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USING DIGITAL TECHNOLOGIES TO CO-CREATE COLLABORATIVE FUTURES FOR PARTNERSHIPS: CROSS-SECTOR PARTNERSHIPS USING ANIMATED VIDEOS TO IMPROVE RWANDAN AGRICULTURAL EXTENSION SERVICES

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Abstract

This paper presents a descriptive analysis of an agricultural e-extension partnership between the Rwanda Agriculture and Animal Resources Development Board (RAB) and Scientific Animations Without Borders (SAWBO), examining the potential of digital tools for the future of agricultural extension efforts. The collaboration integrates SAWBO's animated videos into Rwanda's agricultural systems, enhancing access to knowledge and extending outreach to rural communities. Drawing from the traditional Rwandan practice of *Umuganda* (community service), Riane Eisler's cultural transformation theory, and co-production perspectives, the RAB / SAWBO partnership utilizes culturally relevant methods for community engagement, demonstrating the value of traditional practices for modernizing enhanced digital outreach. This analysis foregrounds the concept of "informationalization," in which digital information and communication technologies (ICTs) become central to sustainable development, as a means of bridging infrastructural and socioeconomic gaps in agricultural extension. The authors argue that the future of effective partnerships in agricultural development must prioritize participatory, non-domination frameworks and adaptive learning, especially in complex cross-sectoral collaborations that address evolving challenges like climate change impacts on food security and pest management. Per co-production and cultural transformation theory, the paper advocates for partnerships that are prepared to respond to emergent information, while being embedded in culturally legible structures. By envisioning a future where partnerships are institutionalized across sectors, the paper underscores the potential for sustainable long-term transformations of culture through collaborative digital platforms that accommodate evolving technologies and local needs.

Keywords: agricultural extension; ICTs; Rwanda; co-production; virtual partnerships

Introduction

If it is a settled matter that partnerships are essential for fostering innovation, sustainability, and development across sectors, those partnerships' hierarchical organization, distribution of decision-making and agenda setting, and allocation of responsibilities between parties are less settled matters (e.g., cooperation, collaboration, coordination, or command; c.f., Adsanver, Balcik, Bélanger, & Rancourt, 2023; Castañer & Oliveira, 2020). As a contributor to this issue of the *Interdisciplinary Journal of Partnership Studies*, we advocate for non-domination partnerships (Eisler, 1994), even in steeply hierarchical situations (Anne Namatsi Lutomia, Bello-Bravo, Medendorp, & Pittendrigh, 2020). These situations can afford parties access to participatory decision-making and agenda-setting especially as these directly affect them (Antunes, Santos, & Videira, 2006), and a just allocation of responsibilities (Bello-Bravo, Medendorp, & Pittendrigh, 2022).

For agricultural extension, partnerships are essential, especially for addressing the growing complexity and interrelatedness of food production, environmental sustainability, and farmers' access to knowledge. In this paper, we offer a descriptive analysis of an agricultural e-extension partnership, presenting its process and outcomes mainly to illustrate the interaction as one form of the future of partnership. This is especially relevant in the current digital age, when the capacity to reach billions of people with life-improving information is now arguably technically within reach (Bello-Bravo, Medendorp, Lutomia, & Pittendrigh, 2023c). What remains is to determine how to *socially* implement that reach so that it engages and empowers the majority of the world's population (Bello-Bravo, Medendorp, Lutomia, et al., 2022). Partnerships will be an indispensable aspect of those efforts (Anne Namatsi Lutomia, Bello-Bravo, & Pittendrigh, 2018).

Background

Throughout this paper, we use the words partnership and collaboration interchangeably. When referring to these terms, we mean a process where (1) entities share information, resources, and responsibilities (2) to jointly plan, implement, and evaluate a program for common goals, (3) in a manner that justly acknowledges and distributes agency (acting power) between the parties. Central to these partnership collaborations or collaborative partnerships is *experiential learning*; that is, over the time of the parties' interaction, their behaviors, procedures, and even the goals of the partnership are not just liable to change but are already prepared when new information emerges.

