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Drivers of Scale and Sustainability of Food Safety Interventions in Informal Markets: Lessons from the Tanzanian Dairy Sector

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Abstract: Food safety is critical but poorly addressed in African countries. A food safety training and certification intervention piloted in Kenya, India, Tanzania, and Nigeria was scaled and sustained in India but not the African countries. There is limited knowledge about how contextual factors facilitated or limited the scale and sustainability of the intervention in African countries. This research analysed the reach and contextual drivers of scale and sustainability of the intervention in Tanzania's informal dairy sector four years post-implementation to draw lessons around the scale and sustainability of such interventions in African contexts. We utilized a convergence mixed method study design. We compiled data using document review, surveys with dairy traders, and key informant interviews with key dairy stakeholders. The intervention reach was limited. Critical incentives for traders and intervention implementers to engage with the intervention were lacking due to the absence of government commitment to support the intervention through policy. The traders and intervention implementers also lacked adequate capacities, compromising intervention delivery. For the intervention to achieve scale and sustainability in Tanzania and similar contexts, governments must be committed to food safety and provide enabling policy environments. The interventions must also consider the capacities of the beneficiaries and implementers.

Keywords: capacity building; contextual factors; food safety; incentives; informal sector

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1. Introduction

Informal food markets dominate food trade in low- and middle-income countries (LMICs), yet food safety policy is either unsympathetic towards these markets or ignores their existence [1–5]. This is despite the fact that informality is primarily driven by the absence of capacity and incentives among small informal actors to comply with Codex-based standards and regulations for food safety [6–9]. The result is often a lack of food safety regulations, standards, or policies to govern food safety in the informal markets, prompting public health concerns [9–11]. For example, foodborne illnesses pose a significant burden on public health in LMICs. Indeed, LMICs bore the highest burden of foodborne illnesses globally in 2010, as reported in recent estimates by the World Health Organization (WHO) [12].

This is mainly because informal markets, which are dominant in these countries, lack food safety technical capacity, adequate infrastructure, and basic sanitation, resulting in poor food-handling practices among value chain actors [7,9,12,13]. In response to such concerns and the fact that traditional regulatory approaches failed to yield improvements in food safety in informal markets, innovative and incentive-driven training and certification (T and C) interventions were piloted and implemented in Kenya, India, Nigeria, and Tanzania between 2002 and 2015. The intervention was designed to address, through training, the knowledge gap and sub-optimal practices in food handling and testing for quality among informal traders to ultimately improve milk safety in Kenya, India, and

Tanzania, as well as meat safety in Nigeria. The intervention also sought to legitimize informal businesses, which, after the training, were issued with certificates by the regulatory agencies [14]. In light of urban contexts' longer nature and greater consumer reach, the intervention was piloted and implemented in urban and peri-urban settings.

The T-and-C intervention displayed different degrees of success in different contexts. Previous studies on the short- and medium-term effects of the T-and-C intervention in Nigeria's meat sector, Kenya's and India's dairy sectors indicated a change in practices, improved meat, and milk quality, as well as enhanced economic gains [14–19].

Furthermore, the intervention was scaled out to 16 more districts beyond the pilot district in Assam, India, and the intervention activities have been sustained with efforts to incorporate the whole informal dairy development initiative under the act of the Food Safety & Standard Authority (FSSA) of the Government of India [18]. However, scale and sustainability have not been achieved with the intervention in Kenya, Tanzania, and Nigeria. The informal sector is still considered illegal in Kenya and Nigeria, with a strong push for formalization by the governments. At the same time, it is treated with benign tolerance in Tanzania. There is a dearth of evidence on how and why these interventions did not achieve scale and sustainability in the African context [20–24].

Similar to existing research on the T-and-C intervention, the focus has been on assessing the impact of training interventions on the knowledge, attitudes, and practices of training recipients. For example, a study of a food safety intervention among college students reported short-term success of food safety training interventions in improving the knowledge, attitudes, and practices of target beneficiaries [25]. Furthermore, a review of 25 food safety interventions evaluated in Asia indicated a focus on changes in knowledge, attitudes, and practices of intervention beneficiaries conducted using before-and-after studies (60%) and randomized controlled trials (40%) where 24 of the 25 interventions showed some degree of success [26]. The scholars identified a gap in determining intervention efficacy and cost-effectiveness and recommended research on factors of food safety intervention effectiveness and sustainability.

Several contextual factors influence intervention to scale and sustainability, including characteristics of the geographic location, socio-economic characteristics of the intervention implementers and recipients, their beliefs and cultural practices, regulations and broader policies that govern the intervention, political and historical factors that influence the acceptability of the intervention and the extent and how the target population engages with the intervention [27–29]. While it is critical to consider the context in which an intervention is to be applied during intervention design, identifying prospectively all-important contextual factors is likely to be difficult. Key contextual variables relevant to intervention implementation are often identified in the theory of change underlying assumptions [30,31]. This study, thus, investigated the extent of realization of the theory of change assumptions of the T-and-C intervention as enablers or constraints to achieving scale and sustainability in Tanzania. It sought to determine how and why the intervention did not reach its expected success in Tanzania to gain insights that will guide future efforts to design and implement similar T-and-C schemes in this and similar contexts.

To contextualize the lack of achievement of scale and sustainability of the T-and-C intervention in Tanzania, it analyzed the extent of intervention reach among the informal traders who were the intervention target audience.

2. Analytical Framework

We followed a previously published training and certification theory of change (ToC) (Figure 1) [14] as a framework to explore the extent of reach and the extent to which the T-and-C theory of changes assumptions was true against what was actually observed. Based on [32], which describes the criteria used to analyze results and assumptions of a ToC, we defined the criteria for analysis of the T-and-C extent of reach and extent to which the intervention underlying assumptions were true against what was observed (Table 1). The intervention underlying assumptions detailed contextual factors that influenced in-

tervention success. They included the capacity, interests and motivation among target beneficiaries, intervention implementation on agents, partners, and policy makers.

