

## Research Article

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# Monitoring with social media: Experiences from “integrating” WhatsApp in the M&E system under sweet potato value chain

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**Abstract:** Dealing with multiple stakeholders in agriculture–nutrition projects often makes communication and the collection of quality, reliable, and low-cost data complex and challenging. Communication bureaucracies among stakeholders often lead to delay, distortion, or loss of information along the communication channel. Social networking platforms can facilitate communication and collection of real-time data useful for project monitoring. This article shares our experience in using the WhatsApp platform for communication and collection of additional monitoring data. A WhatsApp platform for project implementers from the ministries of health (100) and agriculture (52) from Bungoma, Busia, Homa Bay, and Migori counties Kenya was formed in September 2016 for sharing additional monitoring data in the form of photos, videos, and texts. Project monitoring-related costs reduced by 51% and collapsing reporting hierarchies reduced information delays, thereby saving time and communication challenges. A shared understanding among different actors on the project’s indicators, reporting timelines, and data collection guidelines improved the quality of continuous monitoring data. However, staff transfer and replacements called for the continuous induction of new entrants to the forum. WhatsApp is a compelling tool in project monitoring to mitigate communication challenges. It offers an opportunity to share information on one platform among different cadres, facilitating collective action in multi-sectoral approach projects.

**Keywords:** technology, agri-nutrition, monitoring, WhatsApp, Sweet potato

## 1 Introduction

Advancement in digital technologies has influenced the way we engage with each other, our work, and the kind of information we share and receive. Decision-making is based on available data at a personal, political, and professional level depending on the capacity and understanding of digital knowledge. This has been made more exciting with the advancement of mobile phone technologies, which have a global penetration of 63.4% (Poushter et al. 2018). In Kenya, mobile penetration is currently estimated at 100%, with 83% of these users having a smartphone (CCK 2018; Nguniri 2018). Access to smartphones has led to a rise in the use of social networking platforms such as Facebook, Twitter, Skype, and recently WhatsApp. These platforms provide means for people of shared interest to interact with the help of Internet connectivity through phones, tablets, or computers despite the distance.

Other than keeping in touch, social networking has been used in more useful and relevant systems to promote products/services, data collection, disseminate health information, agricultural extensions, and charity works. In the health sector, social networking has mainly been used to promote the uptake of health interventions across different segments (Giustini 2006; Green and Hope 2010; Moorhead et al. 2013; Young et al. 2014; Welch et al. 2018). Twitter, for instance, has commonly been used in the health sector for communication between patients, physicians, medical researchers, and other service providers (Cayton 2006; Chretien et al. 2011; Choo et al. 2015; Pershad et al. 2018). Other than connecting and sharing personalized profiles, Facebook has been on the forefront as a source of health information (Cotten 2001; Greene et al. 2011; Nabi et al. 2013; Hale et al. 2014). WhatsApp is widely used by business, personal, and group interactions. Recently, WhatsApp was rated as the most used social networking platform and is used by 30% of the employees in the United States and Western Europe for business (Insights 2018). It is a type of social media instrument that allows one to many forms of discussion and information sharing (Anders and Woodard 2013; Palekar and Sedera 2015).

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It is a preferred communication mode that allows sharing information in different ways, from text-based e-mails to audios, visuals as well as audiovisual, making it a platform that is enriched with information. Furthermore, data sharing is possible anywhere and at any time, even if Internet data requirements are low (Baruah 2012). Therefore, it has a strong potential to be a viable tool for extension-based organizations (Cole and Fernando 2012; Thakur and Chander 2018). Projects can take advantage of these technological developments in their processes and systems, such as monitoring and evaluation (M&E).