This willingness to learn is not just a critical check on the tendency of domination model stakeholders to be non-responsive, dismissive, or even punitive about input from 'junior' or 'subordinate' members in a partnership. Without this flexible, adaptive, and creative responsiveness to emerging data, it is much more difficult (if not impossible) to innovate, develop sustainable solutions to problems that people will take up, or achieve collaborative partnerships generally. Literature on agricultural development partnerships emphasizes collaboration between governments, non-governmental organizations (NGOs), private entities, and local communities as a pathway to enhance resource allocation, knowledge dissemination, and technology adoption (Byerlee, De Janvry, VanWassenhove, & Barry, 2009; Sartas, Schut, Hermans, Asten, & Leeuwis, 2018). Relatedly, partnerships focusing on agricultural extension can help overcome resource constraints and infrastructural gaps, particularly in developing countries (Maryono, Killoes, Adhikari, & Aziz, 2024; Rivera, 2011; Thiele et al., 2011).

In particular, digital (virtual) partnerships have gained traction as they offer novel opportunities for information dissemination. These include providing smallholder farmers not only with accessible and timely resources via mobile and web-based platforms (Aker, 2010; Kabirigi, Sekabira, Sun, & Hermans, 2023; Tata & McNamara, 2018) but also with remote multi-institutional coordination that would otherwise be

precluded by travel expenses, people's schedules, or impacts like the COVID-19 pandemic's shelter-in-place mandates. Nevertheless, investigating how in-person and online collaborations develop and use such resources offers significant potential for insights to identify more effective synergies and to sustain longer-term partnerships through routine, now more cost-effective, joint efforts.

An Innovative Partnership

Scientific Animations Without Borders (SAWBO) and Rwanda's Agriculture and Animal Resources Development Board (RAB) partnered in a collaboration to apply benefits of digital educational tools for the future of agricultural extension efforts, by integrating SAWBO's animated videos into Rwanda's agricultural systems, enhancing access to knowledge and extending outreach to rural communities. The collaboration arose out of a recognition of three crucial limitations: (1) traditional methods for providing agricultural extension services, (2) the increasing shift towards digital media consumption, and (3) the potential of animated videos to reach additional audiences.

Accordingly, RAB partnered with SAWBO in 2022 to develop a working relationship, strategy, and platform to incorporate digital animations into existing agricultural extension systems in Rwanda. The purpose of initiating this collaboration was to more effectively integrate future-oriented, digital resources into the country's existing agricultural extension toolkit and to provide up-to-date, accurate agricultural information to extension service providers.

On its face, this SAWBO / RAB partnership reflects a globally ongoing "modernization" effort to draw on digital information and communication technologies (ICTs) and their infrastructures to pivot development more toward *informationalization* than *industrialization* (Farrar, 1994; Zhang & Jia, 2010). Informationalization refers to an increasing reliance on ICTs to collect, process, store, and disseminate data and other information (Zhang & Jia, 2010). It underscores how societies, organizations, and/or economies can shift from traditional, industrial models, even 'hopscotching' over full

industrialization to integrate socioeconomics that prioritize the flow and management of information as a key resource. By leveraging the now-global reach of ICTs (especially mobile phones) and the Internet (Bello-Bravo et al., 2021), the SAWBO / RAB partnership sought to informationalize access to agricultural information to support farmers more effectively and augment the 1:840 ratio of extension service agents in Rwanda (Musabyimana & Ranganathan, 2019).

While informationalization is indisputably an aspect of the future of partnerships, continuities with the past remain a part of those future/emergent processes as well. For example, the SAWBO / RAB partnership grew out of pre-existing relationships between SAWBO team members and RAB. SAWBO was also concurrently funded by the U.S. government under a collaborative project led by the International Institute for Tropical Agriculture (IITA) with the International Center for Tropical Agriculture (CIAT) as a consortium partner. Both IITA and CIAT have a long history of working with RAB.

RAB is an agency of the Rwandan Ministry of Agriculture and Animal Resources, whose overarching mission is to lead the transformation of Rwanda's agriculture sector into a modern, knowledge-based, technology-driven, market-oriented industry (Musabyimana, 2018; Rwandan Agriculture Board, 2023). RAB focuses on improving agriculture and livestock through research, extension, and technology. Its main responsibilities include implementing national policies, conducting research, controlling diseases, promoting technology, overseeing seed production, and providing extension services. It also collaborates with decentralized entities, cooperatives, NGOs, and private organizations to drive agricultural development. This partnership-based approach improves impact across all regions, boosts productivity, and improves the quality of agricultural and animal resources products (Rwandan Agriculture Board, 2024).