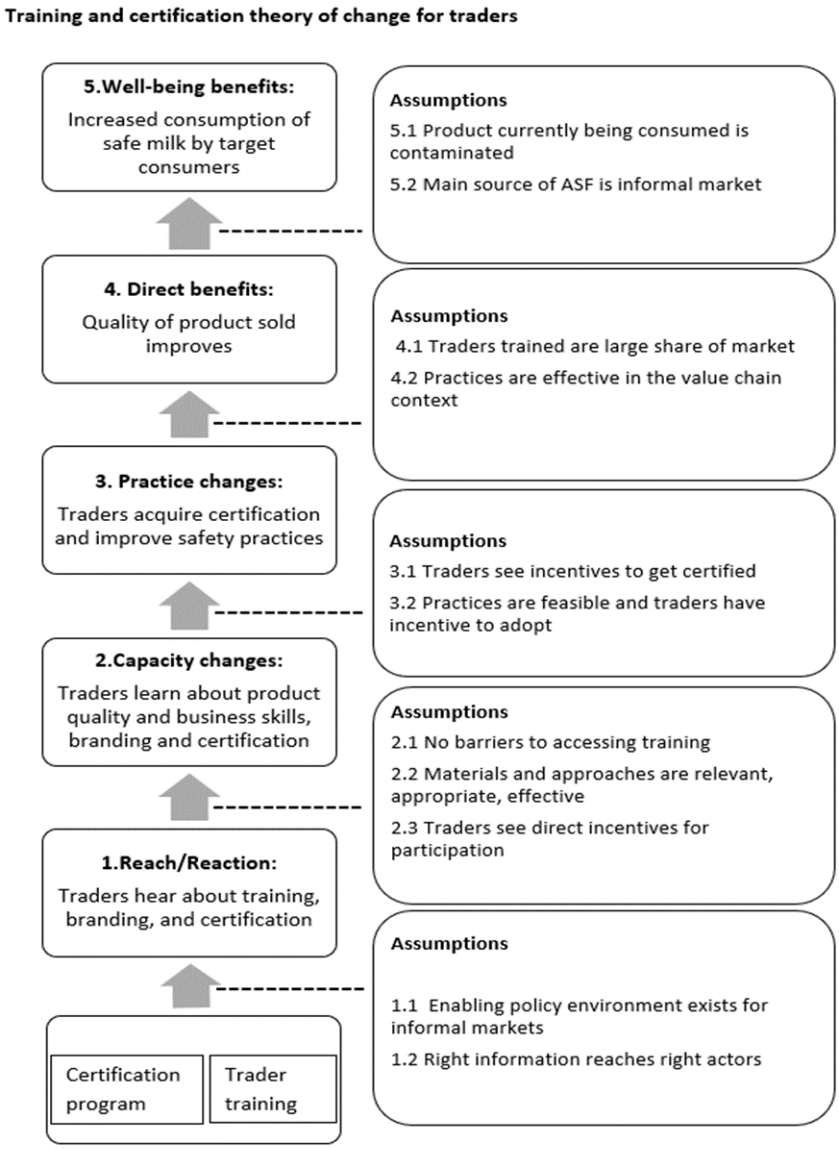

Figure 1. T-and-C intervention theory of change (modified from [14]).

Table 1. Step-by-step level results chain and evaluation criteria for a behaviour change theory of change (modified from [14]).

The Generic ToC Assessment Steps	Outcome and Underlying Assumption Elements Assessed in T-and-C Theory of Change
Getting to reach: will the inputs delivered to reach the intended target group with the right reaction?	**Outcome: Traders hear about training and certification** We assessed whether the scheme reached the target group and the extent of realization of the following two ToC assumptions that supported the outcome: ***Assumption: An enabling policy environment exists for informal markets*** Under this assumption, we assessed (1) the position of current national policy on informal milk trade and (2) the nature of the relationship between food safety regulatory agencies and informal milk traders. ***Assumption: Right information reachesthe right actors*** We assessed whether TDB carried out a sensitization campaign to inform the informal sector traders about the existence of the intervention as foreseen in the intervention design and alternative approaches used by BDS providers to recruit traders for participation in the scheme.

Table 1. *Cont.*

The Generic ToC Assessment Steps	Outcome and Underlying Assumption Elements Assessed in T-and-C Theory of Change
Getting from reach to capacity change: Will the input deliver the reach result in the intended capacity change?	**Outcome: Traders learn about product quality, business skills, and certification** We did not assess this outcome but assessed the extent of realization for the three assumptions supporting this outcome, as detailed below. ***Assumption: No barriers to accessing training.*** We assessed two aspects: (1) What could have been the limiting factors for participants to get involved: distance, timings, travel costs, and revenue loss? (2) Were there any participation criteria, such as the location of training and training costs set by the training facilitators that limited the traders' attendance? ***Assumption: Materials and approaches are relevant, appropriate, and effective.*** We assessed (1) Does the training content cover important aspects for the traders? (2) Was the training delivered adequately, i.e., by trained individuals with adequate academic qualifications and the most optimal method? ***Assumption:Traders see direct incentives for participation.*** We assessed: What were the direct benefits for the traders who participated in the training compared to those who were not trained (more profitability, less harassment, larger customer base).
Getting from capacity change to behavior change: Will the capacity change lead to the intended behavior changes?	**Outcome: Traders acquire certification and improve safety practices** We did not assess this outcome, but we assessed the extent of realization for the two assumptions detailed below. ***Assumption: Traders see incentives to get certified*** We assessed the following: (1) Does the intervention design have clear incentives for the traders to participate in the training? (2) What are these incentives? (3) How explicit are they? (4) How important are they for the traders? (5) How can they outweigh the potential challenges vendors may face to participate? ***Assumption: Practices are feasible, and traders see the incentive to adopt*** We assessed: Are the added costs to adopt the new practices reasonable for the profit margins that the traders make?
Getting from behavior change to direct benefits: Will the behavior change lead to the intended direct benefits?	**Outcome: Quality of the product sold improves** We did not assess this outcome, but we evaluated the extent of realization for the two assumptions detailed below: ***Assumption: Traders trained are a large share of the market*** Did we assess the proportion of the study participants participating in the training and certification? ***Assumption: Practices are effective in the value chain context*** We assessed: (1) What positive impacts were realized from the training? (2) What impact was expected but not achieved? (3) Was improvement in milk quality achieved among trained traders?
Getting from direct benefits to well-being changes: Do benefits lead to the intended well-being benefits? Adopted from: (Mayne, 2017)	**Outcome: Increased consumption of safe milk by target consumers** We did not assess this outcome or the realization of the two assumptions detailed below: ***Assumption:Product currently being consumed is contaminated*** ***Assumption:The main source of ASF is the informal market***

Bold denotes intervention outcomes. Bold italic denotes intervention assumptions.

3. Materials and Methods

3.1. Case Selection

We selected Tanzania for this study for two reasons. First, we purposed to study influence of contextual factors on achievement of scale and sustainability in the dairy sector in an African country. Second, we sought an African country with a higher prevalence of the informal dairy sector. Tanzania fulfilled the two criteria, having had the T-and-C intervention implemented in its dairy sector and a 95% prevalence of informality in the dairy sector compared to Kenya's 80% prevalence of informality in the dairy sector.

In Tanzania, the T-and-C intervention was initially piloted by the Tanzania Dairy Board (TDB) in collaboration with International Livestock Research Institute (ILRI) in Mwanza and Arusha in 2010, where between 75–100 traders were trained by 20 business development service (BDS) providers. There was further training between 2013 and 2015 in 30 villages and four districts in Morogoro and Tanga, where an additional 15 BDS providers,

14 government inspectors, and 69 traders were trained. One of the BDS providers who participated in the 2010 pilot in Arusha continued to offer the training independently up to 2017. By the T-and-C intervention, we will refer to the 2010 programs and subsequent training and certification activities related to this program in Arusha.