Project M&E requires continuous follow-up and obtaining data for decision-making and to inform progress (Umhlaba Services Development 2017). Collection of continuous monitoring data can at times be costly, with the primary cost being staff time and travel to the field to collect data, give either support supervision, or data quality assessments. If not managed well, this cost can eat into other activity budget or in the wake of minimizing such cost, the quality of data collected may be compromised (Aguilar-Escobar *et al.* 2016; Izmailov *et al.* 2016). WhatsApp offers an opportunity and potential to increase its scope of use by incorporating it into the project management system. The platform can be integrated into the M&E system and processes to improve the timeliness and accuracy of the information collected and disseminated. This application is readily available among smartphone users across the country. Current status indicates the WhatsApp adoption rate was 74% for Kenyans, meaning many actors are existing users or have access to it (Karapanos *et al.* 2016). Specifically, WhatsApp can enable a comprehensive broad participation as well as the provision of feedback in continuous monitoring of activities of agri-nutrition interventions.

Agri-nutrition projects are more often complex due to the kind of interventions and involvement of multiple stakeholders during implementation. Stakeholders range from agriculture, health, trade, local administration, social services, and education. Dealing with such a range of stakeholders can be challenging, and arriving at shared understanding through long chains of command is demanding (Lipsky 2010). It is more challenging to get quality, timely, and reliable data. Communication bureaucracies among stakeholders often lead to delay, distortion, and loss of information along the communication channel (Matejko 1980; Olsen 2006; Zang 2016). WhatsApp has been proved to share extension information and planning among business partners and farmers (Bhattacharjee and

Raj 2016; Barau and Afrad 2017). However, there exists scanty literature close to none on how WhatsApp can be integrated into project management, specifically in the M&E system. This could be a cost-effective way to reduce the challenges of time, geography, human resources, and communication without compromising on the quality and reliability of the data collected. Besides, the platform is more user-friendly and democratic and has participative ways of communication especially in cases that involve different cadres with bureaucratic reporting (Thakur and Chander 2018).

The article shares the experiences of integrating WhatsApp in the accelerated value chain development (AVCD) program – orange fleshed sweet potato (OFSP) value chain M&E system. The AVCD-OFSP value chain was a 3-year (2015–2018) project implemented in Bungoma, Busia, Homa Bay, and Migori counties of Western Kenya. The objectives of the project were to improve nutrition knowledge and practice at the household level by enhancing the utilization of OFSP as part of healthy diets among 65,000 households to increase smallholder farmers' production and productivity and improve OFSP root storage. Target households were reached with a package of interventions; each delivered at different timings. For nutrition beneficiaries, their package included community-level nutrition education, providing training on good agronomic practices, cooking demonstrations, and receiving OFSP vines. Delivery and monitoring of such activities required a well-thought-out M&E plan that would track activities, the number of times the same household had been reached with each intervention, the number of beneficiaries, and the total number of households reached. Real-time communication for planning and feedback on the activities was vital; hence, the adoption of the WhatsApp platform. The purpose of the article is to share our experience on the use of the WhatsApp platform for communication, collection of additional monitoring data, and data quality assessment.

## 2 Material and methods

### 2.1 Study area

This study was carried out in Bungoma, Busia, Homa Bay, and Migori counties in Kenya, focusing on 23 wards distributed as follows: Bungoma = 8, Busia = 6, Homa Bay 5, and Migori = 4. These were the same counties and wards where the AVCD-OFSP value chain was

implemented and supported by the Ministries of Agriculture and Health.

## 2.2 Sources of data, sampling technique, and sample size

The 23 wards had a total of 210 health workers and 60 agricultural officers at the time of this study. Of these, 152 actors were directly involved in the implementation of the project, and all were purposively selected to form the WhatsApp platform in June 2016. The composition sampled actors included 100 health workers and 52 agriculture extension officers. The actors were inducted on how to share summary information on events they coordinated among households targeted by the project. The platform was not open to additional new members unless when replacing a member who has left/transferred to another region outside the project area. Other than the typical data collected using the designed monitoring tools, new data in the form of photos, videos, and texts were to be collected via WhatsApp to back up the primary monitoring data.