Publicly launched in 2011, SAWBO is a U.S. university-based program that specializes in lowering the transactional costs of moving empirically validated, life-improving basic research through solution development, distribution, and local uptake and adaptation

using locally translated animated educational videos (Bello-Bravo, Medendorp, Lutomia, et al., 2022). With a designed capability to engage and empower knowledge retention and solution uptake in people regardless of age, gender, education, technological literacy, or geographic location (Bello-Bravo et al., 2020; Bello-Bravo, Tamò, Dannon, & Pittendrigh, 2018; Medendorp et al., 2022), the animated videos also have a *decreasing* unit cost to mass-upscale (Bello-Bravo, Medendorp, Lutomia, et al., 2022) and are highly cost-effective to modify when video recipients or other stakeholders request modifications (Bello-Bravo, Medendorp, Lutomia, & Pittendrigh, 2023a; Medendorp et al., 2022).

Both the institution of SAWBO and its animated videos were conceived, researched, designed, and implemented with the UN's Sustainable Development Goals (SDGs) in mind (including SDG17, Partnerships). They were geared especially for the 'hard mode' context of Africa, where rich multicultural and multilingual histories are impacted by straitened resources, national economies still deeply rooted in agriculture, and technologically limited access to education and information (Rodríguez-Domenech et al, 2023). Ultimately, this gearing also required a built-in collaborative readiness to learn institutionally when emergent information appeared.

THEORETICAL FRAMEWORK

This paper's view of the future of partnerships is anchored in the traditional Rwandan practice of *Umuganda* (community service) (Rwanda Governance Board [RGB], 2023), and more recent frameworks of Riane Eisler's (2015a) cultural transformation theory, and co-production (Mercanti, 2011). These approaches offer a braided philosophy, theory, and method for understanding the RAB / SAWBO collaboration. Taken together, they demonstrate a non-dominator partnership grounded in trust and mutual respect.

Umuganda: Coming Together with a Common Purpose to Achieve a Goal

Rwanda provides a unique setting in which to engage in partnership due in part to the prominent role of *Umuganda*, a nationally mandated community volunteer practice

comprising part of the country's socioeconomic development and governance. *Umuganda* is a traditional Rwandan practice rooted in community work and cooperation. Originating from indigenous Rwandan values of mutual assistance and social responsibility, the term *Umuganda* translates to "coming together with a common purpose to achieve a goal," which highlights the essence of collective effort (Rwandan Governance Board, 2023).

Over time, *Umuganda* has evolved from an informal communal labor system into a formalized national policy as a crucial pillar for infrastructure development and social cohesion (Uwimbabazi, 2012). In contemporary Rwanda, *Umuganda* is institutionalized as a monthly event where community members gather on the last Saturday of each month to engage in activities such as cleaning streets, constructing public facilities, and environmental conservation (Kauzya, 2023). *Umuganda*'s role in reforestation efforts and agricultural rehabilitation, for example, demonstrates its contribution to addressing environmental challenges and sustaining rural livelihoods (Bambujijumugisha, 2016; Bates, 2012). The economic impact of *Umuganda* is also substantial, with its contributions to national development projects including the construction of schools, medical centers, and hydroelectric plants, estimated at over US $60 million since 2007 (Bambujijumugisha, 2016).

From a governance perspective, *Umuganda* enables the implementation of *co-productive partnerships* (defined in more detail below) by facilitating interaction between citizens and government officials while fostering social cohesion and accountability. It empowers local communities to participate in planning and executing development initiatives, aligning with Rwanda's broader goals of poverty alleviation and sustainable development (Bates, 2012). The nationally mandated community work program also serves as a platform for community members to voice concerns and propose solutions to pressing social issues, reinforcing its function beyond physical labor alone. Discussions during *Umuganda* often focus on social matters within the community, including misbehavior and child neglect, providing a space for fostering

accountability and collective problem-solving (Flinkenflogel et al., 2015; Rwandan Governance Board, 2023).

Umuganda functions in the SAWBO / RAB partnership as a crucial tool for community engagement and knowledge dissemination. As a traditional Rwandan practice of collective action, *Umuganda* aligns with the goals of SAWBO and RAB as a future-oriented collaboration for capacity-building in rural communities. Using *Umuganda* to showcase SAWBO's educational videos, RAB facilitates direct interactions with local farmers, promoting behavior change and agricultural improvements. This culturally integrated approach amplifies the effectiveness of the partnership, embedding modern technology in a familiar social structure.

