopez-Acevedo *et al*, 2012; Lahey, 2010; Görgens & Kusek, 2009), our findings show that there was a high overall rate of improved development program decision-making within NGOs attributable to effective program M&E systems. The importance of placing considerable efforts in identifying and strengthening the sub-dimensions of M&E system resilience was thus not a surprise, to ensuring that NGOs advance their decision-making capabilities (Görgens & Kusek, 2009).

Moreover, we found that the functionality of nearly half of the NGOs' M&E systems were not sufficiently sustainable to endure significant changes taking place within the M&E team. As such, in order to enhance continued utility and resilience of M&E systems, knowledge and information sharing practices within NGOs needs to be revised and modified, alongside providing ongoing M&E capacity strengthening (Wao *et al*, 2017; Lahey, 2010), to allow new staff to sufficiently acquaint themselves with already established M&E systems. Our findings were also consistent with those of Lopez-Acevedo, Krause, & Mackay (2012) who argued that

the use of M&E information is fundamental to the sustainability of an M&E system. It emerged that a majority of the NGOs with sustainable M&E systems used M&E information and data even after program closure for post evaluations initiatives. We further investigated whether there were any differences in the use of M&E data after development program closure within local, national and international NGOs. We found a statistically significant difference with respect the use of M&E data after development program closure ($p=.020$) between national NGOs and local NGOs. Although we did not explicitly qualify the differences, a potential explanation might be that national NGOs have more robust M&E systems that yield timely and more reliable information as compared to local NGOs.

The impact of M&E systems on improved operational, tactical and strategic decision-making is consistent with preceding work within various NGOs in West-Africa context (BA, 2019). In a separate analysis, we compared difference in improved strategic, tactical and operational decision-making scores for local, national and international NGOs. We found statistically significant difference with respect to improved tactical decision-making ($p=.026$) between International NGOs and national NGOs. Thus, these finding suggested that program managers and M&E technical staff in international NGOs agreed more strongly that there was improved tactical decision-making attributable to their M&E systems as compared to those in national NGOs. There was no statistically significant difference at the $p<.05$ level in improved operational and strategic decision-making scores with respect to local, national and international NGOs. The fact that that improved operational and strategic decision-making was found not to be significant in local, national and international NGOs might be attributed to the conventional expectations by donors towards grant recipients to set up M&E systems (including strategic and operation plans) as a pre-condition for funding that ensures accountability to donor funded activities (Mackay, 2008).

Finally, our results indicate that the model composed of four M&E system resilience sub-dimensions; 'M&E System remains fully functional despite changes in M&E team', 'M&E decentralized units are functional with minimum support', 'M&E information is accessible to program team with minimum support', and 'M&E data is used after program closure' explained 41% of the variance of development program decision-making. This makes it clear that resilient M&E systems contribute significantly to improved development program decision-making within NGOs. Moreover, our research discloses that two key measurements, 'capacity for the system to endure substantial fluctuations in the M&E team' and 'post-programmatic usage of M&E data and information' were significant contributors to effectiveness of M&E system resilience. This result authenticates the empirical relationship between M&E system resilience and enhanced

development program decision-making processes and practices as postulated by Ba (2019) which explains the pathways to improved managerial decision-making.

Consequently, NGOs should be cognisant of the fact that, while M&E is crucial for among others, program accountability and tracking implementation progress(Mackay, 2008), it is also key for enhancing managerial decision-making capabilities (BA, 2019). It is thus important for NGOs to set up, operate, and maintain sustainable M&E systems, given the positive relationship a sustainable M&E system has with improved proficiencies to make effective development program decisions.

MANAGERIAL IMPLICATIONS

Today, NGOs engaged in various development initiatives recognize the need for M&E systems. Our research shows that resilient M&E systems (that can withstand substantial changes in the M&E team while providing post-programmatic utility for data) are pivotal for improved operational, tactical, and strategic decision-making. As NGOs progressively engage in development program decision-making, efforts should be made to build and manage effective M&E systems whose services supersede project lifespans (Lopez-Acevedo, Krause, & Mackay, 2012) and are not adversely subject to employee turn-over. Subsequently, M&E technical staff should endeavour to provide M&E information that can be readily accessed and understood by the broader program team (development program decision-makers) for development projects to meaningfully benefit from M&E systems. In addition, the capacities of program managers and other stakeholders should be strengthened (Wao *et al*, 2017; Lahey, 2010), so that relevant decision-makers can access M&E information with minimum support from the M&E team. Nevertheless, (Ba, 2019, Wao *et al*, 2017; Lahey, 2010) advocated that M&E capacity building can result to resilient systems if a quality M&E capacity-building plan is systematically implemented as part of a larger M&E strategy. This research offers strong empirical case to advance sustainable M&E systems for improved development program decision-making.

LIMITATIONS AND FUTURE RESEARCH

Geographical and contextual scope presents one of the key limitations of this research. Data was collected cross-sectionally among randomly sampled local, national and international NGOs based in Nairobi, Kenya. Although the sample was considered acceptable, a sample drawn from a wider geographical scope would have allowed us to generalize our findings to NGOs located beyond Nairobi. Secondly, despite conducting systematic reviews on wide literature published on M&E, we found limited information that addresses the particulars of M&E

system resilience as it relates to NGO decision-making practice. Nonetheless, we supplemented this with qualitative information from key informant interviews.

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AUTHORS' CONTRIBUTIONS

Rohin Onyango conceived the original idea for the research and developed the study design, prepared both quantitative and qualitative data, conducted the statistical analysis and wrote the initial draft of the manuscript. Dr. Petronilla Otuya (PhD) and Dr. Wanjugu Wachira (PhD) were academic staff from the Faculty of Social Sciences, who supervised and technically guided the research from its conception through to its completion. All authors contributed meaningfully to the data interpretation, drafting and revision of the manuscript. All authors gave their approval of the final manuscript for publication.

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