## 2.3 Data collection techniques

Study data were obtained from the interaction on the platform through chats, pictures, and videos. The second-level data for the study was obtained through travel requisition forms filed by project staff for activities linked to M&E. A total of 77 travel requisitions (equivalent to 77 field trips) were related to the M&E fieldwork covering the period December 2016–2018 under the OFSP value chain. Cost from the travel requisitions was accumulated on an annual basis to draw the trend. The study also made use of project M&E data collected using continuous monitoring tools (by the same actors on the WhatsApp platform) and uploaded to a central server to help draw the trend and give feedback on the effectiveness of the WhatsApp platform.

## 2.4 Data analysis

Descriptive data were analyzed using STATA vs. 14. This involved analysis of costs in travel requisitions, continuous monitoring data from the server, and analyzing

characteristics of data participants. These data are presented in the form of mean, percentage, range, and frequencies. Together with a summary of the text, videos, and pictures from the WhatsApp platform, it was expected that these groups would have a role in ensuring the following objectives were met: (1) timely and uniform information across project sites, (2) updates about the ongoing field activities, (3) reporting on the progress, (4) learning from each other, and (5) creating positive competition among implementers.

# 3 Results

## 3.1 Characteristics of participants

Of the 152 actors of the WhatsApp platform, 65.7% was female. Community health extension workers (CHEWs) were the majority (44.1%), followed by the agriculture extension staff (15.1%; Table 1). From continuous monitoring data, the project reached 64,413 households, 37,602 of which had a child under 2 years of age.

## 3.2 Experiences from the use of WhatsApp in M&E activities

Over 51% cost reduction was observed in the total M&E cost from 2016 to 2018. Table 2 shows a reduction in the cost of planning and review meetings by 17% by the end of 2017, which further reduced by over 60% by the end of 2018. The highest cost involved monitoring and supervising of community-level nutrition education. This cost reduced by almost half compared to the cost in 2016. To ensure the integrity of the data collected, the expenditure on data quality increased by 50%, though still not the highest cost.

Actors from different cadres involved in planning and implementing various components of the project were on the same platform, thereby collapsing the hierarchical communication dissemination under government structures and giving a shared understanding among project implementers. As a result, the time and cost of traveling between offices to share this information and receive relevant authorizations reduced significantly. The activity schedule and plans were shared on the WhatsApp platform guidance, and clarifications were made up-front before the actual fieldwork.

**Table 1:** Actors on the WhatsApp platform per county

County	Bungoma	Busia	Homa Bay	Migori	Total
Male	9.9	7.9	7.9	8.6	34.2
Female	15.8	16.4	15.1	18.4	65.8
Total	<b>25.7</b>	<b>24.3</b>	<b>23.0</b>	<b>27.0</b>	<b>100.0</b>
Community health workers	11.8	10.5	11.8	9.9	44.1
Subcounty nutrition officer	3.3	2.6	2.6	3.9	12.5
Subcounty nutrition officer	1.3	1.3	1.3	2.0	5.9
Community strategist focal person	0.7	1.3	1.3	1.3	4.6
Agricultural extension officers	5.3	3.9	3.9	2.0	15.1
Subcounty agricultural officer	2.6	2.6	2.6	2.6	10.5
Subcounty crops officer	2.0	1.3	2.6	1.3	7.2
Total	<b>27.0</b>	<b>23.7</b>	<b>26.3</b>	<b>23.0</b>	<b>100.0</b>

**Table 2:** M&E costs across 3 years (cost in USD)

Activity	2016	2017	2018	Grand total
Supervision of community education	9375.1	7974.7	573.0	17922.8
Annual survey	1430.0	1570.0	1,700.0	4700.0
Capacity building	113.0	875.0	850.0	1838.0
Data quality	213.0	269.0	579.0	1061.0
DVM assessment	615.0		659.0	1274.0
Planning and review meetings	2971.0	2439.4	910.0	6320.4
Vine dissemination	6769.0	2997.0	3,889.5	13,655.5
Grand total	<b>21,486.1</b>	<b>16,125.1</b>	<b>9,160.5</b>	<b>46,771.7</b>

Data source: accumulation of travel cost by the M&E team over 3 years.