Drawing on this local, traditional practice is not merely strategic. Certainly, its instrumental utility helps position future partnership solutions in ways that are culturally familiar and thus require less 'overhead' in terms of learning and behavioral change. And, as emphasized below, this also supports greater ease when translating those solutions into culturally viable forms as well as support for the continuity of local, traditional, indigenous knowledge and practices. *Umuganda* is a pro-social, community-oriented tradition that fosters sustainability and social continuity. Honoring, rather than supplanting, that knowledge and practice resists top-down, dominator paradigms and fosters relation and collaboration horizontally (the partnership paradigm).

Co-Production and Cultural Transformation Theory

Co-production is a mode of production in which multiple entities function together to produce an output jointly. Public services are co-produced by private and public entities when each member of the partnership contributes to the provision of the service — whether by contributing in material ways, such as by providing labor, supplies, or financial support, or through contributions of knowledge, experience, and access to social networks (Loeffler, 2021a, 2021b; Ostrom, 1996). Co-production is characterized by the public's active participation in service provision, as well as a balanced power dynamic between public agents and the lay public, contributing to a relationship that

is egalitarian and democratic (Eisler, 2015a). In recent years, co-production has grown in popularity among public administrators to increase the efficacy of public programs and services because "the production of a service…[is] difficult without the active participation of those supposedly receiving the service" (Ostrom, 1996, p. 1079).

Co-production can occur at one or multiple points during the process of creating and providing public services (including during the design, planning, implementation, and review stages). Of relevance to this paper's case study are instances of co-production during the planning, delivery, and assessment phases of the agricultural extension processes (co-design, co-delivery, and "co-assessment, respectively). *Co-design* refers to the public's engagement in decision-making during the planning stages of a public program. *Co-delivery* refers to systems in which the public volunteers deliver services while receiving additional support from the public sector to organize, supply, or otherwise assist volunteer initiatives. *Co-assessment* refers to involving the public in the evaluation of public services and programs, either by soliciting feedback from the public via surveys or interviews with citizens or facilitating the public in other evaluative processes such as data collection or even defining program success (Loeffler, 2021a, 2021b).

Understanding SAWBO / RAB as a *co-productive* approach to agricultural extension also reflects insights from cultural transformation theory (Eisler, 2015a), particularly the distinction of domination systems (characterized by rigid, top-down, often fear-based hierarchical power structures and inequality) and partnership systems (characterized by democratic and egalitarian structures and emphasizing nonviolence, mutual respect, and inclusivity) (Eisler, 2015b). This distinction illuminates how the structures of systems shape beliefs, institutions, and relationships within societies, influencing cultural and technological development.

For organizational contexts, cultural transformation involves moving from hierarchical to collaborative practices that empower more egalitarian practices and contexts (Lutomia et al., 2020). Senge (2006) adds that shared visions emerge from personal

visions and can thus nudge organizations to encourage members to build personal and shared visions.

According to Senge (2006), personal mastery is the foundation of a shared vision. Thus, organizations should support this by fostering proactive engagement and collective goal-setting (Eisler, 2015b; Senge, 2006). Relatedly, the practical implementation of partnership principles requires developing a shared vision and fostering open communication, which can enhance organizational effectiveness and create more inclusive environments (Eisler, 2015b; Senge, 2006).

For international development, cultural transformation theory can guide the transformation of agricultural extension systems and digital partnerships. For instance, partnerships between SAWBO and Rwandan institutions align with cultural transformation theory by integrating global academic resources with local expertise, promoting inclusivity and contextually appropriate solutions (Lutomia et al., 2018); in particular, the preparedness of SAWBO to be responsive to new/emergent information critically enables achieving the goals of cultural transformation theory. Such an approach encourages shifting from traditional, top-down (domination systems) methods to more genuinely collaborative (horizontal) and inclusive models (partnership systems). This shift also affords perceiving *Umuganda* as an existing strength to be welcomed into the collaboration, rather than a problem that must be 'worked around' (or, worse, eliminated).

