Agro-advisory messaging in Kenya: Insights from Cognitive and Behavioural Analysis

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Executive Summary

This report presents findings from a qualitative study investigating the effectiveness of agro-advisory messaging disseminated through Mediae's Shamba Shape Up (SSU), a television program, and iShamba, a SMS service, among livestock farmers in Kenya. The study, conducted in Kiambu and Nakuru counties, employed focus group discussions (FGDs), free word elicitation exercises, cognitive mapping, vignettes and probing techniques to understand farmers' perceptions, engagement patterns, effectiveness and challenges faced when viewing or using the programs. The analysis reveals that both platforms are valuable sources of agricultural information for farmers, but engagement and trust slightly vary across locations and platforms. Television remains the most preferred medium, valued for its accessibility and capacity for shared family viewing. However, scheduling conflicts and excessive advertising negatively impact engagement. iShamba, while appreciated for its timely delivery of crucial agricultural information, particularly weather updates, faced some scepticism regarding forecast accuracy, influenced by both personal experience and, in some cases, religious beliefs. Both programs are valued for their actionable, practical advice, particularly on topics directly relevant to the farmers' needs (such as crop selection and livestock management). Overall, trust in the programs is linked to the credibility of experts featured, the tangible outcomes of applying the information, responsiveness to inquiries, and the platform's association with Citizen TV. Farmers in Kiambu exhibited greater caution than those in Nakuru, frequently cross-checking information before adoption. Financial literacy emerged as a significant barrier to engagement and investment, particularly in Kiambu. The study recommends several key actions to improve program effectiveness: optimizing content to be more regionally tailored and relevant, improving platform usability (particularly for iShamba in Kiambu), providing targeted financial literacy training, enhancing weather forecast reliability and communication, and increasing the use of practical demonstrations and relatable success stories.

Future research is needed to measure the quantitative impact of these programs on agricultural outcomes and farmer livelihoods, explore the effectiveness of varied messaging strategies and channels, investigate the roles of social networks and community interactions, evaluate the impact of the programs on gender equity, and develop targeted financial literacy interventions to address the identified challenges. This research provides critical insights to guide program development and improve the effectiveness of these crucial agricultural advisory services.

Acknowledgement

The authors acknowledge the valuable support and collaboration with The Mediae Company and iShamba team, whose contributions were integral to the completion of this study. Special recognition is given to Calvin Kiprop and Lilian Kirwa for their expertise, support and guidance, which greatly enhanced the quality and depth of the research. Their efforts in facilitating key insights and operational support are deeply appreciated.

Introduction

In the context of East Africa's agricultural landscape, where smallholder farmers face numerous challenges ranging from climate variability to market access, innovative solutions are essential for enhancing productivity and sustainability. Shamba Shape Up (SSU), a pioneering agricultural television program produced by Mediae, has emerged as a transformative platform since its launch in 2012. By combining education and entertainment, SSU effectively addresses the specific challenges of smallholder farmers through a unique "makeover" format, enabling experts to visit farms and demonstrate practical techniques tailored to local conditions. This initiative has reached millions of viewers across Kenya, Uganda, and Tanzania (Vyas et al., 2024).

Complementing the impact of SSU, the mobile-based service iShamba, launched in 2015, represents a significant advancement in agricultural communication. iShamba delivers vital information directly to farmers' mobile phones, including weather updates, market prices, and best practices for crop and livestock management. This service, along with its call centre staffed with agricultural experts providing personalized advice via SMS, further enhances continuous support for farmers.

Objectives

This report aims to evaluate the effectiveness of agro-advisory messaging channels, the television show Shamba Shape Up and mobile-based service iShamba, assessing their impact on farmer recipients. Key factors contributing to the success of these initiatives will be identified.

Additionally, the analysis will map out behavioural patterns, seeking to identify receivers' unique cognitive journeys. The enhancement of outreach strategies for agro-advisory messaging will be explored to optimize engagement and information dissemination. Furthermore, the attribution of success factors in The Mediae Company's agro-advisory initiatives will be determined to better understand and replicate effective practices within agricultural advisory services.

The scope of this research will specifically focus on livestock farmers, emphasizing the roles of television and SMS, while also addressing climate and financial literacy, as well as brand association and awareness. Utilizing focus group discussions (FGDs) and elicitation methods, this analysis seeks to provide actionable insights that can drive greater impact in agricultural advisory practices.

Research Questions

- How does brand association shape consumer perception, trust and uptake of agro-advisory messaging amongst livestock farmers?
- In what ways do user motivations and perceived barriers affect the usage and uptake of agro-advisory messaging through TV and SMS?
- What behavioural patterns can be identified when livestock farmers receive agro-advisory messages?
- What strategies can be implemented to enhance outreach and engagement efforts for agro-advisory messaging for livestock farmers?

Importance of Agro-Advisory Messaging in Supporting Livestock Farmers

Agro-advisory messaging is a critical tool for enhancing the resilience, productivity, and sustainability of livestock farming in Kenya. With livestock farming contributing significantly to both national GDP and smallholder livelihoods (ILRI, 2021), targeted advisory services help bridge the gap between traditional practices and the demands of modern agriculture. This is particularly important in the face of challenges such as climate variability, and limited access to veterinary and financial services. Agro-advisory messaging addresses these gaps by equipping farmers with the knowledge, tools, and support they need to navigate these obstacles effectively.

The increasing unpredictability of weather patterns, driven by climate change, poses a major threat to Kenya's livestock sector. Smallholder farmers, particularly in arid and semi-arid regions, face pasture degradation, water scarcity, and increased vulnerability to droughts (Recha, 2018). Agro-advisory messaging supports farmers in adapting to these challenges by providing tailored guidance on climate-resilient practices, such as drought-resistant fodder crops, water conservation techniques, and long-term climate planning. Digital platforms like iShamba and Shamba Shape Up play a key role in disseminating this information, using region-specific forecasts and actionable advice to help farmers mitigate the impacts of climate variability.

Livestock diseases, including Foot and Mouth Disease and Anthrax, remain a major constraint on productivity and income generation (Omondi et al., 2014). Agro-advisory messaging equips farmers with critical information on disease prevention, vaccination schedules, and treatment options. Platforms like Shamba Shape Up and iShamba can amplify this impact by offering practical, step-by-step advice on maintaining animal health, thereby reducing economic losses and improving household resilience.

Financial literacy is another key area where agro-advisory messaging can make a significant impact. Farmers often face barriers to accessing affordable credit and navigating financial systems, limiting their ability to invest in inputs or expand their operations (Kansiime et al., 2014). By simplifying financial concepts and highlighting available financial schemes, agro-advisory services help farmers make informed decisions.

Digital agro-advisory platforms, such as Shamba Shape Up and iShamba could transform how farmers access information and support. Using mobile technology, SMS-based advisory, and localized content to reach farmers in remote areas, and overcoming traditional barriers such as geographic isolation and limited extension services empowers farmers to manage their farms. The integration of such platforms into farmers' daily practices not only improves productivity but also fosters greater trust in agro-advisory services.

Despite the benefits of agro-advisory services, many farmers remain sceptical about their reliability and affordability (Kamau et al., 2024; Gatheru et al., 2021). Challenges such as delayed advice, generalized recommendations, and high costs undermine their effectiveness (Goodluck et al., 2024). Mediae's Shamba Shape Up and iShamba must address these concerns by ensuring their messaging is accurate, localized, and timely. Incorporating feedback directly from farmers can further enhance trust and engagement.

Context

The collaborative study between Busara and CIAT evaluates the impact of The Mediae Company, a key disseminator of agricultural information in Kenya through platforms like Shamba Shape Up and iShamba. While Mediae's KAP surveys have focused on post-intervention metrics such as farmer productivity and attitude changes, it is key to also understand farmers' thought processes informing their farm management decisions. This research addresses the gap by examining media channel effectiveness, the impact of message content on knowledge and behaviour, and mapping behavioural patterns before and after exposure to agro-advisory messages. By doing so, the study aims to optimize outreach strategies and highlight success factors in Mediae's initiatives.

Overview of the Agro-Advisory Landscape

Kenya's livestock sector, predominantly managed by smallholder farmers, significantly contributes to the national GDP (ILRI, 2021; Recha, 2018). Despite its importance, effectively utilizing agro-advisory services remains a significant challenge (ILRI, 2021). Historically, smallholder farmers relied on traditional knowledge and practices (Roncoli et al., 2002; Zuma-Netshiukhwi et al., 2013). However, the shift towards input-intensive modern agriculture, coupled with increasing climate variability, demonstrates a greater need for formal agro-advisory services (Sharma et al., 2021). Constraints such as limited access, high costs, low digital literacy, and climate unpredictability hinder the adoption of effective advisory systems (Kansiime et al., 2014; Mary et al., 2023; Cole et al., 2016). While digital platforms present a solution, scaling these technologies and ensuring tailored, actionable advice remains a challenge (Daum et al., 2021).

Challenges Faced by Livestock Farmers

Livestock farmers in Kenya face a complex array of challenges that impede their productivity and well-being. These include significant economic losses due to livestock diseases such as Foot and Mouth Disease, Anthrax, and Newcastle Disease, in addition to limited access to veterinary services (Omondi et al., 2014). Farmers also struggle with inadequate access to inputs like water, pasture, credit, and breeding services due to infrastructural limitations, remoteness, and high costs (Kansiime et al., 2014). Weak institutional support, insufficient government extension services, and inadequate infrastructure exacerbate these challenges (Recha, 2018).

Climate change has further heightened vulnerabilities, with frequent droughts and pasture degradation significantly affecting livestock productivity (Recha, 2018). Additionally, knowledge gaps, low technology adoption, and limited participation in farmer groups restrict the uptake of improved practices (Gatheru et al., 2021). Socioeconomic disparities, such as those faced by women and older farmers, further hinder access to advisory services (Muema et al., 2018). These systemic and individual constraints underscore the urgent need for accessible, effective agro-advisory services to enhance productivity and resilience across the sector.

The Importance of Understanding Farmer Perceptions and Behaviour

To design effective agro-advisory services, it is crucial to understand the perceptions, decision-making processes, and behavioural patterns of livestock farmers. Farmers' choices are shaped by a range of cognitive, social, and environmental factors that influence their engagement with advisory services. Challenges such as low trust in advisory providers, perceived ineffectiveness, and financial barriers often discourage farmers from utilizing these services (Gatheru et al., 2021; Kamau et al., 2024).

