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Context is key in ICT4D: A longitudinal case study of the Eswatini livestock traceability system implementation - 2012 to 2022

Tania Prinsloo
University of Pretoria, tania.prinsloo@up.ac.za

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Tania Prinsloo
University of Pretoria
Hatfield Campus, Pretoria, South Africa
Tel: +27 124205855 / +27 834157913
Email: tania.prinsloo@up.ac.za

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ABSTRACT

All Information and Communication Technology for Development (ICT4D) research has a contextual aspect. However, there is no specific theory used to describe the context. This article explores Eswatini's context with their implementation of the Swaziland Livestock Information and Traceability System (SLITS). Two frameworks are combined to emphasize the role of the project's context, specifically the cultural context, as the community is highly-contextualized. Hall's Theory of High-Context/Low-Context (HC/LC) is combined with the Context and Implementation of Complex Interventions (CICI) framework. The longitudinal case study leans toward a rich contextual analysis, with the data collected presented as six distinct themes. The main findings suggest the contextual setting of an ICT4D project leads to unique findings, with the cultural aspects of the context needing greater emphasis. Future research will include identifying similar constructs in longitudinal ICT4D projects to derive a widely-used framework applicable to more such projects.

Keywords: Context, longitudinal case study, ICT4D, Hall's Theory of Context, Complex Interventions Framework (CIF), Eswatini, Swaziland Livestock Information and Traceability System (SLITS).

INTRODUCTION

All ICT4D research has a contextual aspect. As early as the 1980s and 1990s, with the emergence of the ICT4D paradigm (Heeks, 2020), researchers reported on case studies describing the developmental context. Thirty years later, there are many ways described in the literature to address the context by authors such as Qureshi (2015), Sahay, Sein, and Urquhart (2017), Masiero (2022), Osei-Bryson, Brown, and Meso (2022), Khoir and Davison (2019), Heeks and Ospina (2019), to name but a few. Authors use different frameworks to give a specific meaning to the context, with some of the more well-known theories summarized by Heeks and Molla (2009) in a compendium. One of the obstacles to generic

theories in ICT4D contexts, as Walsham (2017) describes it, is no specific way or term to refer to it directly because of its multidisciplinary nature, vastly different topics, and project focus. In this article, the researcher posits that the theory used to describe the context of an ICT4D initiative is essential. However, the overall study duration of the project implementation also significantly influences the researcher's understanding of the context, and the value of a longer study can contribute to an overall theory or framework to summarize the context in perspective.

BACKGROUND

The context of the case study described in this article is Eswatini, formerly Swaziland. Eswatini is a small country of approximately 17 364 km² in Southern Africa, landlocked between South Africa and Mozambique. In 2018, King Mswati III, the last absolute monarch in the world, changed the country's name from Swaziland to Eswatini to commemorate his 50th birthday (Marrengane, 2021). The country battles high unemployment rates (41.8%), very high HIV-positive rates (28%), and low life expectancy (58 years). In 2016, 27.9% of the population had limited access to water, 46.5% had limited sanitation, and 35.7% had no electricity (World Bank, 2020). Its estimated poverty rate is 63% of the population. The Gini Index for Inequality is very high at 54.6%. Figure 1 illustrates the geographical map of Eswatini. The country is divided into four regions: Hhohho, Lubombo, Manzini, and Shiselweni. The capital is Mbabane. Swazi is the national language, along with English (Marwick, 2013). The Christian faith is prevalent. The country has dual land tenure. Most Swazis live on Eswatini National Land (ENL), belonging to the king, and the rest of the population owns Title Deed Land (TDL), approximately 30% of the population. In 2012, the government started implementing the Swaziland Livestock Information and Traceability System (SLITS), funded by the Food and Agricultural Organization (FAO) and the Swazi government, which enables all traceable cattle to be eligible for the export market. Cattle are central in the life of a Swazi, playing a pivotal role in their culture, rituals, and social status (Dlamini & Huang, 2020). The Swazi culture is unique in many ways, assisting in defining and examining the context of the case study in more depth. Elements that comprise the cultural aspects of the context and the overall framework include Hall's contextualization model - high context / low context (HC/LC) incorporated into the Context and

Implementation of Complex Interventions (CICI) framework, discussed in the literature review below.

Figure 1. Reference map of Eswatini. (Reliefweb, 2020)

LITERATURE REVIEW

The necessity of context

Early ICT4D theories and frameworks used, for example, the Actor-Network theory and Institutional theory lacked the context component (Walsham, 2017), and it was only addressed in the more-suitable theory for ICT4D research as described by the Sustainable Livelihoods (SL) framework. Although the SL framework is very comprehensive, it is quite a difficult framework to comprehend and apply correctly. Other ICT4D theories focusing on

context are the RABIT model for resilience, the Expanded Technology Acceptance Model and the ICT4D Value chain, as discussed by Heeks (2017). There are countless more.