The BDS providers were inducted on how to conduct the training, accredited by the TDB, and allowed to offer training services at a fee. Public promotion campaigns facilitated by the TDB followed the accreditation of the BDS providers to stimulate end-user demand for their services. The BDS providers issued certificates of competence in milk handling to trained traders in collaboration with the TDB. Informal traders could use the certificates to apply for a trade license. The training covered hygienic milk production, handling, and simple milk-quality tests. TDB conducted frequent inspections among accredited BDS providers and trained traders to assess compliance with recommended practices. Traders who demonstrated exceptional performance would be branded with a seal of quality by the regulator.

A more detailed description of the intervention and the rollout in Tanzania can be found in Johnson et al. (2015), as well as Cherono, Kurwijila, and Omore (2012) [14,33].

3.2. Research Design

We adopted a convergence mixed-method study design (Figure 2) to explain how and why contextual factors specified in the T-and-C underlying assumptions enabled or constrained the achievement of scale and sustainability of the T-and-C intervention in Tanzania. The convergence-mixed method design adopts a pragmatic philosophy, and therefore we utilized abductive reasoning going back and forth between deductive and inductive reasoning to interpret observations. Pragmatism also embraces subjectivity and previous human experiences guided interpretations of our observations.

Mixed methods are particularly important in decoding the complex nature of individual actions and macro-level (political, social, cultural and economic climate, organizational and institutional factors, policy environment) contextual variables on intervention outcomes due to the richness of data achieved through triangulation of qualitative and quantitative data [34–37].

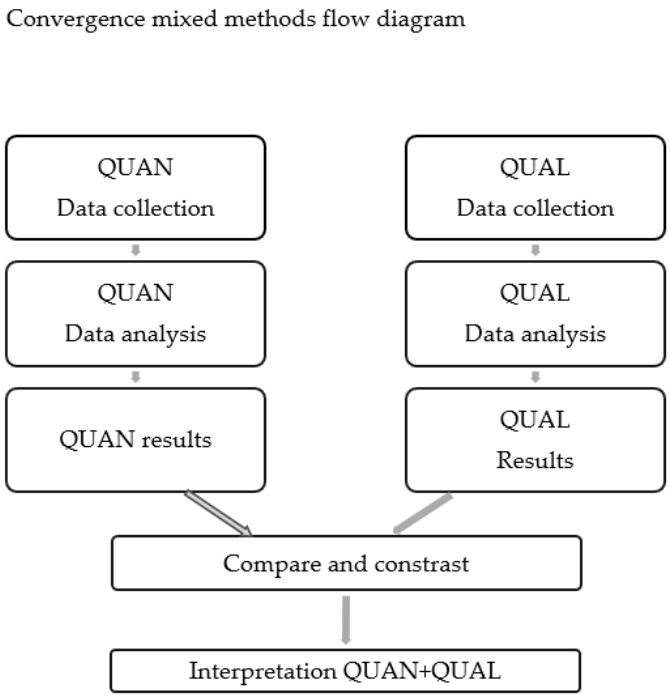

Figure 2. Convergence-mixed method flow diagram (modified from [38]).

3.3. Setting, Sampling, and Data Collection

We collected data over 3 months between November 2019 and January 2020. We conducted 189 surveys among 24 middlemen, 83 vendors, and 82 consumers in the informal dairy sector. In this study, "traders" refers to vendors and middlemen. The surveys were conducted in the urban and peri-urban districts of Arusha urban, Arusha rural, Meru, and Monduli in Arusha (Figure 3). Arusha was selected because it had the broadest reach of the T-and-C intervention activities in Tanzania.

Figure 3. Map of survey sites in Arusha (source [39]).

Key informant interviews were conducted among three small dairy processors, two development donors, five dairy regulators, two dairy sector associations, and two BDS providers (i.e., agriculture input suppliers) in Arusha, Dar es Salaam, and Dodoma, where the key informants were located. The survey and key informant interviews relied on a semi-structured questionnaire customized for the different categories of research participants. Interview topics included the extent of intervention reach and experiences with implementing the T-and-C intervention. An explanation of the purpose of the research, the potential risks and benefits of participation, and the signing of the informed consent form was conducted at the time of the interview.

The research design process sought an exploratory approach to include all categories of informal sector traders, consumers, and key stakeholders in the implementation of the T-and-C intervention. The inclusion criteria for traders and consumers were involvement in milk trading in the informal sector as middlemen, buying milk from producers and selling it to retailers, or being a retailer selling milk to consumers, or being consumers of milk sold in informal markets. The inclusion criteria for key informants were knowledge of or participation in the T-and-C intervention as key implementation stakeholders.

Survey participants were identified through facilitation by local livestock officers and snowballing sampling. Purposeful sampling was applied for key informants identified through engagement with literature and consultation with key dairy sector experts. We also reviewed all relevant policy and government documents to determine the government's

position on raw milk trade and milk safety strategies in the informal dairy sector. The documents were selected based on available literature on Tanzania's dairy sector policy and recommendations from dairy sector experts.

3.4. Data Analysis

Qualitative data from the interviews and documents review were analyzed using organizational and substantive coding. First, we reviewed the transcripts to identify key themes and concepts. Next, we used organizational coding to identify recurring themes and concepts. Substantive coding was the final stage of analysis where sub-themes were developed based on the key concepts and issues identified by participants. To situate the analysis in the participants' own narratives, we utilized verbatim quotes from participants where possible. Pseudonyms were used in reporting the research findings to protect the identity of respondents.

Quantitative data from the survey's closed questions were analyzed in STATA to generate basic descriptive statistics to determine the intervention's reach among informal dairy traders and their experiences in implementing the intervention.

4. Results

4.1. Reach Outcome: Intervention Reaches Traders, and Training and Certification Is Conducted

The study showed that this outcome was not achieved as expected. Intervention reach was limited among traders who participated in the study. Among our respondents, 15% and 17% vendors (i.e., retailers) and middlemen, respectively, had participated in the training and certification (see Table 2). Mobile vendors had a higher training attendance rate (45%) than milk bar vendors, restaurant vendors, shops, and all types of middlemen. The study showed that middle-size traders/middlemen were more likely to attend the training than smaller ones.

Table 2. Participation in training by vendor and intermediaries' type.

Type of Dairy Trader	No. of Responses	Respondents Attending Training %
Milk bar (n = 10)	10	0
Mobile seller (n = 22)	20	45
Shop (n = 43)	42	5
Other (restaurant) (n = 8)	7	14
Total vendors (n = 83)	79	15
Medium-size middlemen (larger vehicles,) (n = 6)	5	40
Very small-scale middlemen(motorbike) (n = 8)	8	13
Very small-scale middlemen(walking) (n = 9)	9	11
Unknown (n = 1)	1	0
Total middlemen (n = 24)	23	17

The poor intervention reach could be explained by the lack of realization of assumptions 1.1 and 1.2, which were anticipated to support reaching the targeted traders and implementing the training and certification, as shown below.