With the integration of WhatsApp in the reporting system, an improvement was observed in the attendance and participation in project activities both by households and by implementers. Table 3 shows over 60% participation in the seven modules of the community nutrition education. Having the same group undergo 4 months of lesson required constant reminders and follow-ups, which was made easy through this platform. This new measure positively improved the attendance of the caregivers in the community-level nutrition education. By the end of the final topic (Module 7), we still had 64% attendance compared to Round 1 where we had about 50% finishing the seventh topic.

Time taken to do physical data quality assessments was reduced as only few travels were made. Through WhatsApp each supervisor had to submit a photo of the activity they held as evidence for the activity they held. This was to guard against the falsification of monitoring data in the field and to process transport and lunch reimbursement for project actors upon the completion of assignments.

As a planning tool, the platform allowed the sharing of work plans and field schedules by project staff to group members. Targets on number of people to be reached in each location per activity were communicated through WhatsApp before the start of the activity. Through the platform, the project was able to reduce the delay and distortion of information, thereby saving time and communication. The line officers from the ministries and project staff were updated in real time.

This forum created positive competition among actors from different counties, hence boosting the efforts of promoting the OFSP interventions. Actors were motivated to perform better than their counterparts and sharing photos of events and challenges faced. Photos and small video clips from different events motivated the group members, and everyone strived to do their best. It was a learning forum too, where people exchanged ideas on how to make their exhibitions and events better.

## 4 Discussion

In this article, we provide experience from an agriculture–nutrition project which integrated WhatsApp, a social networking platform, in the project M&E system to get real-time, less costly, and quality data. We found that the WhatsApp platform, if agreed as an official communication tool among actors, can be easily integrated into the M&E system to supplement continuous monitoring data collection. Government structures are hierarchical, with many cadres under each level. Nevertheless, planning and implementation of activities required the involvement of each person at all levels before getting to the foot soldiers for actual work. Working across different

Table 3: Participation in community nutrition education by caregivers

Subcounty	Total recruited HH	Healthy mothers during pregnancy	Healthy mother during breastfeeding	Infant feeding	Vitamin A	OFSP a source of Vitamin A	OFSP a source of kitchen garden	Growing OFSP on the farm
Webuye east	2,362	2,356	2,358	2,092	1,890	1,622	1,560	1,254
Bungoma North	2,150	2,100	2,084	2,030	2,052	2,028	1,708	1,532
Matayos	2,152	2,158	2,148	2,058	2,014	1,434	1,296	1,188
Nambale	2,202	2,208	1,736	2,096	2,108	1,938	1,712	1,030
Rangwe	1,758	1,694	1,632	1,658	1,658	1,696	1,674	1,616
Ndhiwa	2,236	2,232	2,190	2,176	2,156	2,106	1,854	1,794
Rongo	2,288	2,254	2,258	2,112	2,122	1,844	1,726	1,470
Uriiri	1,872	1,818	1,762	1,820	1,830	1,168	1,158	1,058
Total	17,020	16,820	16,168	16,042	15,830	13,836	12,688	10,942
%		98.82	94.99	94.25	93.01	81.29	74.55	64.29

cadres comes with different challenges and the cost of gaining a shared understanding among all levels, similar challenges highlighted had earlier been highlighted by Matejko (1980), and Olsen (2006). The project relied on this platform to disseminate information to the ministries of agriculture and health. With the WhatsApp forum, we were able to collapse several hierarchies of reporting and decision-making within the ministry of health and the ministry of agriculture to a well-coordinated platform for planning and real-time feedback. First level of communication was to the top officials who gave an approval the information was then shared on WhatsApp platform to reach lower cadres. Through this collaboration, the ministry of agriculture worked to ensure OFSP clean planting materials were available before the onset of rains for dissemination and OFSP roots available during cooking demonstrations/field days per the quantities demanded. Agriculture extension officers shared the photos of vine field status, and the sales information within the month to the project staff. Any recommendations or changes in volumes were also shared through WhatsApp. A study by Chowdhury (2013) noted how social media could be used to give real-time feedback and improve innovation in agri-food and rural systems; this was confirmed by Kaushik et al. (2018) whose study relates to ours'.