Co-productive Partnerships and Information Communication Technologies

A 2020 systematic review by Clifton et al. (2020) of co-production processes using ICTs to provide public services revealed several key factors influencing project success. On the government side, enablers of successful co-productive partnerships included affordability, a capable or trained workforce able to implement the program, support and regulation, and the belief among government agents that ICTs would improve service delivery (Clifton et al., 2020). Factors that negatively impact ICT-enabled co-productive projects include poor project execution, failure to plan for how the service

will be used by end-users, complex and changing regulatory environments, and the overall lack of support by government personnel (Clifton et al., 2020). Other factors also noted as important for the success of ICT-enabled co-productive partnerships include the early inclusion of citizens in the program implementation process; using only the most common ICT forms; trust in the government, developers, and providers of the ICT services; self- and response efficacy; embeddedness and relationships with other co-production partners, and the potential for future social interactions between citizen groups (Clifton et al., 2020; Van Eijk & Steen, 2016).

THE SAWBO / RAB PARTNERSHIP PRAXIS USING DESCRIPTIVE ANALYSIS

The goal of this paper is to envision the future of partnerships. As such, while we briefly summarize the key past and ongoing activities by RAB / SAWBO, any details we focus on are not meant merely to describe events or outcomes but to illustrate the partnership's potential for the future.

SAWBO / RAB comprises a *public-good, e-extension approach to agricultural extension in Rwanda*. It uses carefully curated, scientifically grounded animated educational content on locally relevant topics to enhance farmers' knowledge and practices, contributing to national agricultural productivity and food security. The partnership effectively bridges the gap between scientific knowledge and practical application in rural communities by lowering the transactional costs. Translating the videos into the most comfortably locally spoken form is an indispensable part of this process (Bello-Bravo, Medendorp, Lutomia, & Pittendrigh, 2023b). Identifying — through researching, learning, and adapting — locally effective channels for video dissemination is also critical, whether via television, radio call-in shows, smartphones, workshops, or 'pop-up' demonstrations at train crossings. Building in adaptive learning organizationally is essential if non-local partners (SAWBO) will best benefit from local partners' (RAB) knowledge.

Moreover, SAWBO / RAB collaboration is cross-sectoral and works to address wicked problems (Bello-Bravo et al., 2023c). Wicked problems are complex, often seemingly intractable, situations that resist the strict definition needed to synthesize technical solutions (Rittel & Webber, 1973); aggravatingly, they tend to chronically recur even after being ostensibly solved. Often, these are sociocultural problems (like poverty and gender inequality, and their attendant educational, digital, socioeconomic 'gaps'). As such, simply to *address* them requires interdisciplinary partnership(s) and cross-sector collaboration (Gray & Wood,1991). When supported by technology, these cross-sectoral collaborations can bridge gaps to allow at least temporarily effective knowledge and mitigation of such complex problems (Gilbertson, 2020). For example, as new invasive pests, changes to weather patterns, and migration and displacement continue to manifest chronically as ecological and socioeconomic consequences of climate change, being prepared to adapt to these evolving conditions is essential.

Timeline of Practical and Adaptive Strategies

Table 1 summarizes significant steps or milestones during RAB / SAWBO (Mugabo et al., 2023).

Table 1. *Milestones During the SAWBO / RAB Partnership*

Partner Organization	Partnership Activities	Status
RAB	Coordinating the inclusion of various agricultural organizations in Rwanda to participate and buy into the collaboration.	Ongoing
SAWBO / RAB	Co-developing video animations for Rwandan farmers and agricultural practitioners.	Ongoing
SAWBO / RAB	Hosted workshops to enhance science communication for journalists and stakeholders, using SAWBO videos to simplify complex concepts.	Completed

Partner Organization	Partnership Activities	Status
RAB	Translated 17 SAWBO animations into Kinyarwanda to ensure accessibility for the primary language spoken throughout Rwanda. Open opportunity to move more SAWBO videos into Kinyarwanda in the future.	17 Completed, Future opportunities for more videos ongoing
SAWBO / RAB	Launched a co-branded website/portal featuring RAB-approved content (Scientific Animations Without Borders, 2025).	Completed Open space to add more videos in the future
RAB	Organizing training sessions utilizing SAWBO animations to facilitate knowledge transfer and foster collaboration among key Rwandan stakeholders in the agricultural sector.	Ongoing
SAWBO	Conducting training sessions utilizing SAWBO animations to facilitate knowledge transfer and foster collaboration among key Rwandan stakeholders in the agricultural sector.	Ongoing
RAB	Organized with OFAB-Rwanda a workshop to enhance journalists' skills in science communication, introducing SAWBO animations to simplify agricultural concepts.	Completed
SAWBO	Participated in workshops by RAB and OFAB-Rwanda to enhance journalists' skills in science communication, introducing SAWBO animations to simplify agricultural concepts.	Completed

