Research Brief

07

IMPACT

Mobile services: bridging the agricultural knowledge gap

Summary

One in three people in the developing world suffer from 'hidden hunger', or micronutrient deficiency, due to a lack of information on proper nutrition. This is a major cause of illness, poor growth, reduced productivity and impaired cognitive development. To help combat the problem, CABI and its partners developed content for multiple mobile-phone based messaging services during a three year mNutrition initiative, which aimed to increase knowledge of nutrition, health and agriculture in 12 countries across Africa and Asia. As lessons were learnt about content management processes, content was also delivered to millions of farmers through Mobile Network Operator (MNO)-led, content driven services, delivering agriculture or health information. This case study presents lessons from all 12 countries and results of an impact assessment carried out by GSMA for six agriculture Value Added Services (VAS).

Key highlights

- Localised content created in 12 countries.

- Content available in 24 local languages.

- Freely accessible Nutrition Knowledge Bank.

- Over 12,000 messages produced.

- Over 1,500 factsheets produced.

- 12 local partners trained in quality content development.

- Services developed under mNutrition's mAgri component cumulatively reached more than 5 million registered users worldwide.

- Over 1.5 million mAgri users made changes to their behaviour, of which 36% made on-farm changes, including planting, land management, and harvest and storage practices.

Context

'Hidden hunger' or micronutrient deficiency is a major cause of illness, which stunts growth, reduces poverty and impairs cognitive development. Poor access to agricultural and health information is therefore a major barrier to rural communities adopting the best nutritional practices, particularly for women and vulnerable groups in marginalised areas.

In recent years, mobiles have contributed to the most innovative changes in peoples' lives in the developing world. From connecting people through traditional voice calls, to offering safe, flexible banking options, the mobile revolution is not slowing down. Yet for many farming communities, access to sufficient agricultural information remains a challenge due to poor transport and communication infrastructure, and a reliance on overstretched traditional agricultural extension services.

The 3-year mNutrition Initiative, launched in 2014, was funded by the mobile network operators' (MNO) trade body, GSMA, in partnership with the UK Government's Department for International Development (DFID). The initiative, which ended in May 2017, worked with MNOs in 12 countries in Africa (Ghana, Kenya, Malawi, Mozambique, Nigeria, Tanzania, Uganda and Zambia) and South Asia (Bangladesh, Myanmar, Pakistan and Sri Lanka) to develop and scale up the delivery of health and agriculture-related services using mobile phone-based platforms.

GSMA leveraged expertise and capacity from two of its existing development initiatives under Mobile for Development – mFarmer (mAgri)[1] and mHealth[2] – and brought global content partners (GCPs) on board to manage the content creation process. As a world leader in knowledge management, CABI led the GCP consortium, which also included the British Medical Journal (BMJ), the Global Alliance for Improved Nutrition (GAIN), Oxfam GB and the International Livestock Research Institute (ILRI). The consortium was responsible for researching the nutrition landscape in each country, contracting and working with local content partners (LCPs) to develop their capacity, and build sustainable content development models.

In three years, mNutrition produced localised content in 12 countries and 24 local languages. 12 local partners were trained in quality content development resulting in the production of 12,000 messages and over 1,500 factsheets under mAgri and mHealth. By May 2017, content driven services using the messages developed or enhanced under mAgri had cumulatively reached more than 5 million registered users worldwide, and over 1.5 million users had made changes to their behaviour (GSMA, 2017), with 36% of all registered users having made on-farm changes (GSMA, 2017) in planting, land management, and harvest and storage practices, among other agricultural practices.

What we did

A key factor constraining the development of agriculture, health and nutrition mobile content services is a lack of trusted in-country partners to provide high quality content to meet the needs of local people, service providers and government authorities (GSMA, 2014). In addition, content developed by international organisations (e.g. the World Health Organization), while technically accurate, often lacks

---

[1] The mAgri team worked with six MNOs to support the launch and scale of agricultural Value-Added Services in Bangladesh, Ghana, Malawi, Myanmar, Pakistan and Sri Lanka.

[2] Mobile health services were created or extended in eight countries: Ghana, Kenya, Malawi, Mozambique, Nigeria, Tanzania, Uganda and Zambia

insights into local needs, motivations and barriers to change, which are required if messages are to bring about positive changes in behaviour.

The mNutrition Initiative was supported by a CABI-led consortium of global partners to deliver the content stream. The first step involved the GCPs developing country-specific national landscape studies and content frameworks to pinpoint the key nutritional issues, interventions, crops and livestock that could be supported through mobile messaging. The GCPs also built a rigorous content production process (Figure 1) which considered all of the necessary processes for successful content creation, including sourcing quality reference material, validation, user testing, translation and quality assurance.