A large portion of ICT4D projects fail. Reasons for the failures in the literature include the emergence of the design-reality gap (Bass & Heeks, 2011), where the local community context is either ignored, misunderstood, or deemed unimportant. As a result, multiple projects are unsustainable, failing once the initial funding stops. If the community does not take ownership of the project and if it does not fit into their everyday context, the new ICT initiative will remain unadopted. Instead, technologies should empower local communities (Marais & Vannini, 2021) and be useful in everyday life. Ignoring the research context leads to flawed research (Williams, Barclay, & Schmied, 2004). One example is the case of Brazilian families having to receive their government benefit cheques; the project only realized its goals once the project implementers understood the context better, with no change needed in terms of the technology used (Diniz, Bailey, & Sholler, 2014). Another example is where project implementers did not recognize the community context, which led to applying incorrect approaches to teaching ICTs, leading to multiple barriers and lack of adoption (Bingimlas, 2009). In Morocco, the universities successfully integrated ICTs, but only once the project implementers took the time to delve into the problems the educators experienced in their unique setting (Laabidi & Laabidi, 2016). In Africa, Marais and Vannini (2021) argue that you need to apply "community-in-context sustainability" and combine it with "project-level sustainability" to merge the different value systems of the critical role players.

Culture and context: Hall's contextualization model

Applying a Western solution to an African problem results in a solution unsuitable for its purpose (Baron, 2017). The importance of this statement lies in the fact that there are differences in cultures between countries or even regions within countries. Culture is inherently part of what defines us. Hall (1976) constructed a model to align different cultural variables with the HC/LC continuum. Rösch and Segler (1987) described HC/LC countries on a scale, with Germany being LC and Japan more towards the HC. This continuum has made many shifts over time, with the assumption now that the LC countries are more the Global North countries and the HC the Global South. Korac-Kakabadse, Kouzmin,

Korac-Kakabadse, and Savery (2001) expanded on the attributes of the context continuum, and Table 1 summarizes the attributes and adds four additional attributes to the table.

Table 1. A summary of different cultural variability constructs along the low- and high-context continuum. Sources: Korac-Kakabadse et al. (2001) and Mittal and Elias (2016).

Low context	High context
Explicit information required.	Implicit, shared information, long-term relationships.
Factual information required.	Shared patterns and meaning.
Direct, explicit, rational argumentation.	Indirect or implicit, the emotional exchange is valued.
Individualism	Collectivism
Direct	Indirect
Abstractive culture.	Associative culture.
Low-uncertainty avoidance.	High-uncertainty avoidance.
Feminine culture.	Masculine culture.
Short-term orientation.	Long-term orientation.
Looseness in culture stems.	Tightness in culture stems.

Because of the close link between context and culture, ICT4D project implementers will benefit from familiarizing themselves with the cultural aspects of the intended beneficiaries before embarking on the initiative. In Eswatini, the culture is very highly contextualized. For example, one would not say no to a superior if tasked with something. It is deemed rude not to agree with your superior, resulting in the subordinate being unable to complete the task, as he did not fully understand what was expected and yet was too afraid to ask. On the other hand, if your culture is low context, you will expect the subordinate to complete the task and get angry if it is not done. Simple misunderstandings like these can ultimately result in project failures.

The Context and Implementation of Complex Interventions (CICI) framework

Context is also so much more than culture. Pfadenhauer et al. (2017) describe the context as comprising the following domains:

1. Geographical. The project location is significant as it can explain many aspects of the context. For example, if you live in a poorer part of a wealthy country, you cannot necessarily be treated similarly to others living in more affluent areas.

2. Epidemiological. Certain parts of Africa struggle with malaria, ebola, and yellow fever. It is essential to know the health risks in other countries.

3. Socio-cultural. A deeper understanding of specific cultures is needed, as Hall (1976) already identified.

4. Socio-economic. One has to keep in mind the living conditions of the population, as well as their prospects for economic growth. Countries such as Zimbabwe and Venezuela struggle with hyperinflation (Hilmola, 2021), making investing riskier.

5. Ethical. Ethics refer to the conduct of the researcher but also to the context. For example, the beneficiaries might consider ICT the wrong development priority (Schelenz & Pawelec, 2022). Do you equip the farming community with a telecentre? Or would you instead drill a borehole so that they can water their crops?

6. Legal. In most countries, basic human rights are guaranteed. However, other countries might not allow girls to attend school, women to own a mobile phone, or young children to get vaccinated.

7. Political. In an ICT4D project, the political landscape will determine how accessible the country will be for a new project or initiative. The political context became more relevant with the war between Russia and Ukraine, as it will depend on who will be your political allies.