From our experience, the use of WhatsApp led to a substantial reduction in the cost of monitoring activities owing to a decrease in the operation expenses. The cost of planning and review meetings reduced substantially in addition to the cost of back checks and data quality assessment. This can be attributed to reduced M&E travel expenses and having several avenues for data verification. Costs from the accumulation of travel cost by the M&E team to supervise, collect data, or support M&E activities from September 2016 to December 2018 reduced as mobilization was done through the WhatsApp forum. Even though Jayarajan et al. (2017) observed that the inclusion of social media brings benefits beyond including monetary income, other findings (Aker 2010; Cole and Fernando 2012) caution on the use of cheap cost information and communication technology tools, which can lead to a reduction in the costs of extension services but compromise the quality of information. For this study, communication technology (WhatsApp) was used to complement the continuous monitoring data per the project's M&E framework.

Second, WhatsApp led to improved participation in the project activities. Participation in nutrition education increased from 54% to 71%. The forum created positive competition among actors from different project sites, hence boosting the efforts of promoting project interventions.



Social media plays a role in continued professional development (Jaskiewicz and Tulenko 2012), and health workers received information that they can reread some other time, building their capacity and confidence (Jayarajan *et al.* 2017). Daily interaction among actors through this platform builds commitment to the project, increasing participation in physical activities leading to low dropout rates by both community health volunteers and caregivers. An increased participation in project activities was observed both at the planning and at the implementation levels.

Third, as a tool for mobilization, CHEWs are known to be essential in the implementation of community-based activities; however, due to human resource constraints, they are more often expected to do more than they are required to, having a form of appreciation build up their motivation (Jaskiewicz and Tulenko 2012; Chesoli *et al.* 2018). CHEWs were keen to finish their work on schedule to avoid delays in receiving allowances, which in turn worked well in ensuring project activities were implemented per the schedule. Monetary appreciation and allowances have been found to motivate actors to perform assigned and motivation to collect quality data (Franco *et al.* 2002; Mbindyo and Blaauw 2009). However, receiving transport and lunch reimbursement could not be the only motivation for this group, but a sense of belonging to a professional platform made the actors invest more in terms of purchasing data bundles from known resource to keep pace with peers through this forum. This study is in agreement with other studies that noted motivation is not only monetary but obtained from several dimensions (Ryan and Deci 2000; Mbindyo and Blaauw 2009; Hotchkiss *et al.* 2015). These WhatsApp forums instilled a sense of belonging, *i.e.*, even after one had been transferred, they still requested to remain in the group.

Social media is useful in the dissemination of agriculture extension services to farmers because of this existing knowledge mobilization for different agricultural activities had been made easy (Chowdhury 2013; Bhattacharjee and Raj 2016; Barau and Afrad 2017). A study by Raj (2017) found out that social media can be useful in mobilization through planning and for sharing information and creating awareness on ongoing developments. This tool was used to work more like the word-of-mouth method of communication. In activities such as field days and vine dissemination, one word to the key person would go viral among project beneficiaries and external ones. This led to overmobilization in most instances, which was favorable to the project. However, dealing with, largely unplanned crowds

sometimes proved a challenge. Social networking forums such as WhatsApp are strong mobilizers both at the top level among implementers and at the grassroots level; however, it can also be harmful in the event of overmobilization of miscommunication (Thackeray *et al.* 2008).