Assumption 1.1 : *An enabling policy environment exists for the informal sector*

Results indicated a lack of an enabling policy environment for the informal dairy sector in Tanzania. Although the informal sector is government-approved, there are no deliberate efforts by the government to support it. In Tanzania, the Dairy Industry Regulations, 2007 Part II (Sections 4 and 5) [40] and Business Activities Registration Act, 2005; second schedule (Section 3) [41] allows for trade in raw milk. Traders are required to register with TDB and acquire the local government business permit and medical certificate from the public health office. The Dairy Industry Regulations, 2007 Part III (10) [40] further requires pasteurization or such milk treatment before any sale. The requirement is for every trader to heat-treat milk before selling it (which could include boiling). Therefore, if the traders

heat-treat milk, are registered by TDB, and obtain the local government trade license, and medical certificate, they could sell milk legally.

Most of the vendors reported that they received no support, or were subjected to harassment from the regulators, although there were a few who reported being that they were harassed for non-compliance (Table 3). The harassment reported was mostly from the traffic police officials, particularly during milk transportation, and persistent revenue collection demands from regulatory agencies. However, some traders felt that the government rarely interacted with the informal sector and did not offer any support for their businesses as evidenced by the responses below:

Table 3. Middlemen and vendors assessment of government attitude towards the informal sector.

Middlemen			**Vendors**		
Government Attitude	**Frequency**	**%**	**Government Attitude**	**Frequency**	**%**
No harassment	5	23	No conflict	18	38
No support	5	23	No support	14	30
Do not know	4	18	No conflict if licensed	11	23
Keen on sale of milk from Aluminum containers	2	9	Public health advises on hygiene	2	4
Penalized for non-compliance	2	9	Heavy taxation	1	2
Harassment for being informal	1	5	Interacts with vets for vaccinations	1	2
Insist on production and sale of milk	1	5	Total number of responses	47	100
Takes bribe	1	5			
Training through TBS	1	5			
Total number of responses	22	100			

There are no disturbances from the government because we are at the lowest level to be followed upon [42].

I have not experienced any conflict or assistance from the government [43].

Assumption 1.2: *Right information reaches right actors*

The study also showed that the dissemination of information on training and certification to the traders by TDB was limited. While the dissemination activities were conducted during the intervention's donor-funded pilot phase, they ceased beyond the donor-funded pilot period. Two explanations emerged for the cessation of the dissemination activities. The first explanation was the poor access to the numerous and geographically scattered traders because trader associations, which were assumed would be the point of centralized access to traders for recruitment into the training and certification activities, did not exist (Table 4). As one of the vendors explained: *"There are no such associations currently; they were once there, but I do not know where they disappeared to"* [44].

Table 4. Vendors affiliation to milk traders' associations.

Are You a Member of Any Association Representing Vendors' Interests?	**Freq.**	**Percent (%)**
No	5	100
Total	5	100

The second reason mentioned was funding challenges for the dissemination activities within TDB, which was explained by two arguments. The first argument was a general lack of financial resources within TDB to fund the board activities. The dairy board could only raise 40% of their total annual budget with the central government providing 10% of the board's annual budget. The board was required to raise the remaining 90% of the annual budget through collection of registration fees and penalties for non-compliance from value chain actors, disposal of assets accumulated by the board, donations, and gifts from development partners. However, inadequate staff to coordinate the registration activities significantly constrained the board's revenue generation activities. The board

had five technical staff nationally at the time of this study, and efforts to renew contracts for 72 local dairy inspectors at the local government level had been unsuccessful. With the staff shortages, the board registration and inspection activities for revenue generation were limited. Donations from development partners were also difficult to secure because development partners preferred to work with the central government rather than the TDB.

The second argument for the limited financing of the dissemination activities within TDB was the lack of support for the initiative by the board's leadership. One of the regulatory agents explained that the board's leadership changed every five years. The board's priorities often changed with the changes in leadership, and where the leadership did not prioritize milk safety, the training and certification were not allocated funding. We were informed:

> *Implementing the T-and-C intervention was challenged by a lack of support from management, which did not embrace the initiative. The lack of policy that supports the scheme has made it difficult to secure funding, especially with the frequent change in leadership* [45].

Top management support is a critical success factor for interventions which ensures resource allocation and championing for the intervention within the organization [46,47]. The absence of top management support as experienced with the T-and -C intervention results in lack of resource allocation to support continuation of intervention activities in the long-term.

4.2. Change in Traders' Capacity Outcome: Traders Learn about Product Quality, Business Skills, and Certification

We did not investigate the extent of achievement of this outcome, which was beyond the scope of this study. We assessed the extent of realization of the assumptions supporting this outcome as enablers or constraints to achieving scale and sustainability of the overall intervention. As detailed below, all three assumptions (2.1, 2.2, and 2.3) were not realized.

Assumption 2.1: *No barriers to accessing training*

The training was conducted by BDS providers who were qualified veterinarians with adequate capacity to deliver the training content adequately. However, 42% of the trained vendors indicated that they faced challenges in attending the training. The challenges included bad timing, transport costs, inconvenient location, and high cost of training. According to a BDS provider, the traders failed to attend scheduled training sessions because the sessions conflicted with their business schedules. He explained:

> *Most traders fail to attend the training for all the planned days. Some traders missed training days, which meant that they lost essential training. Others simply have no time for this training. Some vendors have shunned training, while others register but do not consistently attend* [48].

While the evidence pointed to vendors failing to attend training and a majority remaining untrained, the untrained vendors did not provide any reasons for remaining untrained and failing to attend scheduled training sessions. We also did not follow-up on this point with the untrained vendors.

Assumption 2.2: *Materials and approaches are relevant, appropriate, and effective*

The BDS providers and relevant government officers rated the training material content satisfactory in addressing relevant concerns about milk safety among the traders. There were, however, concerns about the language barrier. It emerged that the training materials were initially written in English, while most value chain actors are fluent in Kiswahili. One of the service providers observed:

> *There is a serious language barrier, which hampers the effectiveness of the intervention, despite the good intentions. The available training materials are written in English, while most of the target group are fluent in Swahili* [48].

The BDS providers provided the training in Kiswahili, but the fact that the materials were in English limited the benefit that the materials could bring to the trainees. The materials were later translated to Kiswahili and, therefore, more adequately utilized by both the BDS providers and the vendors.

The financing model hindered training delivery in Tanzania. The traders were expected to pay for training but often failed to do so because they were either unable or unwilling to pay. The lack of payment by traders made the training unprofitable for the BDS providers, compromising their ability to replace training materials, such as milk testing equipment, essential for good training delivery. Furthermore, the BDS providers reported that the training and certification did not yield adequate profits compared to their other business engagements. This disincentive compromised the delivery of the training by the BDS providers. The challenges are highlighted below:

> *There was a major problem with the mode of financing adopted for the training, limiting its business profitability. Most traders could not pay for the training, and I would only get a little profit when the number of those trained was high. However, the profitability of the training was low compared to other services provided* [48].