Cognitive mapping techniques offer valuable insights into these dynamics by enabling researchers to visualize the interplay of factors driving farmer behavior. By identifying key motivators and barriers, these techniques help tailor advisory messages, improve information delivery, and foster trust (Omondi et al., 2014).

Participatory approaches such as cognitive mapping also ensure that interventions reflect farmers' lived realities, building trust and enhancing the likelihood of adoption. Moreover, these insights help policymakers and stakeholders anticipate unintended consequences, prioritize resources, and design evidence-based, farmer-centric policies (Kieti et al., 2022).

Through this lens, understanding respondent perceptions and behaviour is not only essential for effective agro-advisory service delivery but also for promoting sustainable agricultural practices and ensuring that interventions align with the aspirations of livestock farmers.

Methodology

Approach

This study employed a mixed-methods qualitative approach to explore the cognitive and behavioural dynamics influencing livestock farmers' engagement with digital agro-advisory services. By combining focus group discussions (FGDs), cognitive mapping, and participatory exercises, the methodology aimed to uncover the thought processes, barriers, and enablers shaping farmers' adoption of practices recommended by Shamba Shape Up and iShamba.

Behavioural insights frameworks, including Kahneman's System 1 and System 2 thinking, guided the design of data collection tools to capture both intuitive and deliberate decision-making processes. This dual-system lens allowed for a deeper understanding of how perceptions, emotions, and rational evaluations intersect in shaping behaviour.

Key Research Questions

The study was guided by research questions that covered different dimensions derived from the objectives of the research. These questions were as follows:

- How does brand association shape consumer perception, trust and uptake of agro-advisory messaging amongst livestock farmers?
- In what ways do user motivations and perceived barriers affect the usage and uptake of agro-advisory messaging through TV and SMS?
- What behavioural patterns can be identified when livestock farmers receive agro-advisory messages?
- What strategies can be implemented to enhance outreach and engagement efforts for agro-advisory messaging for livestock farmers?

Study Participants

The study was conducted in two different counties in Kenya: Kiambu and Nakuru County, with two study locations per county. We employed random sampling from the Shamba Shape Up database of viewers who had watched the previous episodes, participated in iShamba and previously engaged in the Shamba Shape Up surveys. *A total of 32 participants, comprising both male and female livestock farmers, participated in the study.*

A total of four focus group discussions were conducted, with 2 focus groups held per county. These groups consisted of 7-10 participants each, with an aim to have both genders present, from different locations within the area. Notably, the database predominantly comprised of male farmers.

Despite reaching out to an almost equal number of individuals from both genders, male farmers were more readily available to attend the sessions compared to their female counterparts. Even though women account for over 50% of the agricultural labour force in many Sub-Saharan African countries, they tend to earn less and face challenges in accessing assets and resources in enhancing their productivity (FAO, 2023). This could translate to lower participation in external training and activities, taking into consideration competing domestic work in their homes.

Livestock Farmers Representation by Location

County	Kiambu County		Nakuru County	
Sub-location	**Kiambu**	**Thika town**	**Nakuru town**	**Molo town**
Gender				
Male	7	7	5	8
Female	0	1	2	2

Source: Survey results

Data Collection

In the qualitative approach used, we carried out focus group discussions with livestock farmers, employing a participatory research approach. This was tailored for this study to ensure participants feel that they are part of the research agenda and engaged as co-researchers. This also involved the use of cognitive mapping. Cognitive mapping is a technique used to represent and analyse the complex interplay of factors influencing a system. In the context of digital agro-advisory services, this offers a unique lens for understanding farmers' decision-making processes.

The instrument covered three main areas: brand association, effectiveness and challenges and improvements. These areas utilized a variety of interactive qualitative methods to evaluate the impact of messaging and explore the participants' thought processes.

Brand Association

To analyse the perceptions livestock farmers, have on the brand and what they associate it with, we carried out a free word elicitation and mapping exercise. Other aspects of brand association such as trust, reliability and relevance utilized structured prompts to dig deeper into the various influences. For the aspect of engagement, we used local vignettes that were contextualised to the research participants in the area to allow participants to freely express their beliefs by shifting their narrative to a third person.

- Free word elicitation exercise: This involved participants stating word/phrases they associated with the brand. This likely engaged their system 1 thinking which refers to the immediate, instinctual reactions and associations participants have with Shamba Shape-Up and iShamba formed through direct experiences and emotional responses.
- Mapping exercise: This required individuals to draw connections and associations between the main word and the words/phrases they stated likely engaging system 2 thinking. System 2 thinking involves a more reflective, analytical evaluation of Shamba Shape-Up and iShamba that requires conscious thought. It encompasses the reasoning and deliberation that farmers apply when considering the credibility and value of different advisory services.

Other aspects of brand association such as trust, reliability and relevance utilized structured prompts to dig deeper into the various influences. For the aspect of engagement, we used local vignettes that were contextualised to the research participants in the area to allow participants to freely express their beliefs by shifting their narrative to a third person.

Effectiveness

This section focused on the impact of messaging on real world practices using storytelling. Participants were divided into groups where they shared actions, they were able to implement after receiving agro-advisory messaging from Shamba Shape Up/iShamba. This enables participants to speak freely and anonymously while using probes to explore further into their emotions and subjective experiences.

Challenges and Improvements

Looking at the challenges participants face and taking their suggestions on potential areas of improvement involves a more direct approach using probes. This section builds up on all other information already shared through the other exercises but narrows down specifically to areas of interest using direct questioning and probing

During data collection, the following challenges arose:

- Cognitive mapping exercise: Not all participants were able to comprehend the exercise on drawing maps and making connections. Even with further explanation the concept seemed a bit complex for some participants. This could be because of low literacy levels or language barrier.
- Gender disparity: Despite the team's efforts to contact a similar number of male and female participants, female participants availability was quite low resulting in a low representation in the sessions.
- Contacting participants: Recruitment of participants was done via iShamba as they have direct contact with the farmers. This could bias respondents' responses as they may not view Busara as an independent research organisation.

Image from the fieldwork

Findings

A. Brand association and trust

System 1: Fast and Intuitive Thinking

Daniel Kahneman's concept of System 1 (Kahneman, 2011), highlights the brain's intuitive and automatic mode of thinking. System 1 enables rapid judgments and decisions with minimal effort, relying on heuristics—mental shortcuts shaped by past experiences and learned knowledge. These instinctive responses are crucial in shaping how individuals perceive and engage with new information.

Building on this framework, we conducted a **free word elicitation exercise** with farmers from Kiambu and Nakuru counties. Respondents were asked:

1. "What comes to mind when you think of or hear the term *Shamba Shape Up*?"
2. "What comes to mind when you think of or hear the term *iShamba*?"

Participants shared immediate words, phrases, or emotions, offering spontaneous insights into their perceptions. The responses were analysed and visually represented through word clouds, capturing frequently mentioned themes and ideas.

Below are word clouds representing the insights gathered from the word elicitation exercise, visually depicting the most frequently mentioned terms and phrases associated with Shamba Shape Up and iShamba, highlighting the key themes and perceptions held by the respondents.

Shamba Shape Up

Figure 1.1 Shamba Shape Up Word Cloud

The findings from this exercise are summarized below:

- **Strong Brand Perception**: Words like "farming," "modern," and "good" emphasize the program's reputation as a credible and innovative resource for agricultural knowledge. Farmers recognize Shamba Shape Up as a trusted advisor that aligns with contemporary farming needs.
- **Livestock Innovation**: Frequent mentions of "livestock," "technology," and "improvements" suggests that respondents recognize Shamba Shape Up as a program that promotes innovation and enhancements to their current farming practices. This perception implies that the program is not just about traditional practices but is actively encouraging farmers to embrace new and refined technologies and methods for better productivity and sustainability.
- **Educational Value**: Words such as "advice," "information," and "experts" showcase the program's strength as an educational platform, providing actionable guidance and expert-led solutions.
- **Emphasis on Progress**: The inclusion of terms like "upgrading" and "improvements" reflects farmers' recognition of the program as a driver of productivity and sustainability, actively encouraging the adoption of refined methods.

Farmers perceive Shamba Shape Up as a forward-thinking, reliable source of actionable advice, empowering them to modernize their practices and improve their livelihoods.

iShamba

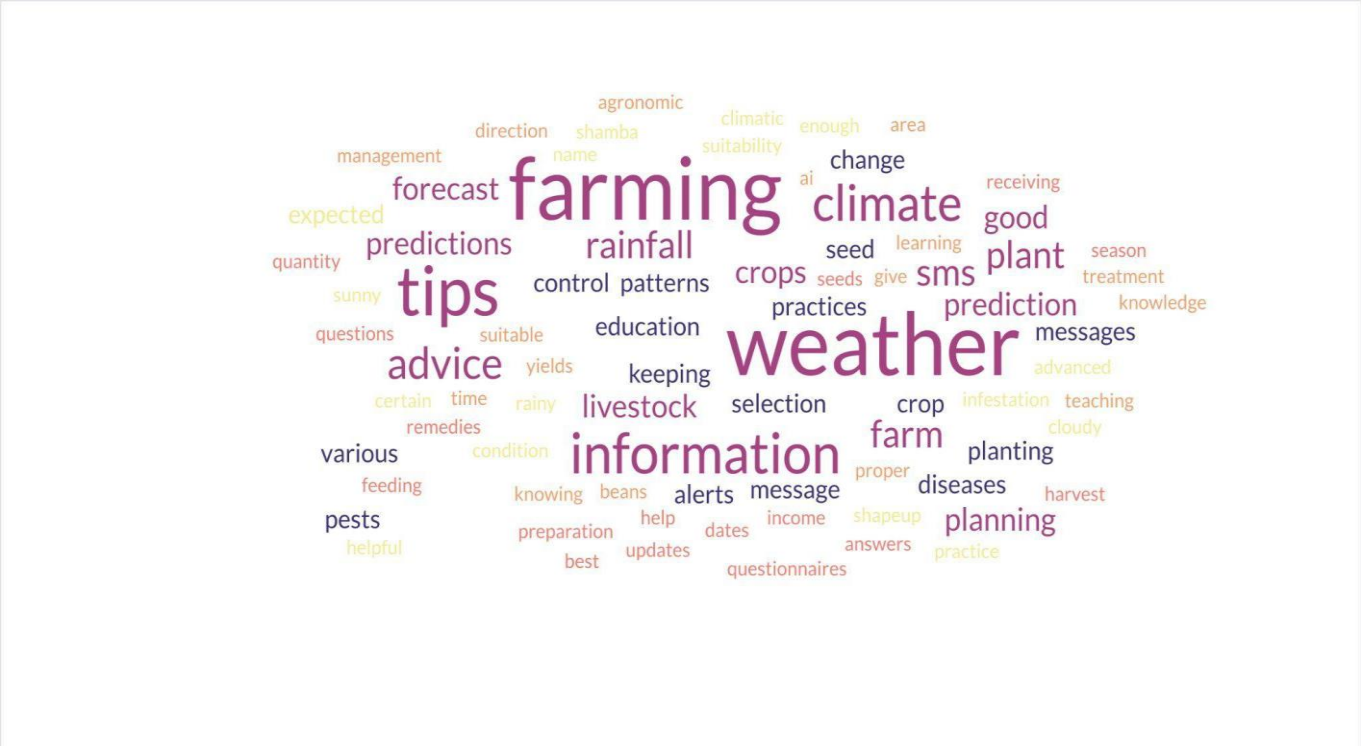


Figure 1.2 iShamba Word Cloud

The findings from this exercise are summarized below:

- **Utility and Practicality**: Words like "farming," "weather," and "tips" underscore the service's role as a real-time resource for agricultural decision-making, particularly through weather updates.
- **Climatic Relevance**: The prominence of terms such as "climate" and "forecast" highlights iShamba's vital role in providing actionable climate-related information, supporting risk management and planning.
- **Accessibility**: Mentions of "SMS" point to the platform's ease of use, making it an accessible advisory tool for farmers even in remote areas.
- **Comprehensive Coverage**: Farmers' references to "livestock," "planning," and "crops" indicate that iShamba's offerings span multiple aspects of farm management, from seed selection to livestock care and weather prediction.

Overall, these associations reflect a positive perception of iShamba as a comprehensive and indispensable service that empowers farmers with knowledge and foresight to improve their agricultural productivity and sustainability.

System 2: Slow and Deliberate Thinking

In contrast to System 1, System 2 represents the more analytical and methodical part of human cognitive processes. Also outlined by Kahneman (2011), this system involves deliberation, critical thinking, and the solving of complex problems. System 2 requires conscious effort and is typically activated when individuals encounter unfamiliar challenges or situations that demand careful consideration and reasoning. It engages in extensive thought processes, enabling a deeper evaluation of evidence and alternative options before reaching a conclusion.

Utilizing the theory of System 2 thinking, we prompted respondents to delve deeper into their responses from the word elicitation exercise. This approach encouraged them to engage in reflective and analytical thought, allowing for a more nuanced understanding of their initial reactions. By facilitating this discussion, respondents could articulate the reasoning behind their associations and provide context for their thoughts. This deeper exploration aimed to uncover the significance of the terms and phrases they provided, revealing underlying beliefs and perceptions related to Shamba Shape Up and iShamba.

The insights gathered from this discussion are as follows.

Shamba Shape Up

Emotional Engagement and Anticipation

One of the most common reactions was excitement and happiness associated with the show. Respondents expressed a sense of anticipation, with one participant stating, "When I hear about Shamba Shape Up, I become so happy because I usually rush to my TV." This highlights the program's ability to engage viewers emotionally, creating a positive association that encourages regular viewership.

Comprehensive and Practical Advice

Respondents praised the program for its actionable content, describing it as a key resource for better farming practices and modern techniques. Comments like, "It provides farming tips and advice," emphasize its role as an educational platform. Specific topics such as marketing advice, crop suitability, and pest management were noted as particularly valuable, showing that the program not only teaches "how-to" techniques but also offers strategic guidance for long-term success.

Expert-Led Credibility

Trust in Shamba Shape Up was closely linked to the presence of experts and relatable demonstrations. A participant noted, "The way they explain things, they sound like experts and that makes me trust them." The inclusion of real farmer experiences further enhanced credibility, with another respondent stating, "Even if an expert tells you what you are supposed to do, sometimes you don't relate with that thing until you see someone doing it."

iShamba

Timely and Practical Applications

iShamba was recognized as a valuable tool for real-time agricultural advice, particularly weather forecasts and farming tips. One respondent stated, "What came to my mind was…[that iShamba] sends weather notifications and answers your questions," underscoring its utility in helping farmers make informed decisions. The platform's integration of localized climate knowledge with actionable advice was seen as critical, guiding practices like rainfall predictions and optimal planting schedules.

Participants remarked on the helpfulness of specific advice, such as recommendations for crop varieties, which led to improved agricultural outcomes, with one farmer stating, "They gave me the best variety of maize seeds…In my area, my maize did better than most farmers."

Responsive Engagement

Farmers appreciated iShamba's timely responses to their queries, which enhanced their confidence in the service. One participant remarked, "It's very reliable in terms of timely response if you ask questions," demonstrating how personalized interactions build trust and loyalty.

Other findings

The common findings are highlighted below:

a) Trust and Credibility

Trust in both platforms was grounded in the accuracy of their information and the tangible outcomes of applying the advice.

As one farmer put it, *"The weather forecasts and the methods they teach about in the shows are true because when you try them out, they work."*

Trust was also cultivated through the responsive nature. Participants commented on the timely responses they received when asking questions, enhancing their confidence in the services.

One participant emphasized, "It's very reliable in terms of timely response if you ask questions," while another noted, *"I believe them because even those who saw me planting early asked how I knew it would rain. I told them I received a message and started preparing my farm."*

b) Scepticism and Cross-Verification

Despite this trust, some respondents expressed scepticism, particularly regarding the precision of weather forecasts. One participant shared, "Sometimes you should check the info they give with other sources," highlighting the importance of cross-verification. Farmers attributed some inaccuracies to natural variability, noting, *"If they predict rain in this area and it rains in a different location, I think they are not wrong."*

c) Regional and Cultural Differences

Kiambu: Farmers displayed greater caution due to negative past experiences. They frequently cross-verified advice and relied heavily on past experiences before adoption.

Nakuru: Farmers were more trusting and proactive in engaging with recommendations. Scepticism about weather forecasts in Nakuru was often influenced by religious beliefs, with some attributing discrepancies to divine intervention.

d) Institutional and Expert Credibility

The association of Shamba Shape Up with Citizen TV enhanced its credibility, with one respondent stating, "I don't think Citizen TV would risk bringing a fraudulent show."

Personalized interactions through iShamba, such as follow-up calls, further reinforced trust, with another participant noting, *"If you see someone who advises you and they follow up, those are people who can be trusted."*

Additionally, the programs filled the gap left by local field officers, gaining trust as crucial resources for farmers, with one farmer noting, *"Shamba Shape Up and iShamba have become our field officers."*

B. Cognitive Mapping

Understanding brand association was further enhanced by the creation of cognitive maps, in which participants visually linked related terms and concepts related to Shamba Shape Up and iShamba to illustrate the connections they made during their thought process. As they constructed these maps, participants articulated the reasoning behind their associations, providing valuable insights into how they perceive and relate different aspects of Shamba Shape Up and iShamba.

This method not only facilitated a deeper understanding of their cognitive frameworks but also allowed participants to explore the intricate relationships between various ideas, fostering a richer dialogue about their experiences and perceptions of the programs. The cognitive maps served as effective tools for capturing complex thoughts and relationships, illuminating the pathways through which participants integrate information and derive meaning from their agricultural practices.

Shamba Shape Up

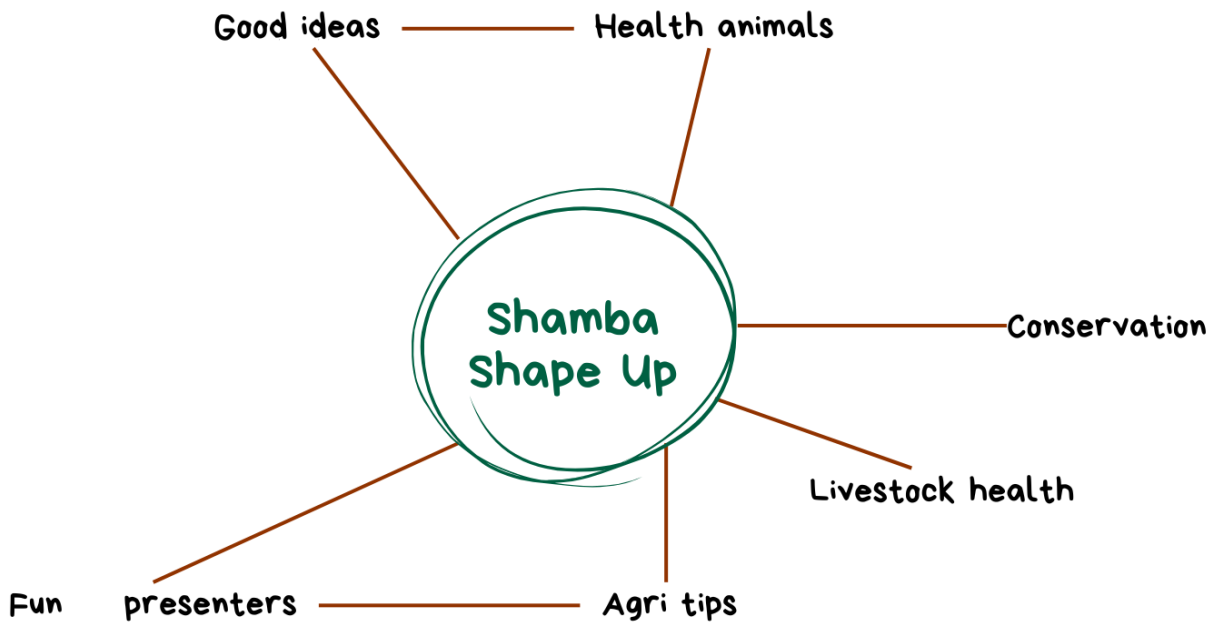


Figure 2.1 Shamba Shape Up Cognitive Map

Positive Associations with Livestock Health
The mapping exercise revealed that respondents linked "good ideas" to "animal health," emphasizing their recognition of the importance of veterinary practices and animal husbandry for successful farming. This connection underscores the program's role in promoting practical solutions that directly contribute to the well-being of livestock.