The CICI framework entails other aspects besides the context, as is illustrated in Figure 2 below:
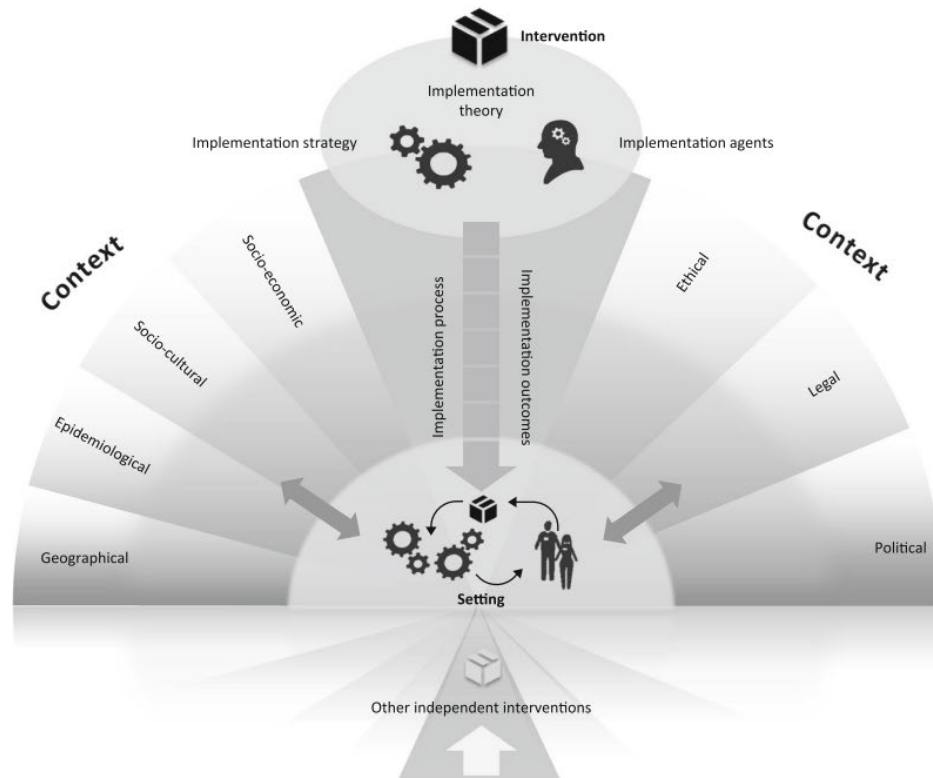
Figure 2. The CICI Framework. Adopted from Pfadenhauer et al. (2017).

In Figure 1, there are three distinct components:

1. The context. There is constant interaction between all the aspects of the context with the ICT4D intervention.

2. The implementation. Some form of implementation theory or strategy is utilized in this intervention.

3. The setting. The physical location, as well as how it interrelates with the context and the implementation.

The overarching component in the CICI framework is context. The context of a project can either be a snapshot in time or explain the project's timeline. For example, the ICT4D intervention is understood much deeper if the study was conducted over a more extended period (Ramadani, Kurnia, & Breidbach, 2018), and its value is discussed next.

RESEARCH DATA AND METHODS

Data collection

During the initial visit to Eswatini in December 2012, the researcher interviewed the main stakeholders at the government level and observed a rural Nguni cattle dipping event. Subsequent visits took place in July 2013 and August 2014, when four more interviews were conducted. In 2016, a larger number of veterinary assistants working directly with the farmers and the cattle at the dip tanks completed a pre-approved questionnaire, and the data were statistically analyzed. In 2018, the researcher returned to Eswatini to discuss a new project with government stakeholders and enquired about the overall success of SLITS. Finally, in January 2022, the researcher conducted twenty-five interviews with stakeholders in Eswatini, of which eighteen were veterinary assistants. The researcher documented field notes and observations from 2012 and all the interviews were recorded, transcribed, and coded to identify themes. The ethical clearance applications were approved before the researcher collected the data. The longitudinal case study method fitted the data very well, as the researcher built relationships and trust in the community during the past eleven years. Table 3 briefly summarizes the data sources and their uses.

Table 3. Data sources and uses. Adapted from Holeman and Barrett (2017).

Type of data	Use in the analysis
Observation of dipping events	Used in gaining a much deeper understanding of what the work and challenges of the veterinary assistants are. Experiencing large groups of cattle of 800 or more align themselves and get dipped in less than two hours. The order and structure were impressive.
Photographs	To capture unique data, for example, the process of tagging a calf. It lends to the richness of the case study.
Field notes	The researcher used the time after every day's data collection to make detailed notes

Type of data	Use in the analysis
	of the experiences. The field notes were the basis for the main themes that emerged in the case study.
Informal interviews	The veterinary assistants that took part in informal interviews in 2014 spoke more freely and the questions asked were less structured. They also seemed more at ease and even illustrated how they perform specific tasks on their computers using the SLITS program.
Formal interviews	These interviews were very structured in nature and aimed to gain a deeper understanding of the SLITS implementation, the working conditions of the veterinary assistants, and their unique context.
Project-related documents	To gain more knowledge of the Eswatini context, specifically political and economic aspects.