During workshops, activities to expand the accessibility of animated videos to farmers were undertaken, mainly using smartphones and other audio-visual-based devices. Importantly, participants identified knowledge gaps within the Rwandan agricultural sector and explored how animated videos could contribute to filling those gaps (i.e., by more exactly tailoring the development of technologies to the specific needs of farmers and other actors in the agricultural sector). That SAWBO / RAB was prepared to act on these *solicited* proposals from participants is not remarkable, but the

preparedness also includes acting on unsolicited input and changing course dramatically, if necessary.

A jointly launched website featuring 17 SAWBO videos translated into Kinyarwanda, along with two WhatsApp groups, were created to extend the reach of the agricultural information across Rwanda. Although concerns exist around WhatsApp's privacy and personal data usage policies, it was already the most popular messaging application in Africa, even prior to COVID-19 (Adavant, 2021; Ajene, 2020; Frew, 2022). As such, WhatsApp widely affords sharing experiences, learning from posted (video) content, exchanging feedback on the practical application of scientific knowledge, and engaging in discussions on agriculture, development, and social issues (Bello-Bravo & Lutomia, 2024; A Lutomia & Bello-Bravo, 2024; A Lutomia et al., 2024). It also affords socially co-productive decision-making between SAWBO members, RAB members, farmers, and members of other agricultural stakeholder groups and individual people marketing their farm produce.

However, while digital ICTs are indisputably a part of the future of partnerships, their access and use are not technologically neutral (Williams, 2014), especially with respect to gender (Gumucio et al., 2019; Huyer, 2016) and socioeconomic status (Bello-Bravo & Lutomia, 2024; A Lutomia & Bello-Bravo, 2024). To leverage these informationalizing approaches effectively requires more than simply putting the videos on blast or online. To mitigate these issues, SAWBO / RAB also provided video-loaded USB memory drives for use with laptops or smartphones as public screens.

There is nothing revolutionary in utilizing this channel; rather, the emphasis is the built-in preparedness of the collaboration to utilize a channel that is usually overlooked as an option. Given the instantaneous access of the Internet and cloud-based storage, transporting data via USB drive will seem not only obsolete but inconvenient. However, as the Rwandan context shows, such drives are not yet obsolete and may sometimes be a more feasible channel. More generally, a successful non-domination paradigm, as highlighted by Lutomia et al. (2020) will rely on any channel that supports

organizational autonomy, trust, shared problem domains, and mutually beneficial interactions. These elements foster positive collaboration outcomes and ensure that all parties involved in the dissemination process can contribute to and benefit from the shared goals of the partnership.

DESIGNING SAWBO / RAB FUTURE-BASED PARTNERSHIPS

The long-term viability of SAWBO / RAB's partnership model is strengthened by its grounding in existing Rwandan extension structures, especially the *Twigire Muhinzi* (Self-sufficient farming) model institutionalized by the Ministry of Agriculture and Animal Resources (MINAGRI) in 2014. *Twigire Muhinzi* is a decentralized, farmer-to-farmer approach that combines the efforts of locally-elected farmer-promoters with the Farmer Field School (FFS) methodology (Ministry of Agriculture and Animal Resources, 2023; Rwigema, 2023; Uwimbabazi, 2012). These efforts, in conjunction with the value of *Umuganda*, reflect co-productive local aspects that RAB / SAWBO tapped as parts of its e-extension efforts.

The point to be drawn here involves the incorporation of a culturally established and familiar practice (*Umuganda*) within a new informationalizing context that is unfamiliar. Much in the same way that translation (literally) translates a video's content into a locally comprehensible form, drawing on locally comprehensible cultural practices (without distorting, marginalizing, or ignoring them) helps "translate" novel information into locally usable practices as well (Bello-Bravo et al., 2023b). In a genuine sense, translation is ultimately more cultural than linguistic" (Ajiboye, 2016; Braçaj, 2015). Such translation is critical for the future of partnerships.