Engagement Through Entertaining Communication
Respondents associated "fun presenters" with "agricultural tips," highlighting the significance of engaging and relatable communication. Participants appreciated the presenters' lively delivery style, which not only captured their attention but also made the information more memorable and actionable. This underscores the importance of entertainment as a vehicle for effective agricultural education, fostering both interest and information retention.

Active Integration of Knowledge
The cognitive maps demonstrate that participants actively internalize the messages from Shamba Shape Up, connecting theoretical principles like "good ideas" with tangible outcomes such as "health of animals." This active engagement reflects the program's effectiveness in influencing viewers' thought processes, bridging the gap between abstract advice and practical application.

Emotional Resonance and Retention
The association of Shamba Shape Up with words like "fun" underscores its ability to create positive emotional responses among viewers. This enjoyment fosters a sense of connection with the program, enhancing information retention and motivating participants to apply the knowledge in their farming practices.

iShamba

The cognitive maps created by respondents regarding iShamba reveal a well-defined chain of associations, showcasing their understanding of the platform's functionality and its role in supporting interconnected agricultural practices.

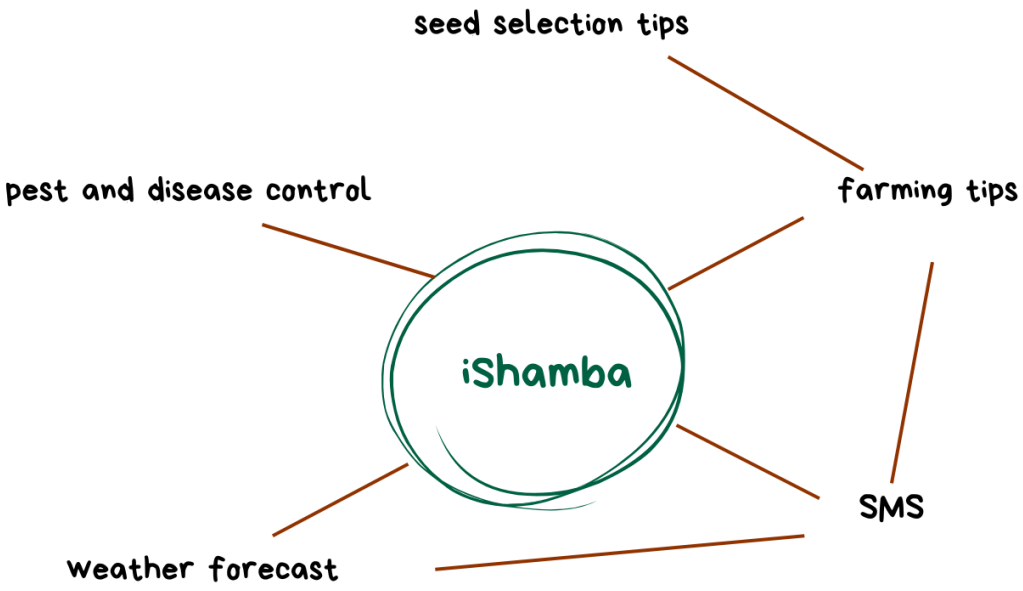


Figure 2.2 iShamba Cognitive Map

Weather Forecasts and SMS Integration
Respondents consistently linked "weather forecasts" with "SMS," highlighting their perception of iShamba as a reliable channel for delivering critical weather information directly to their mobile devices. This connection emphasizes the importance of timely, accessible updates in enabling farmers to plan and adapt their practices to changing climatic conditions.

Farming Tips Delivered via SMS
The association between "SMS" and "farming tips" illustrates respondents' recognition of iShamba's ability to provide practical, actionable advice in a convenient format. This includes guidance on seed selection, a crucial aspect of agricultural decision-making. The emphasis on receiving specific advice, such as seed selection tips, reflects the value respondents place on tailored information that directly addresses their farming needs.

Seed Selection as a Pillar of Farming Advice
By linking "farming tips" to "seed selection tips," respondents demonstrate an appreciation for the pivotal role of choosing appropriate seeds within the broader scope of farming strategies. This insight highlights their awareness of how quality seed selection can significantly impact productivity and sustainability. Furthermore, the connection between seed selection and weather conditions suggests that respondents understand the importance of aligning their choices with climate variability, showcasing a holistic approach to farming.

Practical Implications of Engagement
The cognitive maps indicate that respondents engage deeply with iShamba's content, actively integrating its advice into their agricultural practices. The connections drawn between weather forecasts, seed selection, and farming tips underscore the platform's role in helping farmers make

informed decisions about what to plant, when to plant, and how to optimize resources for better outcomes.

The Appendix provides a comprehensive collection of cognitive maps, further illustrating the range of participant responses.

C. Engagement Behaviour

Respondent engagement with Shamba Shape Up and iShamba reveal distinct patterns and preferences for agro-advisory messaging among Insights gathered from a FGD provide valuable context for understanding engagement levels with Shamba Shape Up and iShamba. In this discussion, participants were presented with a vignette involving a livestock farmer living in their location with a spouse and two children. Living in a simple house with electricity, the farmer typically watches Shamba Shape Up over the weekend. Based on this scenario, respondents answered questions about how they would ideally engage with both Shamba Shape Up and iShamba.

Respondent engagement with these programs reveals distinct patterns and preferences for agro-advisory messaging among livestock farmers. These emphasize the importance of access, content relevance, and interactive elements. This section explores these patterns and preferences in more detail.

TV as Preferred Platform

Respondents widely agreed that TV is the preferred platform for accessing agro-advisory messaging, citing its accessibility, convenience, and potential for family viewing. As one participant explained, "TV is big and convenient… It's good to watch it on TV at home."

This preference can be understood through **cognitive ease**, which suggests that individuals gravitate toward options that require less effort and are more accessible. Television's ubiquity in households and its ability to facilitate collective learning make it an effective medium for disseminating agricultural knowledge. Additionally, family members watching together reinforce each other's understanding, creating a shared learning environment.

Presentation Style

The program's engaging presentation style plays a significant role in viewer retention and comprehension. Respondents appreciated the fun and lively delivery by presenters, which enhanced their ability to absorb and retain information.

This aligns with **cognitive load theory**, which emphasizes the importance of reducing mental effort in learning. However, participants expressed frustration with frequent advertisements and breaks, finding them disruptive. Suggestions to minimize interruptions and improve content flow reflect the need to manage viewer attention spans for sustained engagement.

Family Involvement and Knowledge Sharing

Shamba Shape Up encourages communal learning, with respondents frequently discussing insights with their families and communities. Parents emphasized involving their children in agricultural conversations. One parent remarked, "You introduce them to agriculture bit by bit, and they will come to like it."

This dynamic aligns with **social learning theory**, which posits that individuals learn behaviours and attitudes through observation and interaction. By fostering knowledge-sharing within families and

communities, the program cultivates a collective commitment to farming practices, enhancing both retention and application of the content.

Follow-Up Engagement

Participants expressed a strong interest in engaging with iShamba through SMS for follow-up questions on critical topics such as water conservation, pest control, and crop selection. One farmer noted, "It's very reliable in terms of timely response if you ask questions." This inclination for ongoing dialogue underscores the importance of the feedback loop effect, where timely and relevant responses to inquiries not only enhance farmers' understanding but also motivate them to stay engaged with the content.

This preference highlights the importance of the **feedback loop effect**, where timely and relevant responses build trust and encourage sustained interaction. By facilitating ongoing dialogue, iShamba strengthens its relationship with users, promoting continuous learning and informed decision-making.

Challenges with Scheduling and Content

Scheduling conflicts emerged as a common barrier, with respondents often missing episodes due to community obligations or religious activities. Participants suggested strategies such as flexible replays and enhanced advertising to improve accessibility.

This aligns with **nudge theory**, which suggests that small, strategic adjustments—like reminders or convenient replay options—can significantly influence behaviour. By implementing these changes, Shamba Shape Up and iShamba can foster more consistent engagement among viewers.

Impact and Motivation

The motivational potential of the programs is evident, with participants highlighting the power of relatable success stories and case studies. One respondent remarked, "Highlighting success stories and showcasing farmers who have achieved significant progress inspires viewers to remain engaged."

This reflects the **theory of planned behaviour**, which emphasizes that individuals are more likely to adopt new behaviours when they are influenced by positive role models and perceive the benefits as tangible. By showcasing relatable examples, the programs motivate viewers to implement innovative practices, ultimately driving behaviour change and deepening engagement.

D. Message Effectiveness & Uptake

To evaluate the effectiveness and uptake of messages shared through Shamba Shape Up and iShamba, several key dimensions were assessed: **effectiveness**, **ability**, **desirability**, and **reaction**. These dimensions explore how the platforms influence farmers' behaviour, knowledge retention, sustainability practices, financial empowerment, and resilience-building.

Effectiveness

Participants listed out actions taken after engaging with Shamba Shape Up and iShamba content. These actions have been evaluated against the following measures to analyse effectiveness:

Behaviour Change
Significant adoption of modern farming practices demonstrates the platforms' ability to inspire actionable change. Practices such as artificial insemination, silage preparation, and water harvesting systems were commonly adopted after engagement with Shamba Shape Up and iShamba. Farmers were motivated by relatable and detailed demonstrations of improved structures and techniques, prompting them to enhance their own setups.

One participant noted, *"For me, I did not have a good shed for my cows—they used to lie on mud. After watching Shamba Shape Up, I was able to make the floor and the roof, and so far, so good."* This highlights the effectiveness of practical, relatable guidance in driving meaningful improvements.

Knowledge Transfer

Farmers consistently demonstrated the ability to retain and recall actionable advice from both video and SMS content. The practical applicability of the information was emphasized, with one participant stating, *"The teaching of practical farming and livestock rearing techniques is appreciated and valued for the resulting increased harvests."*

Specific messages, such as weather predictions and planting techniques, were frequently recalled. This aligns with the **principle of relevance**, which suggests that information perceived as directly applicable to a farmer's specific circumstances drives greater motivation and uptake. Positive outcomes from implementing these messages left lasting impressions, reinforcing the perceived value of the advice provided.

Sustainability Impact

The platforms effectively promote sustainable agricultural practices, including the use of organic fertilizers, reduced pesticide application, and renewable energy solutions. Farmers highlighted increased knowledge of composting techniques and their positive impact on productivity.