> *I did not make any profit for the few traders; I trained because none of the vendors paid for the training. Instead, the traders expected to be paid for attending training, as is usually the case when they participate in donor-funded activities* [49].

Explanations provided for non-payment of the training fees by traders included a lack of clarity on the payment required for the traders. The donor took up the training fee during the pilot period, and the traders expected subsequent training sessions beyond the pilot period to be facilitated. However, the traders were required to take up the training fee long term. Furthermore, the cost of training charged by the BDS providers was inconsistent, with some charging more than the recommended limit by TDB. The TDB capped the training fee at TSH 10,000 for the entire training session, but some BDS providers quoted much higher fees as highlighted below:

> *The training cost per trader included refreshments and transport costs for the vendors, valued at TSH 30,000, and the trainer's profit, valued at TSH 10,000. The total amount charged to each trader was TSH 40,000* [49].

> *The training cost charged for each trader was TSH 3000 in 2010, but the cost had risen to TSH 5000 by 2017. No other costs were involved* [48].

The different amounts charged for the training by the BDS providers may have caused the traders to lose trust in the BDS providers and, therefore, the reluctancy to pay the training fee.

Assumption 2.3: *Traders See Direct Incentives for Participation*

Traders who participated in the training and certification reported improved milk quality, a broader customer base, and acquisition of value-addition skills (Table 5). While the direct benefits were realized, they did not seem enough to incentivize other traders' uptake of the intervention. The intervention uptake was only 15% and 17% among vendors and middlemen, respectively, as discussed earlier.

Table 5. Positive impacts of training among trained traders.

Positive Impacts of Training (n = 33)	**%**
Improved handling of milk	36
Milk quality	30
Cleaner premises	12
Value-added skills	6
Customer loyalty	3
Other	12

4.3. Behaviour and Practices Change the Outcome: Traders Acquire Certification and Improve Safety Practices

We did not investigate the extent of realization of this outcome, which was beyond the scope of this study but investigated the extent of realization of the assumptions supporting the outcome as enablers or constraints to the achievement of scale and sustainability of the overall intervention. All three assumptions (3.1, 3.2, and 3.3) were not realized, as detailed below:

Assumption 3.1: *Traders see incentives to get certified*

Assumption 3.2: *Practices are feasible, and traders see the incentive to adopt*

The requirement for training and certification of traders prior to registration with TDB was designed into the intervention as an incentive for its uptake. However, during this study, the traders were not required to be trained and certified for TDB registration. Instead, traders could be registered with TDB as long as they paid the registration fees and there were no negative consequences for failure to participate in the training and certification. The traders, therefore, chose not to participate in the training and certification for which they would have to incur training costs and commit time to it.

It was expected that the TDB would also benefit from making the training and certification mandatory before registration by achieving greater control over food safety regulations in the informal sector. The TDB, however, did not gain the anticipated control in food safety regulation; only 2% of all vendors who participated in the study were registered with the TDB. On the contrary, this outcome indicates the TDB's lack of control over food safety regulation in the informal dairy sector in the country.

The second condition was the feasibility and practicability of recommended practices. Traders adopted practices that did not have additional cost implications and were beneficial in preserving milk quality and increasing the traders' economic gains. For example, a BDS provider reported better milk handling practices among trained traders, which included placing milk under shade to keep it cool. Furthermore, traders did not purchase milk from producers whose animals were on withdrawal period after treatment or animals producing colostrum.

However, practices that had cost implications and required drastic changes in the traders' existing practices were not feasible. For example, using stainless-steel/aluminum containers for milk handling was impractical due to the high cost. The recommended stainless steel/aluminum containers were also difficult to transport on bicycles, motorcycles, and public transport, which are the common means of transportation for traders. The use of lactometers for milk testing was also limited among traders who cited unaffordability.

Consumer demand for safe milk was further anticipated to drive uptake of the training and certification by traders. In the study, 91% of consumers reported milk safety as important. In comparison, 60% of the consumers indicated they would be willing to pay more for milk from a vendor displaying a certificate for training in safe milk handling. However, the milk traders were not legally required to display the certificates, and raw milk was not packaged with details of milk safety-and-quality parameters. Consumers, therefore, were challenged in determining milk safety at the point of purchase. Instead, they relied on trust relationships with their suppliers.

Branding milk enterprises that adhered to the recommended milk handling practices resulting in adequate milk safety was designed into the intervention, although it never took off in Tanzania. The branding component was intended to assist milk consumers in identifying enterprises that sold safe milk. However, half of the consumers considered labels important, while the other half did not consider labels as important. The implication is that the branding would not be a great incentive to promote practices among trained and certified traders.

4.4. Direct Benefits Outcome: Quality of Product Sold Improves

We did not investigate the extent of realization of this outcome, which was beyond the scope of this study but rather explored the extent of achievement of the assumptions supporting the outcome and achievement of scale and sustainability of the overall intervention. As explained below, both assumptions (4.1 and 4.2) were not realized.

Assumption: 4.1: *Traders trained are a large share of themarket*

This assumption was not realized as only 15% and 17% of vendors and middlemen, respectively, indicated having participated in the training.

Assumption: 4.2: *Practices are effective in the value chain context*

While trained traders and some key informants reported improved milk quality among trained traders, our study did not measure milk safety. The rate of milk spoilage was used as a proxy to determine the extent of the positive impact of the training among trained traders in improving milk quality. Most trained and untrained traders experienced 1–10% milk spoilage (Table 6), indicating no difference in milk spoilage rate between the two groups of traders.

Table 6. Weekly milk spoilage rate among trained and untrained traders.

% Proportion of Milk Getting Spoiled Each Week	% Untrained (n = 86)	% Trained (n = 16)
0	27	31
1–10	54	44
11–20	7	12.5
21–30	6	0
41–50	5	0
91–100	1	12.5

5. Discussion

The T-and-C intervention had limited reach among the target audience in Tanzania in the long term, similar to previous findings in Nigeria's meat market, where the intervention scale was limited by a lack of structural change in relevant institutions and no means to continue or refresh the training among the traders [20]. The findings in our study point out two main categories of contextual factors that seem to underpin the achievement of scale and sustainability of the T-and-C intervention in Tanzania's informal dairy sector. First, is the socio-economic dynamics of intervention implementers and recipients, which hindered continued training delivery beyond the donor-funded period. Second is the broader policy environment and lack of demand for food safety among consumers, which compromised incentives for end-users (i.e., traders) and other important stakeholders (i.e., regulators) to engage in the T-and-C intervention in the long term.