Figure 1: The content development process
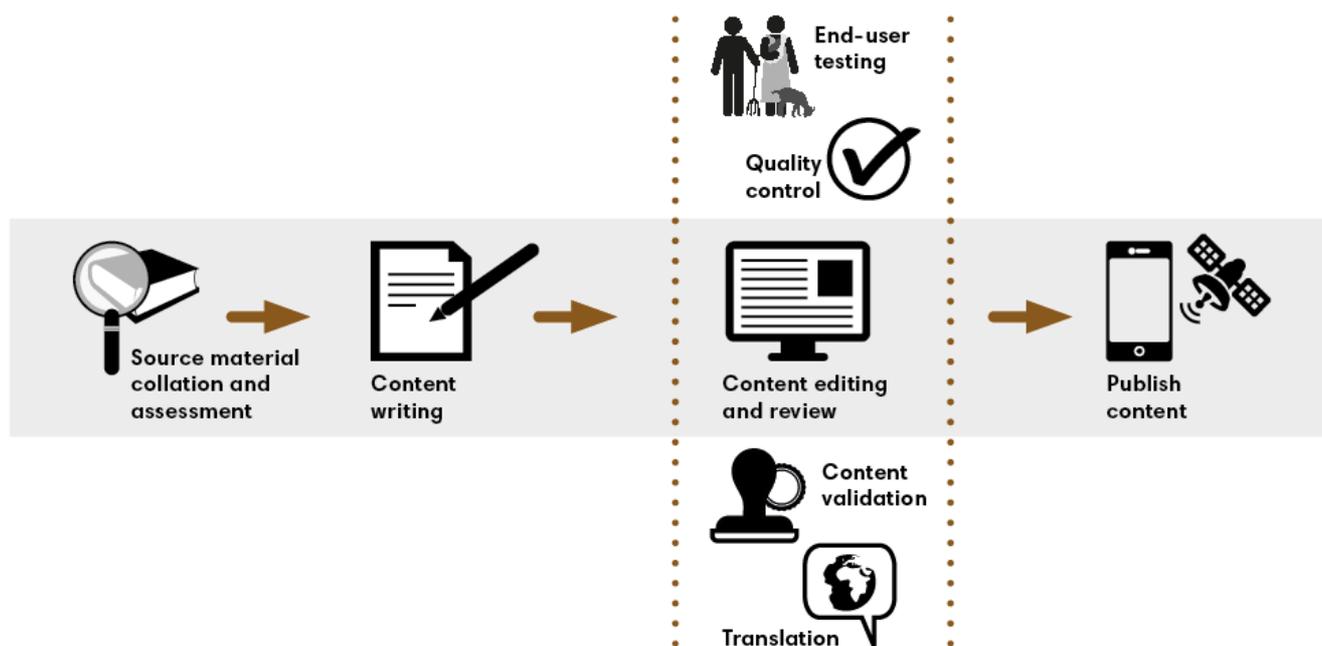
As part of the quality control process, the GCPs also created a series of quality assurance methods (Table 1). Four key quality principles were identified as part of this process to ensure that content adhered to the given criteria (Table 2).

Table 1: Description of quality assurance methodologies used to assess mNutrition content

Quality assurance methodology	Description
Country prioritisation	Identify key crops and livestock for content coverage, and appropriate priority interventions and recommendations
Quality assurance process	Check content is accurate, safe, effective, referenced, reliable and gramatically correct
End-user testing (pre-release)	Confirm content is user-friendly
Validation	Confirm content meets national requirements
Quality control	Check quality assurance process has been followed
End-user testing (post-release)	Confirm content is understandable and remains on message

Table 2: Quality principles and how they are met through the quality assurance assessment

Principle	Criteria	Description	Quality assessment methodology
Reliable	Validated	Approved for use by national/local experts	Validation
	Trustworthy	From a reliable and trusted source	Quality assurance process
Relevant	Specific	Crop and contex-specific	Quality assurance process
	Timely	Time of day, time of crop cycle, incident alert	Quality assurance process End-user testing (post)
	Localised	Correct geography, production system, varieties, etc.	Quality assurance process Validation End-user testing (pre and post)
Clear	Language	Non-scientific, gender appropriate and in the correct local language	End-user testing (pre and post)
	Tone	In a trustworthy and accessible 'voice'	End-user testing (pre and post)
	Importance	Why the action will be of benefit	Country prioritisation Validation End-user testing (pre and post)
Practical	Actionable	Provides suggestions and solutions that the end-user can act on	Country prioritisation End-user testing (pre and post)
	Realistic	Is appropriate in the given context, and with the end-users' given resources	End-user testing (pre and post) Validation