Fourth, WhatsApp was an essential tool for data verification. Other than the typical data collected using designed monitoring tools, additional data in the form of photos, videos, and texts were obtained via WhatsApp. Hence, forms physically submitted were verifiable as there was more certainty that the activities took place. Some data collectors did not give valid results. Besides, the supervision checklist was, most of the time, prefilled without doing the actual work. Data verification from field activities was costly, having to do several back checks and physical field follow-ups. In this case, WhatsApp came in to regulate such data collection issues by allowing for verification of each activity done and supervised. Through WhatsApp, we were able to track events in each subcounty, getting real-time feedback on activity status from different sites. The cost of verifying this information through back checks and the time taken for going around all the groups were made easier.

Lastly, the use of the platform was not without challenges, especially the sharing of irrelevant posts and bulky data. Makinen and Kuira (2008) observed that social media could exaggerate information, creating miscommunication or conflict. This means that a moderator has to be at hand to ensure that what is shared is in line with the set group by-laws (Kansiime *et al.* 2019). In line with the experiences, the literature reveals how irrelevant posts could impede the usefulness of social media in the delivery of extension information (Makinen and Kuira 2008; Zammit 2017; Thakur and Chander 2018). Other findings indicate that stakeholders can innovatively use social media in the promotion of intervention. However, they are unlikely to engage unless they understand the benefits of interactions and how to go about the weak ties to foster strong relations (Kaushik *et al.* 2018). Sharing a platform with people you do not physically know creates trust issues, and it takes time to develop strong ties. The main challenge in the adoption of this tool in the M&E system is the lack of knowledge and organized efforts to adopt such tool, for agricultural extension is gaining momentum; however, it is faced with the same challenge as observed by this study in India (Cole and Fernando 2012). Data security and confidentiality make some people skeptical in this application; however, some problems can be managed

through controlled use. Staff transfer and replacements called for the continuous induction of new entrants to the forum, and some were not keen on the rules and regulations of the group. As mentioned earlier, some transferred staff were not willing to exit the group, which led to a spillover of information outside the project sites.

Ensuring that only relevant content is shared on the platform requires considerable effort. Sharing of irrelevant posts in the form of jokes, greetings, and advertisements creates an unnecessary loss of time, Internet data, and phone memory issues. Besides, it also causes information overload and dilution of relevant posts shared in the group. Another limitation is the passive users in the group. This was addressed by having rules to guide what is posted or shared with a member before being added to the group. Inactive members of the group had to be followed up privately to check on their opinion on the topic of discussion, while the dominating member had to be regulated by the group admins. In the event, feedbacks are required, only a percentage of the members give feedback, which could lead to dominance by some members; besides some members could look down on other's efforts. Lack of proper control can easily lead to a spread of alarming and sometimes false information. The admins of the two groups had to be on the watch to address such issues. Low phone capacity among actors was a handicap when data were bulky.

## 5 Conclusion

Thus, it can be concluded that WhatsApp can successfully be integrated into the M&E system to collect additional information for verification and quality control, reducing staff travels to the field for planning or data verification. Some strengths from the use of the platform are that it is an easy and affordable means of passing information across a diverse force, which is necessary in M&E. The use of WhatsApp can lead to emulation of the preexisting dynamics of relations among different cadres by promoting peer discussion and learning and can even break down the rigid social and professional hierarchical structures that slow down the project implementation process. When well utilized, WhatsApp is a compelling tool in project monitoring to mitigate the challenges involved in communication. It offers an opportunity to share information on one platform among different cadres and facilitates collective action in multisectoral approach projects. Actors did not

only dedicate their time but also used internet data bundles from purchased their own resources. This promotes community buy-in, promoting the adoption of project interventions. With the launch of WhatsApp business application in 2018, businesses now have a better interface with the user. Research for development projects should also tap into this opportunity for low-cost, quality, timely, and reliable data.

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