One participant shared, *"But iShamba educated me on how to make compost manure—mixing leaves from the farm with manure, then covering it for one month. When I used it, my crops like potatoes and cabbages did very well."*

These changes demonstrate the dual benefits of productivity enhancement and alignment with environmental sustainability goals.

Financial Empowerment

Participants reported increased record-keeping and cost optimization because of financial literacy concepts embedded in the platforms' messaging. While farmers may not explicitly label these as financial practices, their implementation reflects improved understanding of cost management and profit maximization.

This shift has also facilitated a transition from subsistence to commercial farming. In poultry farming, for instance, participants adopted better business practices, enabling them to expand their operations and enhance profitability.

Resilience Building

Farmers use of weather predictions for planning farming activities such as planting schedules, harvest timing and silage making demonstrates the platform's success in promoting climate-informed decision making. Participants can rely on weather alerts to keep them informed and some go to the extent of sharing these forecasts with neighbours or friends who currently do not engage with the content.

However, this is highly dependent on the information's reliability as farmers highlighted the inconvenience of the inaccuracy of these weather forecasts. Variance in volume from what is stated, and specific location are aspects farmers noted needed improvement.

Ability

Farmers were asked what motivated them to take specific actions highlighted based on the shows they viewed, giving insight on factors that influence their usage and uptake ability. Based on the responses, we evaluated the motives and enablers that would enhance farmers ability to implement the advice shared.

Enablers

The following factors were identified as motivators for farmers' usage and uptake:

- **Peer Influence and Inspiration**: Farmers are encouraged by the visible success of their peers and featured farmers on SSU. Relatable success stories serve as powerful motivators, fostering confidence to replicate similar practices.
- **Practical Examples and Relatability**: Visual demonstrations, such as improving cow sheds and setting up water harvesting systems, resonate with farmers. Seeing tangible differences between their existing setups and the showcased improvements inspires action.
- **Tangible Benefits and Positive Outcomes**: Noticeable gains in productivity and income empower farmers to transition from subsistence to commercial farming, benefiting their families and livelihoods.
- **Cost-Saving and Financial Benefits**: Adopting efficient practices, such as mulching and using durable maize storage bags, is perceived to save costs and improve resource efficiency.
- **Adaptation to Climate Change**: Resilience-building practices, like planting drought-resistant crops, adopting drip irrigation, and water harvesting, motivate farmers to address climate challenges proactively.
- **Sustainability and Diversification**: Sustainable practices such as crop rotation and silage making are seen as essential for long-term success. Diversification into dairy goats or poultry farming further enhances resilience.
- **Incremental Learning and Improvement**: Farmers value the potential for steady improvement, driven by consistent learning and application of lessons from SSU and iShamba.

Barriers to Usage

Despite these motivators, several barriers hinder farmers' ability to implement desired practices:

- **Frustration from Past Failures**: Negative experiences with failed projects discourage farmers from trying new techniques. Peer influence often reinforces this hesitation, amplifying fear of failure.
- **Resource and Financial Constraints**: Limited access to capital, tools, and materials is a significant barrier, preventing farmers from adopting recommended practices.
- **Environmental Barriers**:
  - *Nakuru*: The dry season restricts practices requiring significant water, such as irrigation.
  - *Kiambu*: Environmental conditions limit the feasibility of certain farming practices in specific areas.
- **Risk Aversion**: Farmers are cautious due to uncertainty about outcomes, especially in resource-intensive practices.

There are multiple risks farmers mentioned that affect their productivity and livelihoods. Theft and security issues are significant concerns, with Nakuru farmers highlighting past experiences of stolen materials or livestock and Kiambu farmers noting crop theft during dry periods, often leading to premature harvesting and reduced quality.

Natural calamities such as droughts, excessive rainfall and flooding also pose challenges, damaging crops and infrastructure, with specific issues like sun damage to farm materials in Kenya and saturation and poor drainage in Kiambu. A knowledge gap in technical expertise, such as feed formulation and farm management, further exacerbates risks. Additionally, economic and financial constraints, including rising material costs and the burden of loans, threaten sustainability. Lastly, climate and environmental risks, such as unpredictable weather and seasonal fluctuations, significantly impact yields and infrastructure.

Desirability

Desirability was explored by asking farmers to rank activities in order of importance, providing insights into their values and decision-making frameworks. The varying rankings reflected the diversity of farmers' goals, resources, and needs. However, several key patterns emerged:

- **Climate Awareness as a Priority**: Climate considerations were consistently ranked as the most important factor, underscoring the role of environmental alignment in decision-making. Farmers prioritized activities like planting schedules and livestock selection based on weather patterns, demonstrating an adaptive mindset influenced by climate variability. This aligns with **prospect theory**, where individuals are driven to minimize potential losses—such as crop failure—by taking pre-emptive measures based on environmental conditions.
- **Agronomic Practices for Optimization**: Planting techniques, crop spacing, and variety selection were also highly ranked, reflecting farmers' focus on maximizing efficiency and outcomes. The emphasis on optimization indicates a preference for practices that yield immediate and measurable benefits, highlighting the importance of **goal-gradient behaviour**, where the perceived proximity to success motivates action.
- **Financial Literacy for Resource Management**: Financial literacy ranked high in importance due to its role in managing limited resources and setting priorities effectively. Farmers' attention to budgeting, cost-saving practices, and profit maximization reflects an informed and pragmatic approach to achieving sustainability, influenced by **self-determination theory**, where autonomy in resource management fosters intrinsic motivation.

These rankings collectively highlight a practical, values-driven approach to improving productivity and sustainability, with decisions grounded in long-term resilience and immediate outcomes.

Reaction

To understand participants' experiences holistically, we explored both the emotional responses tied to their activities and their perceptions of success in achieving their goals.

Emotional Responses

Farmers experience a spectrum of positive emotions tied to their efforts and achievements:

- **Happiness and Gratitude**: Successes in farming activities elicit happiness and gratitude, often attributed to spiritual or divine blessings. This reflects the role of **attribution theory**, where individuals assign external or internal factors as reasons for their outcomes, reinforcing optimism and contentment.
- **Resilience and Hope**: Despite challenges, farmers display remarkable resilience, fuelled by hope and a sense of determination. This perseverance is consistent with **learned optimism**, where positive reinforcement from small successes fosters the belief that effort can overcome adversity.
- **Pride and Self-Reliance**: Farmers take pride in their ability to make progress and provide for their families. Achievements, even small ones, contribute to financial satisfaction and a sense of accomplishment, reinforcing their intrinsic motivation.

Perceived Success

Farmers' perceptions of success vary widely and reflect **subjective goal orientation**:

- **Incremental Success**: Many farmers view partial achievements—such as implementing new practices or observing modest improvements—as steps in the right direction, consistent with **growth mindset theory**, where effort and progress are valued over immediate perfection.
- **Failures as Learning Opportunities**: While some participants view failed outcomes as setbacks, others count the attempt itself as a success, seeing it as a necessary step toward change. This aligns with **attributional retraining**, where reframing failures as opportunities fosters resilience and encourages persistence.
- **External Influences**: Market challenges and environmental factors are recognized as significant external barriers to success, highlighting the interplay between **locus of control** and external conditions. Farmers with a more internal locus view these challenges as manageable through adaptation, while others feel constrained by circumstances beyond their control.

Lessons and opportunities

Despite the increasing availability of agro-advisory services through digital platforms like Shamba Shape Up and iShamba, many farmers encounter obstacles in accessing, interpreting, and applying these messages to their practices. Financial and climate literacy play pivotal roles in influencing farmers' ability and desire to engage with advisory services. Identifying key barriers, along with potential solutions and strategies, provides a comprehensive overview of the issues and opportunities for improvement. Respondents note specific challenges and opportunities for improvement related to these platforms.

Financial Literacy

Financial literacy encompasses farmers' understanding of credit, savings, budgeting, and navigating financial systems such as loans and subsidies. For Shamba Shape Up and iShamba, financial literacy is a key area for empowering farmers to make informed decisions about resource allocation and investment.

Respondents identified both challenges in understanding and applying financial advice provided by these platforms and opportunities for improving the clarity, practicality and relevance of financial content. By addressing these gaps, Shamba Shape Up and iShamba can strengthen their position as trusted financial advisors for farmers.

Limited Institutional Support:
Farmers reported feeling unsupported by financial institutions and government bodies. Limited access to affordable credit and subsidies, combined with heavy taxation and inadequate protections, restrict their ability to act on financial advice. This reflects **system justification theory**, where individuals view systemic barriers as unchangeable and disengage from potential solutions. Farmers emphasized that financial advice, while well-intentioned, feels futile without addressing these broader structural constraints.

Selective Trust:
Scepticism toward government-driven financial initiatives stems from unfulfilled promises and perceptions of misinformation. This **confirmation bias** leads farmers to discount advice associated with less-trusted entities. While Shamba Shape Up and iShamba enjoy higher credibility, their reliance on external systems, such as banks or government programs, reduces the perceived practicality of their financial advice.

Loans and Credit Accessibility:
High interest rates, complex loan terms, and a lack of understanding about credit processes deter farmers from accessing financial services. This aligns with **cognitive overload theory**, as the complexity of navigating financial systems creates a barrier to action. Small-scale farmers feel excluded from opportunities, perceiving the system as hostile to their needs.

Based on the above, following **opportunities** were identified to address these barriers:

1. **Comprehensive Financial Management Training**:
   Farmers expressed a desire for practical guidance in areas such as record-keeping, budgeting, and financial planning. Behavioural science principles like **self-efficacy theory** suggest that equipping farmers with actionable tools and demonstrating incremental success can build their confidence in managing finances. Tailored workshops or digital tutorials that break down complex concepts into simple, actionable steps would address gaps in financial literacy.
2. **Simplifying Financial Jargon**:
   Farmers need accessible explanations of financial concepts such as loan terms, interest rates, and repayment schedules. Using **cognitive load theory**, Shamba Shape Up and iShamba can present financial advice in visually clear formats, such as infographics or relatable examples, to reduce complexity and foster understanding. Simplification not only makes information more actionable but also strengthens trust in the platforms as reliable advisors.

"Sometimes the information we get on financial issues is commercial and not farmer friendly"

Respondent, Thika (Kiambu)

3. **Setting Realistic Expectations:**
   Exaggerated promises in agro advisories are not found useful by farmers, who emphasized the importance of feasible recommendations with reasonable expectations for return on investment.