The training content was rated satisfactory, yet four years after the intervention, we found that the intervention did not achieve scale and sustainability in Tanzania's informal dairy sector. The T-and-C intervention in Tanzania, like most interventions implemented in agricultural extension in African countries, was designed and delivered in a traditional, lecture-type approach [50], which was reported as unsuitable by traders. The instructor dictated learning schedules and content, which was ineffective in fostering knowledge acquisition and retention. Time and duration were identified as major constraints for training attendance in other studies [19]. Better training outcomes could have been achieved by designing capacity-building interventions based on adult-learning theory principles, where the instructor only plays a facilitatory role and respects that learners work around other responsibilities [51–53]. Adult learning is grounded on three key foundations: andragogy (student-directed learning), self-directed learning, and transformative learning, which transforms perspectives among adult learners. Additionally, adult learning considers social perspectives and contextual influences on learning [54,55]. Additional learning

materials such as posters and radio are ideal to complement training sessions [56]. Furthermore, refresher training and long-term reinforcement are recommended to sustain practice change [57].

Beyond training schedule considerations, intervention alignment with existing institutions further contributes to the intervention's achievement of scale and sustainability [58]. The T-and-C was designed to be implemented for traders in organized groups for ease of accessing traders and better utilization of resources [14], but trader organizations were nonexistent in Tanzania. Tanzania's lack of trader associations contrasts with Assam, where trader organizations existed, and the intervention achieved scale and sustainability [59]. It is important to understand why the trader associations are inexistent in Tanzania to inform the decision to either support their establishment or pursue alternative means of engaging the traders in the intervention activities.

Content-delivery approaches further influence the achievement of scale and sustainability of capacity-building outcomes [60–62]. Training delivery in Tanzania was hindered by the failure of traders to pay training fees. Therefore, the training was unprofitable for the BDS providers and incapacitated them in replacing the training materials essential for good training delivery. The small-scale nature of traders with resource limitations may explain the reluctance or inability to pay for the training. Their participation in the training and certification did not translate into higher revenues (through more milk sales or higher prices for their milk). Nevertheless, the traders had to pay for the training, meaning the participation costs exceeded the participation benefits. Other researchers have also identified cost as a likely barrier to food safety intervention sustainability [63]. Alternative sources of financing are necessary where the cost burden is unbearable for the target audiences [21]. For example, in implementing the T-and-C in India, the government facilitated free training of traders [14].

Intervention success is also driven by incentives that influence behavior change, by encouraging desirable habits, discouraging undesirable habits, eliminating pre-existing bias, and removing barriers to change [64]. The benefits of the incentivized activities have to outweigh the costs of engagement to appeal to the target audience [14]. A major incentive designed for traders and regulators in the T-and-C was compulsory training and certification of traders for them to operate legally. This would also enhance government enforcement of food safety regulations and revenue collection in the informal markets. Yet, food safety regulation in the informal markets was not top of the agenda for the government. Consequently, the training and certification requirement among traders was never enforced. As a result, the legitimization incentive for traders was lost, and the potential for revenue generation by the government through trader registration was not realized once traders failed to see participation incentives. The buy-in by key stakeholders, including target beneficiaries and government, including enabling policies and regulations, constitute an enabling environment critical for achieving scale and sustainability of food safety interventions [50]. Therefore, for incentives to be effective, they must address all relevant stakeholders' interests and be appealing enough. Where food safety regulation is not a priority for the government, value chain actors have been incentivized to practice self-regulated food safety through societal incentives. For example, the case of T-and-C in India [59].

Consumer demand was also expected to incentivize the uptake of training to achieve behavior change and improved milk quality among traders. Such demand was lacking among Tanzania's informal dairy sector consumers, just like other in other African countries [65]. Although consumers often indicate that food safety is important to them, they lack the means of determining safe food without food safety verification systems in the informal sector. The consumers indicated a willingness to pay more for good quality, safe milk, although this may change when consumers are faced with real-life situations with competing needs for other items [66]. Through advocacy, well-informed consumers and civil society organizations can enhance consumer demand for milk safety. The private sector could be compelled to provide safe food, and government to provide regulatory

oversight and technical support in verifying food safety, which may entail using rapid test methods for food safety [8].

6. Conclusions

The T-and-C theory of change assumptions detailing critical contextual factors for intervention scale and sustainability were not realized, which negatively impacted the achievement of intervention scale and sustainability of the T-and-C intervention in Tanzania's informal dairy sector. While the intervention was incentive-based and sought to address capacity gaps through the adoption of low-cost technologies, issues already identified in food safety scholarship, lack of government commitment, and the limited resource capacity of the traders were not adequately addressed, and consequently, limited realization of the intended incentives and uptake of recommended technologies.

Success in addressing food safety in informal markets in African countries using interventions such as the training and certification approach can be achieved and sustained by addressing these two critical contextual factors.

Further research embracing multiple cases and representative sampling is needed to enhance generalizability of results to different contexts.

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Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors upon request, without undue reservation.

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References and Notes

1. Grace, D.; Makita, K.; Ethe, E.K.K.; Bonfoh, B. Safe Food, Fair Food: Participatory Risk Analysis for Improving the Safety of Informally Produced and Marketed Food in Sub Saharan Africa. *Rev. Afr. Sante Prod. Anim.* **2010**, *8*, 3–11.
2. Skinner, C. *Informal Food Retail in Africa: A Review of Evidence*; Consuming Urban Poverty Project Working Paper, 2; University of Cape Town: Rondebosch, South Africa, 2016.
3. Skinner, C.; Haysom, G. *The Informal Sector's Role in Food Security: A Missing Link in Policy Debates*; Hungry Cities Partnership: Waterloo, ON, Canada, 2016.
4. Stockwell, D. *Food Safety Risk Management; Evidence Informed Policies and Decisions, Considering Multiple Factors*; FAO: Rome, Italy, 2017.
5. Kangethe, E.K.; Mutua, F.; Roesel, K.; Ntawubizi, M.; Kankya, C.; Niragira, S. *A Review of the Food Safety Architecture in the East African Community Animal-Source Foods, Fruits and Vegetables*; ILRI Discussion Paper; International Livestock Research Institute (ILRI): Nairobi, Kenya, 2021.
6. Jabbar, M.A.; Grace, D. *Regulations for Safety of Animal Source Foods in Selected Sub-Saharan African Countries: Current Status and Their Implications*; No. 610-2016-40447; International Livestock Research Institute (ILRI): Nairobi, Kenya, 2012.