Local content was identified by GSMA as the "key driver in creating a step change in the usage and engagement of the mobile internet and mobile-enabled services, particularly for mid- and low-income consumers in emerging markets" (GSMA, 2014). To ensure that localised, mobile-ready content was produced and managed by LCPs, the GCPs identified local, motivated content organisations – including private companies, NGOs and government entities – and provided training to each LCP to enable them to develop high quality content, and identify and adhere to national priorities.

The content development process (Figure 1) necessitated multiple tools to support implementation. Content structures and tools were designed in a way that provided a coherent and systematic approach to content creation, harmonising how content was categorised, produced, quality controlled and shared, regardless of the implementing country. The GCPs also created content templates and provided training to LCPs on how to use them.

The LCP content produced had a dual purpose: to be used on a mobile service in each implementing country; and to be freely and openly available on mNutrition's open-access content repository, Nutrition Knowledge Bank, which stored all of the nutrition, health and agriculture factsheets and mobile messages produced by the LCPs to maximise the potential for content that could be reused and repurposed by any interested party.

The aim was that the Nutrition Knowledge Bank would be particularly useful for MNOs who wished to repurpose content for mobile services, yet also be of interest to governmental agricultural and health

ministries, extension workers, community groups and development practitioners. By employing standardised content structures and tools, the process for uploading content to the Nutrition Knowledge Bank was streamlined.

Despite receiving training, and tools and structures to guide content development, in some instances content produced by LCPs was not of a high enough quality. Therefore, in 2016, the quality control process for content development was modified to introduce an additional step in which GSMA and GCPs provided the go-ahead for content publication, or requested LCPs to undertake further editing. However, this approach reduced the level of content ownership by the LCPs, and meant that the content produced shifted from being user-centric to expert-centric, which increased reliance on external support and input from GCPs. Changes to the content development process also meant that some of the training offered to LCPs at the start was no longer relevant to the modified content production processes.

On several occasions during implementation of mNutrition, 'quality' objectives for different audiences were also in direct conflict, which made defining a quality assurance process challenging. For example, for the purpose of government ministries and other stakeholders, content had to be 'good' in terms of being scientifically accurate; for target households, content had to be understandable, actionable and accessible. LCPs were instructed by GCPs to prioritise interventions and key messaging that addressed an identified needs gap based on the country-specific national landscape studies and content frameworks. However, despite this effort, there was an unavoidable burden on LCPs to produce the content within the set timeframe, resulting in lower quality material.

At the request of MNOs, government content validation was also introduced. This approval process took the form of a signed letter, allowing LCPs and MNOs to use the content beyond the lifetime of mNutrition without the need to seek further approval from the authorities. However, obtaining signed validation letters was often challenging. Project and government staff taking part in the validation process dedicated much time and energy to securing letters, sometimes up to five months after content drafting. Furthermore, the benefits of the validation sign-off letters were questionable. First and foremost, engaging government experts after the content had been user-tested often led to the development of clinical content which was not as effective at changing behaviour. Also, governmental validation occurred at the final content development step prior to the content going through quality control.

In most countries, the providers of the agricultural VAS were MNOs, while in a few cases private sector intermediaries operated the VAS through a specific contract with a MNO. Content was used in a variety of ways including: a) SMS and/or Interactive Voice Response (IVR) push content, where content – segmented according to location, language, crop preference and in some cases use of particular seed/irrigation strategy – was sent on a regular basis to registered users; and b) content accessed using USSD menus where farmers register and choose the content they wish to access, e.g. on a favoured crop. In some cases farmers registered for a service, and in others extension staff and lead farmers were targeted with content with the view that content would be shared further through interpersonal interactions.

Content development took place independently of the MNOs – who found it hard to be explicit about identification of end-users without understanding what content would be available. As a result, generic content sets were developed for a particular country. In some cases these were used directly by MNOs with no further modification, while in others an independent 'content styliser' adapted content to suit the final set of services provided.

Key recommendations for content creation

The mNutrition Initiative has provided many significant lessons on local content development which can be categorised under four key themes: localisation, quality, partnership and sustainability.