"iShamba and Shamba Shape Up should have a program of educating farmers on the income to expect after the cost of production. This is what we call agribusiness."

Respondent, Kiambu

Regional differences: Kiambu farmers emphasize that financial literacy is often driven by necessity, with many proactively seeking information to address immediate financial constraints. They also stress the importance of understanding market trends to avoid oversaturation and maximize profits. While they express interest in innovations like mechanization, high costs and lack of government support are seen as significant barriers. Farmers in Nakuru express interest in exploring alternatives to mobile

money platforms for better returns and propose diversifying income sources as a strategy to mitigate the risks associated with agricultural unpredictability.

Climate Literacy

Climate literacy refers to farmers' ability to understand and apply weather forecasts, adopt climate-resistant practices, and plan for climate variability. Climate change has a profound impact on Kenya's livestock sector, particularly through changes in temperature and rainfall patterns. These climate shifts, part of larger global trends, have led to more frequent droughts, especially in semi-arid regions. This has resulted in degraded pastures and significant livestock losses, highlighting the sector's vulnerability to climate variability (Recha, 2018).

Shamba Shape Up and iShamba play a significant role in improving farmers' climate literacy by providing actionable weather-related advice and demonstrating adaptive farming techniques. However, respondents highlighted gaps in the relevance, accuracy, and depth of climate content provided by these platforms, offering opportunities for improvement.

Accuracy

Inconsistency in accurate weather forecasting from Shamba Shape Up and iShamba undermines confidence in their climate advice and future forecasting, a significant deterrent for farmers in acting according to predictions. According to **expectancy theory**, farmers are less likely to act on advice if they perceive the predicted outcomes as unreliable or unattainable.

"They send messages saying that it will maybe rain 3mm from this day to this day. Sometimes we wait for the rain for too long and maybe I had even put seeds on the ground. When it doesn't rain, the seeds on the ground go to waste."

Respondent, Thika (Kiambu)

Limited Localized Information:
Farmers highlighted that the platforms often fail to provide region-specific advice, reducing the relevance and applicability of the information. **Tailored messaging theory** suggests that personalized, localized information is more effective in motivating behaviour change, as it resonates with the specific needs and circumstances of the audience.

Lack of Hands-On Training:
Farmers expressed frustration over the lack of practical, on-ground training to prepare for changing weather conditions. They feel that conferences and summits fail to address their immediate needs due to limited direct engagement. The absence of **experiential learning opportunities**, where farmers can practice adaptive techniques firsthand, diminishes their ability to translate knowledge into action.

Based on the above, following **opportunities** were identified to address these barriers:

1. **Workshops for Climate Education**:
   Actionable training programs tailored to specific regions could provide farmers with hands-on experience in adaptive practices. Such workshops would foster **self-efficacy**, enabling farmers to feel more confident in their ability to manage climate challenges.
2. **Tailored Content**:
   Localized weather predictions and crop-specific advice are highly valued by farmers. Including local farmers from various regions in Shamba Shape Up and iShamba episodes could increase relatability and trust. This aligns with **social proof**, where seeing peers from similar regions adopt successful strategies encourages others to follow suit.
3. **Promotion of Resilient Farming Practices**:
   Demonstrating techniques like cultivating drought-resistant crops and implementing water conservation methods on Shamba Shape Up would provide farmers with practical tools to adapt to climate challenges. The inclusion of **modelling behaviour** through visible demonstrations by successful farmers or experts helps bridge the intention-action gap.
4. **Improved Climate Planning**:
   Developing long-term climate projections and an annual climate calendar could enhance farmers' ability to anticipate and prepare for seasonal changes. **Temporal framing** can influence decision-making by helping farmers visualize the long-term benefits of adaptive actions, motivating them to invest in preparation.

Regional differences

Farmers in Kiambu identified financial barriers to adopting climate adaptation measures, such as water harvesting systems and biogas solutions. While they recognize the importance of these measures, they view them as unaffordable without access to subsidized loans or other financial support.

Farmer suggestions

Farmers provided several actionable recommendations to enhance the reach, usability, and relevance of Shamba Shape Up and iShamba. These suggestions reflect the need for inclusive, accessible, and region-specific content delivery.

Expanding Platforms

Farmers rely on a variety of platforms, including TV, radio, YouTube, community networks, and government campaigns, for agro-advisory knowledge. Leveraging these diverse channels can significantly broaden the programs' reach and engagement.

- **YouTube Accessibility**: Uploading Shamba Shape Up episodes on YouTube can address issues of inconsistent TV and radio networks, ensuring farmers have on-demand access to content.
- **Community Networks**: Collaborating with farmer groups and local community organizations can extend the programs' reach to areas with limited digital access.
- **Radio Integration**: Radio segments can offer shorter, targeted advice, ensuring accessibility for farmers with limited time or access to visual media.

Evening Airing

Many farmers are unavailable during the day due to work or church commitments. Adding an evening airing slot to Shamba Shape Up's schedule can increase viewership by accommodating diverse schedules.

Extended Program Length

The current thirty-minute Shamba Shape Up program is viewed as insufficient, with farmers advocating for longer episodes. They also suggest providing the unedited and more detailed version of the episode on YouTube for broader access.

Localized Content

Farmers seek localized weather forecasts, advice on diverse crops like avocado, and information on region-specific environmental factors such as pests. They also suggest rotating Shamba Shape Up content across counties to cover a broader range of regions.

Simplified Formats

Farmers in Kiambu expressed a preference for simplified tools, such as SMS-based questionnaires, over complex systems or apps. Adopting straightforward, SMS-based interactions aligns with farmers' needs for accessible, non-technical solutions.

> "They should simplify it because we are farmers and not Gen Zs."
>
> *Respondent, Thika (Kiambu)*

The challenges and opportunities outlined in this study underscore the complex dynamics shaping farmers' engagement with Shamba Shape Up and iShamba, particularly in the areas of financial and climate literacy. While barriers such as institutional distrust, limited localized content, and financial constraints hinder farmers' ability to access and utilize the platforms effectively, significant opportunities exist to address these gaps through tailored interventions.

By fostering trust through clear, realistic messaging, simplifying complex concepts, and providing actionable, region-specific guidance, Shamba Shape Up and iShamba can better equip farmers to navigate financial and climate-related challenges. Moreover, leveraging diverse platforms and enhancing program accessibility through extended airtime, localized content, and farmer-centric tools can further strengthen outreach and engagement. Addressing these critical areas through inclusive, participatory approaches has the potential to empower farmers, enhance resilience, and ultimately drive sustainable agricultural development in Kenya.

Conclusion

This study employed a qualitative approach to investigate the effectiveness of digital agro-advisory messaging disseminated through Shamba Shape Up and iShamba in Kenya. The research focused on livestock farmers in Kiambu and Nakuru counties, utilizing FGDs, free word elicitation, cognitive mapping, vignettes and probes to explore farmers' perceptions, engagement patterns, effectiveness, challenges and opportunities when interacting with these platforms.

Key Findings

Both Shamba Shape Up and iShamba are valued by farmers. Television remains the most preferred access point due to its convenience and suitability for family viewing, aligning with the principle of cognitive ease. However, scheduling conflicts and advertising negatively affect consistent engagement. iShamba provides timely, relevant information, particularly weather updates, influencing farmers' planning and decision-making; however, trust in the accuracy of weather forecasts is variable, influenced by both practical experience and, in Nakuru, religious beliefs.

Both platforms are valued for their practical, actionable advice, especially on topics relevant to farmers' specific contexts, aligning with the **Theory of Planned Behaviour**. Trust in both platforms is influenced by expert involvement, demonstrable results, responsive communication, and the reputation of Citizen TV. Farmers in Kiambu displayed greater caution and a greater need for information verification compared to Nakuru. Financial literacy emerged as a major barrier, particularly in Kiambu.

Recommendations

Based on the findings of this study, several key recommendations emerge to enhance the effectiveness and impact of Shamba Shape Up and iShamba in supporting livestock farmers. These recommendations focus on optimizing content, improving platform functionality, addressing financial literacy challenges, enhancing communication strategies, and leveraging the success of practical demonstrations.

Optimize Content and Scheduling

Enhance content relevance and tailor information to specific regional contexts. Consider alternative scheduling options, such as evening broadcasts or more readily accessible and longer online content, to improve accessibility and increase engagement. Reduce the number of adverts.