7. Vipham, J.L.; Chaves, B.D.; Trinetta, V. Mind the Gaps: How Can Food Safety Gaps Be Addressed in Developing Nations? *Anim. Front.* **2018**, *8*, 16–25. [PubMed]
8. Global Food Safety Partnership. *Food Safety in Africa: Past Endeavors and Future Directions Global Food Safety Partnership*; GFSP: Washington, DC, USA, 2019.
9. Jaffee, S.; Henson, S.; Unnevehr, L.; Grace, D.; Cassou, E. *The Safe Food Imperative: Accelerating Progress in Low- and Middle-Income Countries*; World Bank Publications: Washington, DC, USA, 2018.
10. Grace, D. Food Safety in Low and Middle Income Countries. *Int. J. Environ. Res. Public Health* **2015**, *12*, 10490–10507. [CrossRef] [PubMed]
11. Roesel, K.; Grace, D. (Eds.) *Food Safety and Diet*; Routledge: London, UK, 2015.
12. Havelaar, A.H.; Kirk, M.D.; Torgerson, P.R.; Gibb, H.J.; Hald, T.; Lake, R.J.; Praet, N.; Bellinger, D.C.; de Silva, N.R.; Gargouri, N.; et al. World Health Organization Global Estimates and Regional Comparisons of the Burden of Foodborne Disease in 2010. *PLoS Med.* **2015**, *12*, e1001923. [CrossRef]
13. Headey, D.; Hirvonen, K.; Hoddinott, J. Animal Sourced Foods and Child Stunting. *Am. J. Agric. Econ.* **2018**, *100*, 1302. [CrossRef]
14. Johnson, N.; Mayne, J.; Grace, D.; Wyatt, A. *How Will Training Traders Contribute to Improved Food Safety in Informal Markets for Meat and Milk? A Theory of Change Analysis*; International Food Policy Research Institute (IFPRI): Washington, DC, USA, 2015.
15. Kaitibie, S.; Omore, A.; Rich, K.; Kristjanson, P. Kenyan Dairy Policy Change: Influence Pathways and Economic Impacts. *World Dev.* **2010**, *38*, 1494–1505. [CrossRef]
16. Kurwijila, L.R.; Omore, A.; Grace, D. *Tanzania Dairy Industry Overview 2012*; Sokoine University of Agriculture: Morogoro, Tanzania, 2012.
17. Lapar, M.L.; Deka, R.P.; Lindahl, J.F.; Grace, D. *Quality and Safety Improvements in Informal Milk Markets and Implications for Food Safety Policy*; International Livestock Research Institute (ILRI): Nairobi, Kenya, 2014.
18. Lindahl, J.; Deka, R.P.; Melin, D.; Berg, A.; Lundén, H.; Lapar, M.L.; Asse, R.; Grace, D. An Inclusive and Participatory Approach to Changing Policies and Practices for Improved Milk Safety in Assam, Northeast India. *Glob. Food Sec.* **2018**, *17*, 9–13. [CrossRef]
19. Alonso, S.; Muunda, E.; Ahlberg, S.; Blackmore, E.; Grace, D. Beyond Food Safety: Socio-Economic Effects of Training Informal Dairy Vendors in Kenya. *Glob. Food Sec.* **2018**, *18*, 86–92. [CrossRef]
20. Grace, D.; Dipeolu, M.; Alonso, S. Improving Food Safety in the Informal Sector: Nine Years Later. *Infect. Ecol. Epidemiol.* **2019**, *9*, 1579613. [CrossRef]
21. Blackmore, E.; Guarín, A.; Alonso, S.; Grace, D.; Vorley, B. *Informal Milk Markets in Kenya, Tanzania and Assam (India) an Overview of Their Status, Policy Context and Opportunities for Policy Innovation to Improve Health and Safety*; ILRI Research Report; International Livestock Research Institute (ILRI): Nairobi, Kenya, 2020.
22. Blackmore, E.; Guarin, A.; Kinyua, C.; Vorley, W.; Grace, D.; Alonso, S. The Governance of Quality and Safety in Tanzania's Informal Milk Markets. *Front. Sustain. Food Syst.* **2022**, *6*, 971961. [CrossRef]
23. Nicolini, G.; Guarin, A.; Deka, R.P.; Vorley, B.; Alonso, S.; Blackmore, E.; Grace, D. Milk Quality and Safety in the Informal Sector in Assam, India: Governance, Perceptions, and Practices. *Cogent Food Agric.* **2022**, *8*, 2137897. [CrossRef]
24. Blackmore, E.; Guarin, A.; Vorley, W.; Alonso, S.; Grace, D. Kenya's Informal Milk Markets and the Regulation–Reality Gap. *Dev. Policy Rev.* **2022**, *40*, e12581. [CrossRef]
25. Yarrow, L.; Remig, V.M.; Higgins, M.M. Food Safety Educational Intervention Positively Influences College Students' Food Safety Attitudes, Beliefs, Knowledge, and Self-Reported Practices. *J. Environ. Health* **2009**, *71*, 30–35. [PubMed]
26. Kwoba, E.; Oduori, D.O.; Lambertini, E.; Thomas, L.F.; Grace, D.; Mutua, F. Food Safety Interventions in Low- and Middle-Income Countries in Asia: A Systematic Review. *Zoonoses Public Health* **2023**, *70*, 187–200. [CrossRef] [PubMed]
27. Mitchell, R.E.; Fraser, A.M.; Bearon, L.B. Preventing Food-Borne Illness in Food Service Establishments: Broadening the Framework for Intervention and Research on Safe Food Handling Behaviors. *Int. J. Environ. Health Res.* **2007**, *17*, 9–24. [CrossRef] [PubMed]
28. Means, A.R.; Ajjampur, S.S.R.; Bailey, R.; Galactionova, K.; Gwayi-Chore, M.C.; Halliday, K.; Ibikounle, M.; Juvekar, S.; Kalua, K.; Kang, G.; et al. Evaluating the Sustainability, Scalability, and Replicability of an STH Transmission Interruption Intervention: The DeWorm3 Implementation Science Protocol. *PLoS Negl. Trop. Dis.* **2018**, *12*, e0005988. [CrossRef]
29. Kok, M.; Bulthuis, S.; Dieleman, M.; Onvlee, O.; Murphy, R.; Akweongo, P.; Namakula, J.; Banda, H.; Wyss, K.; Raven, J.; et al. Using a Theory of Change in Monitoring, Evaluating and Steering Scale-up of a District-Level Health Management Strengthening Intervention in Ghana, Malawi, and Uganda—Lessons from the PERFORM2Scale Consortium. *BMC Health Serv. Res.* **2022**, *22*, 1001. [CrossRef]
30. Craig, P.; Di Ruggiero, E.; Frohlich, K.L.; Mykhalovskiy, E.; White, M.; Campbell, R.; Cummins, S.; Edwards, N.; Hunt, K.; Kee, F.; et al. *Taking Account of Context in Population Health Intervention Research: Guidance for Producers, Users and Funders of Research*; National Institute for Health Research: Whitehall, UK, 2018. [CrossRef]
31. Mayne, J. Theory of Change Analysis: Building Robust Theories of Change. *Can. J. Progr. Eval.* **2017**, *32*, 155–173. [CrossRef]
32. Cherono, P.; Kurwijila, L.; Omore, A. *Commercialized Supply of Training and Certification in Milk Quality Assurance in Eastern Africa A Guide for Practitioners*; East Africa Dairy Development Project (EADD): Nairobi, Kenya, 2012.
33. Creamer, E.G. Enlarging the Conceptualization of Mixed Method Approaches to Grounded Theory With Intervention Research. *Am. Behav. Sci.* **2018**, *62*, 919–934. [CrossRef]