Localisation

In September 2014, GSMA published an industry intelligence report, Local World – Content for the Next Wave of Growth, in which local content is identified as "the key driver in creating a step change in the usage and engagement of the mobile internet and mobile-enabled services, particularly for mid- and low-income consumers in emerging markets" (GSMA, 2014). The report also defines, discusses and differentiates between types of local content: available in local language; locally relevant information; and locally created content. Although content may be available in a local language it may not be particularly relevant to local audiences. Local creation is deemed to be the best way forward, but it is not easy, particularly in markets where there is a lack of data on consumer insights. If expert-generated content is to be used, it must engage with users in a 'user-centred design process' to ensure the content is really something users find interesting and relevant.

1.   Establish ownership of the content process

A multi-layered, multi-partner content development process will undoubtedly have a level of complexity which can hinder ownership of outputs. To overcome this challenge, it is important to establish content ownership and engagement at country level at every stage of the content development process.

It is imperative that all key stakeholders are engaged in the planning stages in order to outline all parties' expectations from the outset, and to secure investment from a range of stakeholders. This may require more time and effort up-front, but undoubtedly ensures that implementation is more efficient and effective.

Clarity of relationships between implementing partners, validators and end-user testers is also a must for transparent roles, responsibilities and delivery of content, which is especially important in a content development stream where multiple factors need to run simultaneously to produce high quality content.

Whilst the LCP model worked in many ways, a key lesson is that providing a robust content process and ongoing technical support is only half the story. Local content partners need sufficient time, practice and ownership of the processes and outputs in order to institutionalise these new ways of working. In doing so, their capacity, efficiency and credibility to continue in this field will be far greater.

2.   Ensure development of user-centric content

Local content creation is not an easy task to undertake, especially in markets where there is a lack of data on consumer insights. Creating content based specifically on user-demand can therefore be a costly and time-consuming endeavour, requiring field research into specific local practices, interests and details which have not been well documented in literature. However, to ensure that content is as relevant as possible and can support behaviour change, it must be developed with specific users in mind to ensure content is relevant for the target audience. It is also important for LCPs to consider the way an agriculture VAS will deliver the content to its target audience (i.e. via SMS/IVR or using USSD content menus), and who its main target audience will be (i.e. farmers or extension staff).

User design work should therefore be the first step in the content creation process, before the content is even developed. Furthermore, it is crucial to ensure that sufficient time is allocated to user testing – including incorporating learnings – as part of the content development process.

Quality

1. Define quality

When defining quality, it is critical to determine and define who the content needs to be 'good' for. The answer should then be communicated to all stakeholders as early as possible in order to provide clarity and opportunity for collaboration to better design content to address end-users' needs, motivations and barriers to changing behaviour and adopting new interventions. For example, an agricultural VAS' concern for quality is likely to be directly related to farmer perceptions, and messages that will attract and maintain the highest customer base.

2. Limit changes in aims and expectations

Many processes and hypotheses relating to content development were being tested across the mNutrition Initiative and the content development process by partners including GCPs, LCPs, in-country government validators and agricultural VAS providers. These involved a high level of complexity, and could have been tested, and expectations clarified, if a pilot had been implemented.
Client expectations, scope of content, objectives, coverage, quality and style of the content should be defined from the outset. If changes need to me made, these should be kept to a minimum to avoid misaligned objectives, delayed implementation of processes and fatigue. However, if a client's aims are not being met and changes need to be introduced, timeframes must also be reviewed.

3. Content providers need sufficient time

First and foremost, it should be ensured that created content meets end-users' and government partners' demands. Then, given the time constraints – for service launch, identified content priorities, and the content development process (Figure 1) – reasonable content quantity should be agreed on. Necessary content development steps such as validation and sign off of content are often difficult to plan for as they can depend on availability of government staff with many competing priorities. In one instance, government sign off took six months to secure.

4. Provide training continuity

One-off training at the start of the mNutrition content process was insufficient to enable LCPs to produce high quality outputs as the content team, and parameters of the deliverables continued to change.
For successful content development, a clear set of deliverables (scope, number of messages, languages, format etc.) and quality criteria need to be established before training is delivered to a fully constituted content team.

5. Provide clear content creation tools

Frameworks and tools that are developed to support content creation need to suit the needs of a given agricultural VAS, for example, or be sufficiently adapted to do so. Furthermore, as was the case for mNutrition, new content structures – frameworks to select priority interventions across specific audience groups – should engage with stakeholders from an early stage and meet the needs of content developers in case the project is being implemented in multiple countries. In addition, when working with

new or specific tools – such as content templates or tools for collecting information on the reference materials used – spot checks are required to make sure that they are being appropriately implemented during early content development, and ongoing support is provided to ensure close adherence to these as the process continues.