Improve iShamba Functionality

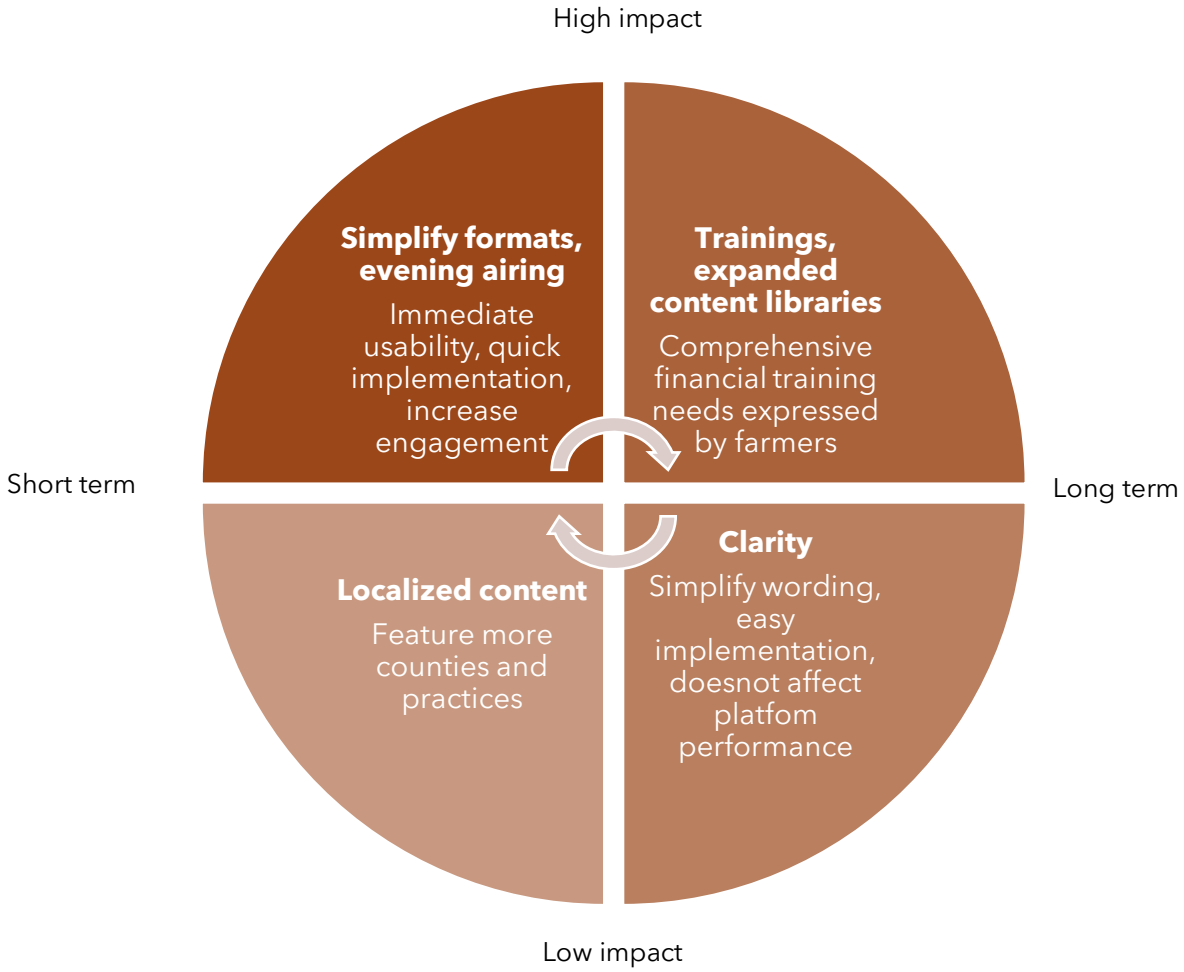
Simplify the platform's interface for enhanced usability, particularly in Kiambu where a preference for simple SMS-based questionnaires was expressed. Ensure timely and personalized responses to farmers' inquiries.

Address Financial Literacy Gaps

Develop targeted financial literacy training and resources to empower farmers to make informed financial decisions and promote investment.

Enhance Weather Forecast Communication

Address concerns regarding the accuracy and reliability of weather forecasts. Consider integrating local knowledge and religious beliefs in communicating the forecasts.



Further Research

Apart from increasing the sample size for the current study, to further advance understanding of the impact and effectiveness of Shamba Shape Up and iShamba, several avenues for future research are recommended:

Quantitative Impact Assessment

To complement qualitative research, conduct a rigorous quantitative study to precisely measure the impact of Shamba Shape Up and iShamba on key agricultural outcomes. This should include assessing changes in crop yields, livestock productivity, farmer income, and overall household livelihoods. The study could explore correlations between specific program elements (e.g., type of messaging, frequency of interaction) and impact to understand best practices.

Comparative Messaging Strategy Analysis

Explore the effectiveness of various messaging strategies and channels on farmer behaviour change. A comparative analysis could evaluate the impact of different communication styles (e.g., storytelling vs. direct instruction), message framing (e.g., gain-framed vs. loss-framed), and delivery channels (e.g., SMS, radio, TV, social media) on knowledge acquisition, attitude shifts, and the adoption of new farming practices.

Social Networks and Community Influence

Investigate the role of social networks and community interactions in shaping farmers' perceptions and engagement with the programs. Qualitative research methods, such as in-depth interviews and ethnographic studies, could shed light on how information spreads within communities, how social norms influence decision-making, and how peer-to-peer learning impacts adoption of new agricultural practices. Analysing the dynamics of information sharing across social networks will help optimize outreach and engagement strategies.

Gender Analysis

Conduct a dedicated study to assess the impact of Shamba Shape Up and iShamba on gender equity within farming communities. The study could focus on whether women and men differentially access, utilize, and benefit from the programs, examining the gendered aspects of knowledge gaps, financial access, decision-making power, and overall participation in agricultural improvement.

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Appendix

Word Cloud by Location

Figure 3.1 Nakuru County -Shamba Shape Up Word Cloud

Figure 3.2 Nakuru County -iShamba Word Cloud

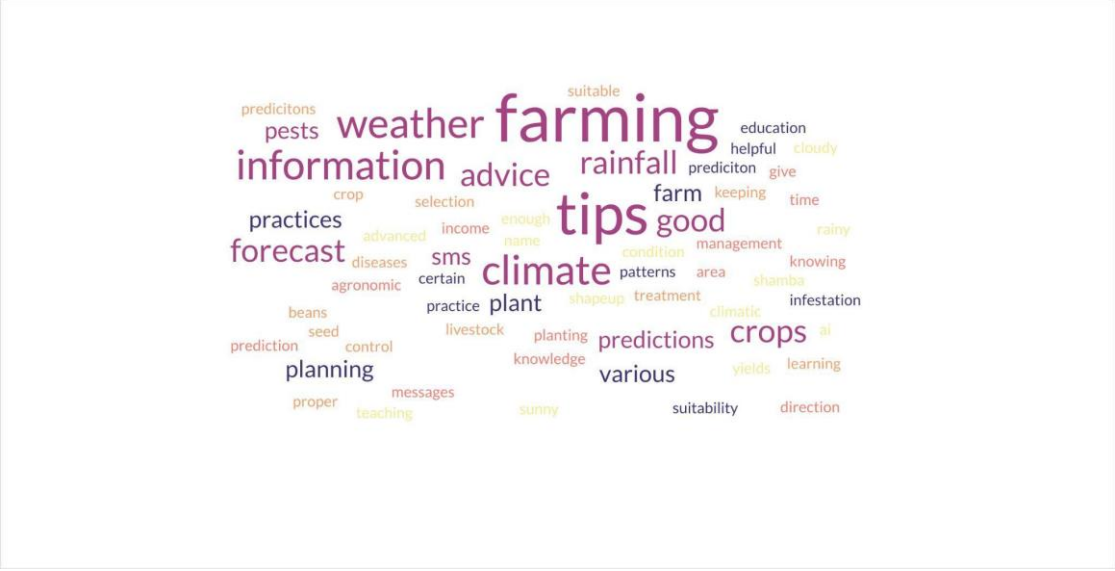
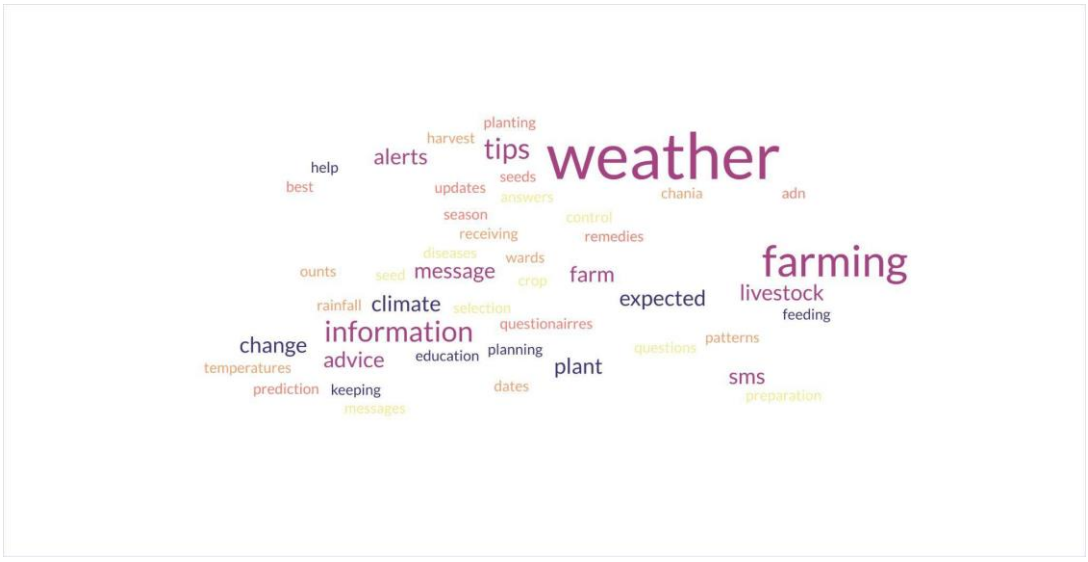