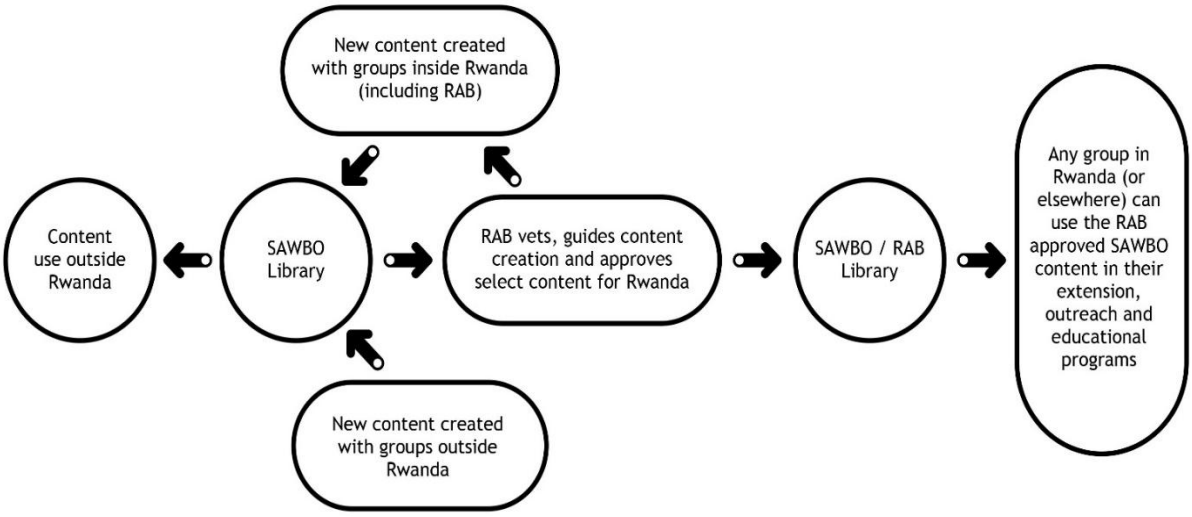
In line with this, SAWBO and RAB leverage their comparative advantage to provide a public good e-extension service to farmers in Rwanda. Together, they provide access to video animation content using mobile technologies and other gadgets as a freely available, library/encyclopedia model of agriculture extension service. As access to devices and the Internet changes over time, local actors can browse, select, and use

this content in their systems when and where it is convenient for them. This digital access will continue to evolve, as will the ways its content is used, as local actors embrace changing technologies and local (Rwandan) and global experts collaboratively create and curate content.

Once available, the Rwandan public sector can then choose, vet, and approve content for use in the country. These materials are available for long-term use by any entity in the country for educational programs. Future collaborations with universities and research institutions can explore other research areas and development opportunities to benefit other organizations not involved in the preliminary creation. This new content, created by groups inside or outside of Rwanda, is then added to the SAWBO library and, after latter vetting, approval, and voice overlaying into Kinyarwanda or other languages, can be used by any group in Rwanda. For example, an animation for Newcastle Disease prevention in Kinyarwanda originated in a previously funded USAID program and collaborative efforts between USAID Washington, the USAID Feed the Future Innovation Lab for Genomics to Improve Poultry, and SAWBO.

Figure 1 provides a schematic illustration of the SAWBO / RAB partnership that takes into consideration both global and Rwandan production of SAWBO content, coupled with Rwandan use of the content post-RAB approval. It summarizes the cyclical and collaborative nature of the SAWBO / RAB partnership model, illustrating how content flows between global and local contexts through a dynamic feedback process. This includes the dual origins of content, both within and outside Rwanda, and the central role of RAB in vetting, adapting, and approving that content for national use. This vetting process ensures the cultural and practical relevance of materials before they are added to the joint SAWBO / RAB library. Once vetted, content becomes publicly available to anyone for use in Rwanda's extension and outreach programs. Importantly, the figure emphasizes not only the partnership's cross-institutional exchange but also its structural commitment to preparedness, distributed responsibility, and localized adaptation, all of which are core features of the paper's argument for future-oriented, non-dominator collaboration.

Figure 1. *Future SAWBO / RAB Partnership via Virtual Space*



Future collaborations would do well to intentionally institutionalize project activities by integrating them into government policies within relevant ministries to promote lasting systemic change. According to Keman (2017), institutionalization is a process aimed at regulating societal behaviors within organizations or entire societies. It typically involves three key actions: (1) establishing rules, (2) adapting or developing best practices, and (3) replacing outdated rules with new ones. Institutionalizing project processes and outcomes into government systems entails embedding the results and best practices into government organizations' formal structures and policies, ensuring long-term sustainability. This process often requires aligning project goals with national strategies, securing policy support, building local capacity, and facilitating government agencies' adoption of tools, frameworks, or solutions.