6.   Content validators should be involved at all stages of development

If government validation is required, involvement should not be limited to final sign-off at the end of the content development process. Seeking validation during content production (i.e. throughout end-user testing and translations) should avoid the need to go back to validators for a second sign-off after additional edits are made based on end-user testing or other process steps.

Partnership

1.   Nurture true partnerships

GCPs and LCPs were able to leverage support and flexibility from each other by building strong partnerships based on understanding and respect. Nevertheless, closer collaboration between LCPs and MNOs after content development and before end-user testing would have created a smoother editing process.

2.   Partners should be carefully selected

To ensure smooth content development processes, it is critical to work with local partners with skills and expertise in priority areas. The highest quality content, the timeliest delivery, and the most efficient LCPs to work with were those who had extensive prior subject-matter expertise, experience with social behaviour change communication programming, and linkages to relevant government entities.

Sustainability

1.   Strengthen LCPs' reputation

Showcasing LCPs' achievements, and the opportunities available to them for repurposing content, will contribute to their reputation as a quality content provider, which itself ensures that LCPs are more likely and better prepared to receive future content-related work from local agricultural VAS providers.

2.   Strengthen LCPs' capacity

LCP's require support to continue to follow a rigorous, quality-driven content process. Quality assurance and process checks must also be embedded within organisational ways of working.

3.   Build long-term partnerships

LCPs need support to facilitate and nurture good relationships with key in-country partners, such as government, service providers and MNOs.

The way forward

The future for mobile agriculture is bright. As access to smartphone technology increases, opportunities to provide rural communities with digital services are growing. According to GSMA (2017), the estimated size of the target market for agricultural VAS in sub-Saharan Africa and Asia was valued at almost US$50 million in 2016.

The mNutrition Initiative showed how, with the right approach, health and agriculture-related services using mobile-phone based platforms and with information at the core, can be successfully developed and scaled. While there were many steps within mNutrition's content production process, the most important, due to their cross-cutting nature and value for widespread applicability to other agricultural content creation projects, were localisation, quality, partnership and sustainability.

Further work is needed in the agricultural VAS arena to develop sustainable business models that do not rely on external public funds either directly or indirectly. Willingness to pay for information was limited, although this varied between countries and it is likely that effective business models will need to consider a broader range of bundled services with mixed models where farmers and businesses both contribute. Content production has a high initial cost – particularly if quality is to be guaranteed and it may be that relying on public sector funding for initial content development remains a necessity.

References

CABI. 2017. Lessons learned from the content development stream of the mNutrition initiative. Key recommendations for content creation. CABI, Wallingford. Available at: **https://bit.ly/2I1Xjsk**

CABI. 2017. Lessons learned from the content development stream of the mNutrition initiative. End-user feedback and its role in producing high-quality localized content. mNutrition Brief 2. CABI, Wallingford. Available at: **https://bit.ly/2pH4LRS**

CABI. 2017. Lessons learned from the content development stream of the mNutrition initiative. How to set up the right content creation model, processes and structures to achieve maximum project efficiency and quality outputs. mNutrition Brief 1. CABI, Wallingford. Available at: **https://bit.ly/2ujEizD**

CABI. 2017. Lessons learned from the content development stream of the mNutrition initiative. Quality assurance and quality control processes as a part of mNutrition's aim to produce high-quality content. mNutrition Brief 3. CABI, Wallingford. Available at: **https://bit.ly/2GuTeQb**

CABI. 2017. Lessons learned from the content development stream of the mNutrition initiative. Validating the content via sign-off letters as a part of the content development process. mNutrition Brief 4. CABI, Wallingford. Available at: **https://bit.ly/2pFQTln**

GSMA. 2014. Local world – content for the next wave of growth. GSMA, London. Available at: **http://bit.ly/2AhSPuU**

GSMA. 2017. Creating scalable, engaging mobile solutions for agriculture. A study of six content services in the mNutrition initiative portfolio. GSMA, London. Available at: **http://bit.ly/2mWlku4**

Day, C. 2018. 'mNutrition: experiences and lessons learned in content development'. In: R. Duncombe (eds.), Mobile technology for agricultural and rural development in the global south. CABI, Wallingford. In press

Donors

This publication is a result of the GSMA mNutrition Initiative funded with UK aid from the UK government

Partners

Author

Charlotte Day, CABI Nutrition Project Manager

Acknowledgements

Editorial team

Olivia Frost, WRENmedia (technical writer)

Susanna Cartmell, WRENmedia (technical writer)

Dannie Romney, CABI (editorial coordinator and technical writer)

How to cite this paper