Figure 3.3 Kiambu County -Shamba Shape Up Word Cloud

Figure 3.4 Kiambu County -iShamba Word Cloud



Cognitive Maps from Participants

Figure 4.1: Combined-Cognitive Map 1

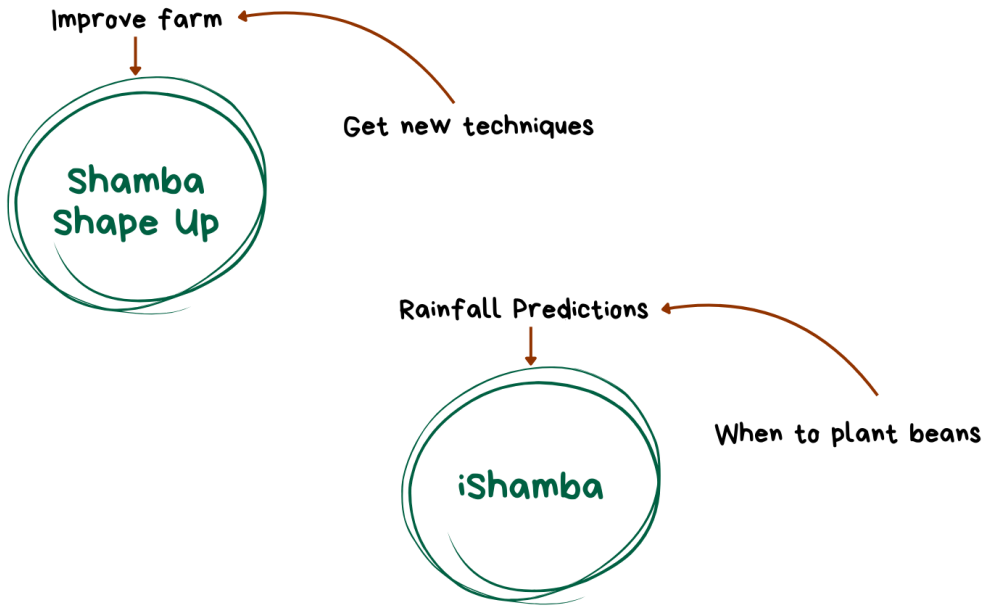


Figure 4.2: Shamba Shape Up-Cognitive Map 2

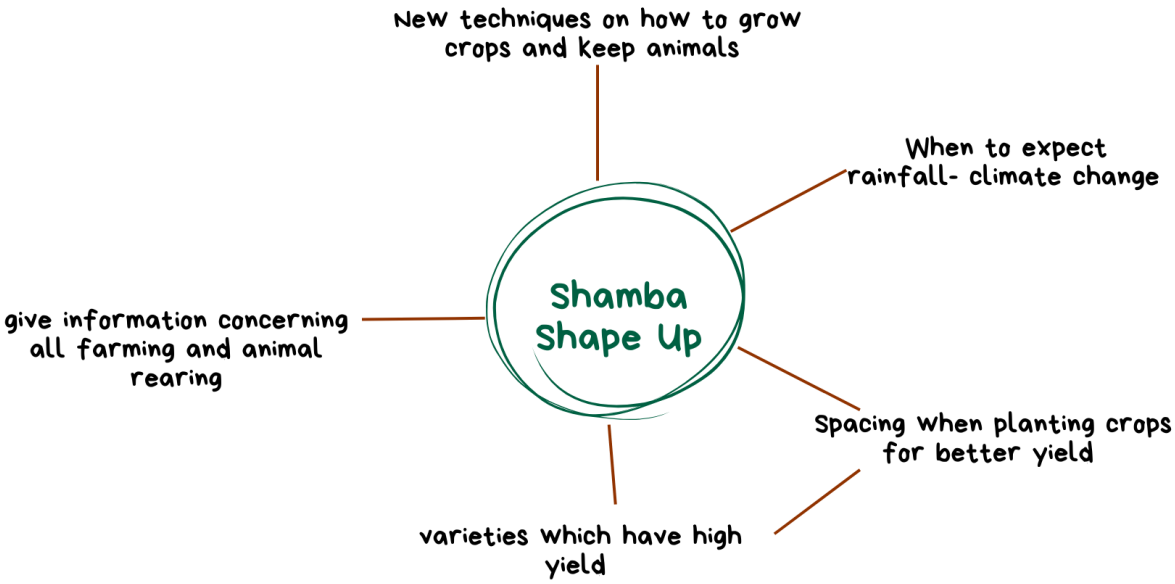
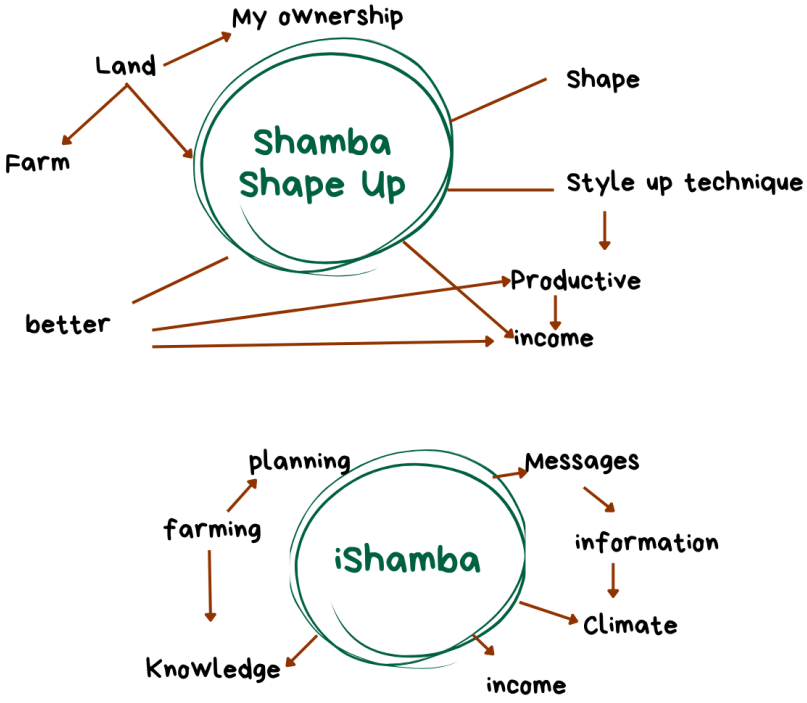
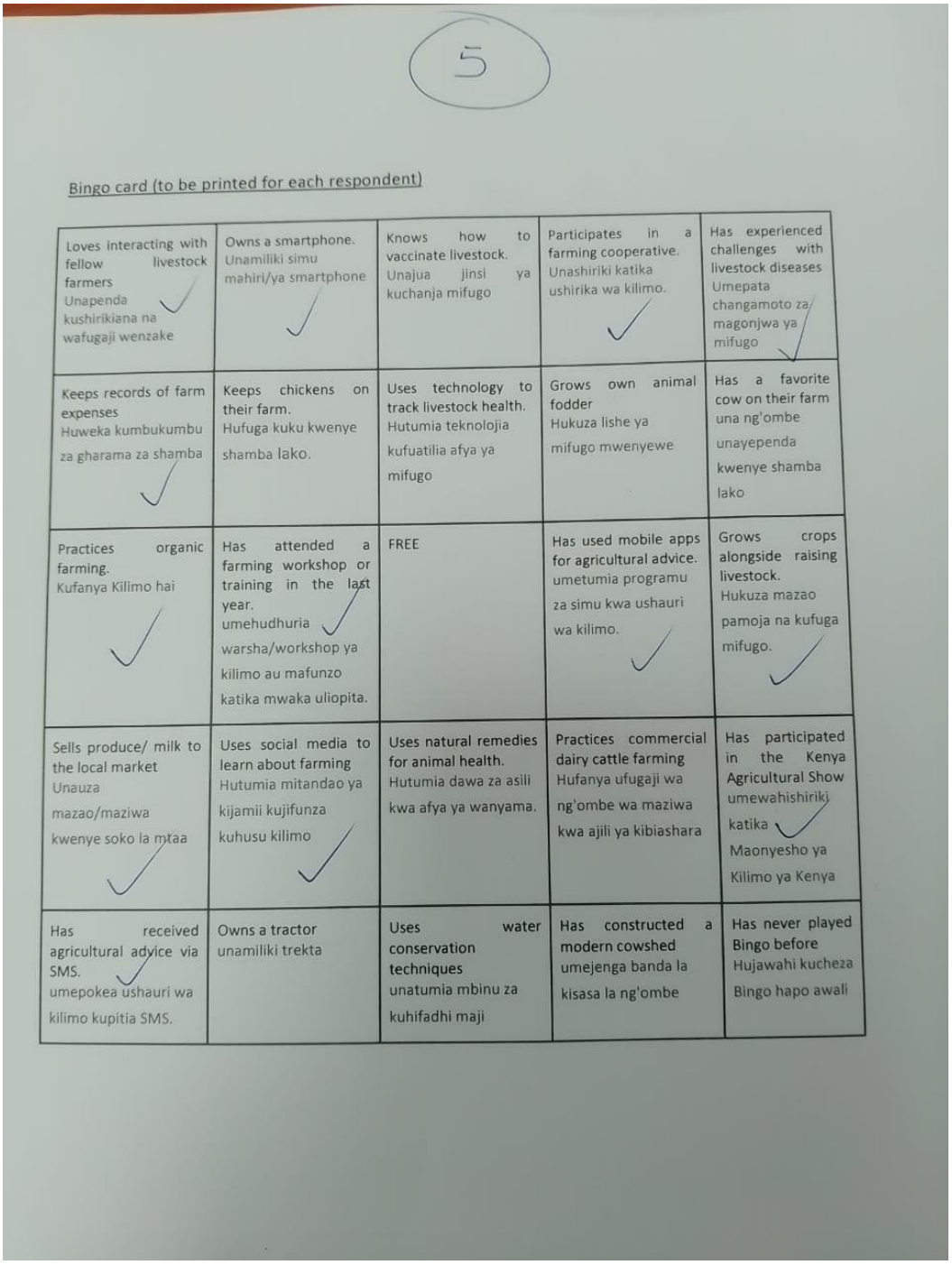


Figure 4.3: Combined-Cognitive Map 3



Following are some images from the fieldwork:



5

Bingo card (to be printed for each respondent)

Loves interacting with fellow livestock farmers Unapenda kushirikiana na wafugaji wenzake	Owns a smartphone. Unamiliki simu mahiri/ya smartphone	Knows how to vaccinate livestock. Unajua jinsi ya kuchanja mifugo	Participates in a farming cooperative. Unashiriki katika ushirika wa kilimo.	Has experienced challenges with livestock diseases Umepata changamoto za magonjwa ya mifugo
Keeps records of farm expenses Huweka kumbukumbu za gharama za shamba	Keeps chickens on their farm. Hufuga kuku kwenye shamba lako.	Uses technology to track livestock health. Hutumia teknolojia kufuatilia afya ya mifugo	Grows own animal fodder Hukuza lishe ya mifugo mwenyewe	Has a favorite cow on their farm una ng'ombe unayependa kwenye shamba lako
Practices organic farming. Kufanya Kilimo hai	Has attended a farming workshop or training in the last year. umehudhuria warsha/workshop ya kilimo au mafunzo katika mwaka uliopita.	FREE	Has used mobile apps for agricultural advice. umetumia programu za simu kwa ushauri wa kilimo.	Grows crops alongside raising livestock. Hukuza mazao pamoja na kufuga mifugo.
Sells produce/ milk to the local market Unauza mazao/maziwa kwenye soko la mtaa	Uses social media to learn about farming Hutumia mitandao ya kijamii kujifunza kuhusu kilimo	Uses natural remedies for animal health. Hutumia dawa za asili kwa afya ya wanyama.	Practices commercial dairy cattle farming Hufanya ufugaji wa ng'ombe wa maziwa kwa ajili ya kibiashara	Has participated in the Kenya Agricultural Show umewahishiriki katika Maonyesho ya Kilimo ya Kenya
Has received agricultural advice via SMS. umepokea ushauri wa kilimo kupitia SMS.	Owns a tractor unamiliki trekta	Uses water conservation techniques unatumia mbinu za kuhifadhi maji	Has constructed a modern cowshed umejenga banda la kisasa la ng'ombe	Has never played Bingo before Hujawahi kucheza Bingo hapo awali

Shalika Vyas, Research specialist, s.vyas@cgiar.org

CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land, and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. www.cgiar.org

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