34. Krupnik, S.; Turek, K. Using Pragmatic Grounded Theory in the Evaluation of Public Policies. *Zarządzanie Publiczne* **2014**, *28*, 32–48. [CrossRef]
35. Guetterman, T.C.; Babchuk, W.A.; Howell Smith, M.C.; Stevens, J. Contemporary Approaches to Mixed Methods–Grounded Theory Research: A Field-Based Analysis. *J. Mix. Methods Res.* **2019**, *13*, 179–195. [CrossRef]
36. Holton, J.A.; Walsh, I. *Classic Grounded Theory: Applications with Qualitative and Quantitative Data*; SAGE Publications, Inc.: New York, NY, USA, 2020. [CrossRef]
37. Creswell, J.W. Steps in Conducting a Scholarly Mixed Methods Study. DBER Speaker Series 48; 2013. Available online: https://digitalcommons.unl.edu/dberspeakers/48 (accessed on 29 June 2023).
38. Mayne, J.; Johnson, N. Using Theories of Change in the CGIAR Research Program on Agriculture for Nutrition and Health. *Can. J. Progr. Eval.* **2015**, *30*, 407–428. [CrossRef]
39. Google Earth v9.190.0.0. (30 September 2021). Arusha, Tanzania. 3°09′31″ S, 35°24′32″ E, Eye Alt 2598 m. Available online: http://www.earthgoogle.com (accessed on 26 June 2023).
40. The Government of Tanzania. *The Dairy Industry (Registration of Dairy Industry Stakeholders) Regulations*; 2007. Available online: https://trade.tanzania.go.tz/media/DAIRY_INDUSTRY__REGISTRATION__Regulation__-converted.pdf (accessed on 5 September 2021).
41. The Government of Tanzania. *Business Activities Registration Act*; 2005. Available online: https://www.mit.go.tz/uploads/documents/en-1618828009-BUSINESS%20ACTIVITIES%20AND%20REGISTRATION%20ACT.pdf (accessed on 7 September 2021).
42. Jake, A. Interview with Author 2019.
43. Donna, O. Interview with Author 2019.
44. Matthews, R. Interview with Author 2019.
45. Tobby, W. Interview with Author 2019.
46. Safe, A.T.; Food, N. *Food Safety Education, Training, and Technology Interventions in Africa and Asia: A Review of Studies Relevant to Traditional Markets in Low Resource Settings*; GAIN: Washington, DC, USA, 2021.
47. Collins, J. Education Techniques for Lifelong Learning: Principles of Adult Learning. *Radiographics* **2004**, *24*, 1483–1489. [CrossRef] [PubMed]
48. Dan, K. Interview with Author 2019.
49. Heather, S. Interview with Author 2019.
50. Arogundade, R.A. Adult Learning Principles for Effective Teaching in Radiology Programmes: A Review of the Literature. *West Afr. J. Med.* **2011**, *30*, 3–10.
51. Reed, S.; Shell, R.; Kassis, K.; Tartaglia, K.; Wallihan, R.; Smith, K.; Hurtubise, L.; Martin, B.; Ledford, C.; Bradbury, S.; et al. Applying Adult Learning Practices in Medical Education. *Curr. Probl. Pediatr. Adolesc. Health Care* **2014**, *44*, 170–181. [CrossRef] [PubMed]
52. Gunduz, M.; Almuajebh, M. Critical Success Factors for Sustainable Construction Project Management. *Sustainability* **2020**, 12.
53. Uluocak, B. Critical Success Factors (CSFs) Affecting Project Performance in Turkish IT Sector. In Proceedings of the PMI®Global Congress 2013—EMEA, Istanbul, Turkey, 17 April 2013; Project Management Institute: Newtown Square, PA, USA, 2013.
54. Merriam, S.B. Adult Learning Theory: Evolution and Future Directions. In *Contemporary Theories of Learning*; Routledge: London, UK, 2018; pp. 83–96.
55. Merriam, B.S.; Bierema, L.L. *Adult Learning: Linking Theory and Practice*; John Wiley & Sons: Hoboken, NJ, USA, 2013.
56. Rosenthal, I. *Improving Rural Services for Small-Scale Fisheries Using a Technological Platform Approach*; ID 20203070750; FAO: Rome, Italy, 2019; Volume 1180, ISBN 9789251315378.
57. Soon, J.M.; Baines, R.; Seaman, P. Meta-Analysis of Food Safety Training on Hand Hygiene Knowledge and Attitudes among Food Handlers. *J. Food Prot.* **2012**, *75*, 793–804.
58. Spicer, N.; Bhattacharya, D.; Dimka, R.; Fanta, F.; Mangham-Jefferies, L.; Schellenberg, J.; Tamire-Woldemariam, A.; Walt, G.; Wickremasinghe, D. 'Scaling-up Is a Craft Not a Science': Catalysing Scale-up of Health Innovations in Ethiopia, India and Nigeria. *Soc. Sci. Med.* **2014**, *121*, 30–38. [CrossRef]
59. Alonso, S.; Deka, R.P.; Blackmore, E.; Omore, A.; Grace, D. Formalizing the Informal: Experiences from a Training and Certification Scheme in the Dairy Sector in Assam (India) and Kenya. In Proceedings of the International Conference on Agribusiness in Emerging Economies Institute of Rural Management, Anand, India, 6–7 January 2016.
60. Goga, A.E.; Muhe, L.M. Global Challenges with Scale-up of the Integrated Management of Childhood Illness Strategy: Results of a Multi-Country Survey. *BMC Public Health* **2011**, *11*, 503–510. [CrossRef]
61. Hainsworth, G.; Engel, D.M.C.; Simon, C.; Rahimtoola, M.; Ghiron, L.J. Scale-up of Adolescent Contraceptive Services: Lessons from a 5-Country Comparative Analysis. *J. Acquir. Immune Defic. Syndr.* **2014**, *66*, S200–S208. [CrossRef]
62. Bellows, B.; Nambao, M.; Jaramillo, L.; Fanaiayan, R.; Dennis, M. *Scaling up Family Planning in Zambia-Part 1: Assessment and Feasibility of Maintaining an Innovative Program*; Population Council: Washington, DC, USA, 2016.
63. Grace, D.; Alonso, S.; Mutua, F.; Roesel, K.; Lindahl, J.F.; Amenu, K. *Food Safety Investment Expert Advice: Burkina Faso, Ethiopia, Nigeria*; International Livestock Research Institute: Nairobi, Kenya, 2018; ISBN 3070900100.
64. Gneezy, U.; Meier, S.; Rey-Biel, P. When and Why Incentives (Don't) Work to Modify Behavior. *J. Econ. Perspect.* **2011**, *25*, 191–210. [CrossRef]

65. Unnevehr, L.; Ronchi, L. *Food Safety and Developing Markets: Research Findings and Research Gaps*; IFPRI Discussion Paper 00000; International Food Policy Research Institute: Washington, DC, USA, 2015.
66. Grace, D. *Food Safety in Developing Countries: An Overview*; Hemel: Hempstead, UK, 2015.

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