Through institutionalization, the benefits of a project can extend beyond its initial funding or timeline and be maintained by relevant government institutions for continued impact. Rwanda exemplifies a country where project processes and outcomes are effectively absorbed into the government system, largely due to strong

government buy-in (Neza et al., 2021). This success is supported by pre-existing policies addressing relevant challenges and aligning partner services and products with these solutions. The trust and mutual agreement between RAB and SAWBO, built through this partnership and past relationship with the two SAWBO team members, further facilitated this institutionalization process.

Limitations of the Model

While this paper offers a descriptive and future-oriented analysis of the SAWBO / RAB partnership, certain limitations of the model warrant acknowledgment. First, as with all qualitative research, it is delimited by the time and place of its exploration such that more research would be necessary to gauge its generalizability.

Differences in inter-organizational timelines are a typical part of these types of collaborations. RAB operated on longer timelines than SAWBO, as institutional processes that required multi-level approval to ensure content aligned with national visions. However, SAWBO is completely adaptable to (and used to) such differential timelines, as they were well aware that RAB personnel were contributing to the partnership in addition to their regular responsibilities. This underscored the need for flexible timelines.

Additionally, the extensive reach of the partnership presented both opportunities and challenges. While the SAWBO-RAB library began to address problems relating to Rwandans' fragmented access to information, identifying appropriate local experts required a broader network approach inclusive of both RAB staff and other local, regional, or international actors (e.g., CGIAR center scientists and NGO staff). Both organizations were flexible in engaging this broader network. Monitoring and evaluation efforts on content use studies did not occur as they were beyond the scope of the initial component of this collaboration. From RAB's perspective, the primary challenge was the lack of dedicated personnel and infrastructure to support the partnership within their existing institutional framework, further reinforcing the need for sustainable investment in collaborative initiatives.

The intent of the described collaboration was to make available to anyone in Rwanda, through the RAB / SAWBO collaboration, existing (and co-created within the context of the grant) SAWBO content that is RAB approved. Thus, anyone in the country can use such content knowing that it has been approved by RAB. However, future content creation and adaptations are not guaranteed, as they would require future funding; however, existing content can be used by groups within Rwanda for the long-term. Thus, the completed step is that the current content can be used indefinitely into the future. Additionally, beyond the scope of this model, evaluation of user behavioral change, food security improvements, or systemic institutional transformation are broader research questions. Finally, although the partnership aims to avoid domination dynamics, the transnational nature of the collaboration can introduce seen and unseen power differentials that must be vigilantly monitored and continually renegotiated. These limitations do not undermine the value of the model but rather reinforce the importance of ongoing responsiveness and contextually grounded adjustment as essential features of partnership-based futures.

CONCLUSION

The SAWBO / RAB collaboration exemplifies how digital tools and platforms can enhance future-oriented, co-productive, culturally transformative partnerships while facilitating equitable stakeholder engagement and addressing logistical challenges for service provision. This partnership, marked by animated videos for agricultural e-extension, models how to improve the reach, consistency, and capacity of agricultural extension services in the future. In Rwanda, we see the empowerment of farmers and stakeholders to co-deliver services through collaborating in the values of *Twigire Muhinzi* and the spirit of *Umuganda*. While the overall impact on Rwandan agriculture remains to be fully realized, the RAB / SAWBO partnership highlights the transformative and co-productive potential of integrating digital content into agricultural practices and preparedness to incorporate new/emergent information organizationally into the partnership's practices. This serves as a model for forming inclusive, sustainable partnerships across sectors. Expanding technology access, localizing content,

institutionalizing new agricultural practices, incorporating (not distorting) cultural practices, and collaborating in virtual spaces ensure that partnerships will be effective for advancing global efforts to solve tractable and intractable problems.

In sum, by integrating digital tools and fostering partnerships across sectors, a broader transformation in how agricultural extension services are delivered and how successful partnerships are formed in the agricultural space can occur. In particular, using virtual spaces to enable longer-term interactions between RAB and SAWBO affords creating, adapting, and making more new content available, particularly when end-users initiate requests for it. Being prepared and able to meet those requests is essential.

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