The Eswatini livestock traceablity systems case study

Eswatini exports beef to the European Union (EU) and Norway as a direct result of the successful implementation of SLITS, that ensures farm-to-fork traceability (Mwanga, Mbega, Yonah, & Chagunda, 2020) of all exported meat products. The project started in 2001 with the Livestock Identification Act, regulating cattle branding. From 2006, all cattle were branded with the Swazi shield on the left hind leg. In 2012, the cattle were ear-tagged with a yellow plastic tag in the left ear, containing the Swazi shield, the dip tank number, and the animal identification number, and a smaller ear tag in the right ear with the same information, in case the left ear tag was lost or damaged. The initial ear tagging was free of charge, as the project was co-sponsored by the Eswatini government and the Food and Agriculture Organization (FAO). Still, farmers had to buy their tags in the future. Tagging was done at

the different dip tanks. A specific veterinary assistant oversees the weekly dipping of cattle, ear tagging, branding in winter, checking animal health, and manually capturing all the information for record-keeping. The computerized database followed in late 2012, with all cattle registered on the new system. This process took many years, as some veterinary assistants could not access computers. From 2014, no cattle could be sold for export without the ear tag and registration on SLITS, as per international traceability requirements. Table 4 below represents a short timeline of the Eswatini case study, also including several other key dates.

Table 4. The evolution of SLITS. (Own data supplemented by Marrengane (2021)).

Year	Event
1968	Swazi Independence from the United Kingdom.
1973	King Sobhuza repealed the 1968 constitution on 12 April 1973 and dissolved parliament. He assumed all powers of government and prohibited all political activities and trade unions from operating. He is now an absolute monarch.
1986	King Mswati III becomes king.
2001	In terms of SLITS' history, it already started with the introduction of the Livestock Identification Act of 2001.
2006	From 2006, all cattle were branded with the Swazi shield.
2012	Cattle were ear-tagged with the visual ear tags. The project was funded, so all communal farmers' cattle were initially ear-tagged free of charge, but after the initial tagging, farmers now have to buy an ear tag costing roughly E15, equivalent to less than one US dollar.
2013	The computerized system – the final phase of SLITS – was introduced in 2013, but not all veterinary offices had access to computers or the government networks to access SLITS. That meant that offices with the computerized system were packed, especially on Fridays. Veterinary assistants have to

Year	Event
	be in the office on Fridays.
2014	All cattle for export have to be registered on SLITS.
Later in 2014	Cattle exports decline sharply. The problem was temporary. As more animals were registered on SLITS, the numbers increased again.
2016	The veterinary assistants complete questionnaires regarding their experiences with SLITS, yielding positive results.
2018	King Mswati III changes the country's name from Swaziland to Eswatini.
2020	COVID-19 leads to severe lockdowns and economic hardship.
2021	In June 2021, there were widespread riots and protests against the king and his lavish lifestyle.
Also in 2021	The Swazi government provided more computers, but severe shortages remain. Money became more tightly controlled, and the lack of any incentives leaves the veterinary assistants pessimistic and disheartened.
2022	The researcher experiences a decrease in the morale of the interviewees.

Data analysis

Data analysis began in 2012, when the researcher scrutinized the field notes for themes about the uniqueness of the case study. The themes were explored in-depth by supplementing them with many documents related to Eswatini. The initial themes emerging were that the Swazis are very proud of their traditions, value their cattle highly, find SLITS useful, and always consult their ancestors when important decisions need to be taken. However, as the data analysis progressed, it became evident that there was a clear divide in how the government addresses a problem compared to how a veterinary assistant addresses a similar issue. There was also a growing disconnect between the challenges of keeping one's family fed in a

working household and the king spending enormous amounts of money on a new freeway that only leads to the new King Mswati III airport. The first signs of the Swazis feeling discouraged were during the two informal interviews conducted in 2014. In all subsequent visits, it only manifested more.

In 2016, the overarching theme was that SLITS works well but that the veterinary assistants need more computers and access to the government's internet to capture all the data on the computerized system. In 2018, no new themes emerged, but in 2022, the following four themes were prevalent:

1. The marginalization of workers and communal farmers by the government.

2. The role of cattle in veterinary assistants and communal farmers' lives.

3. Hardware and software challenges and benefits.

4. Traceability and its portal to the worldwide market.

A hybrid framework addresses six identified themes in terms of context. The CICI framework will form the basis of the contextual findings concerning the themes, as illustrated in the framework's use of context domains. In addition, Hall's contextualization model will be used to further expand on the aspect of HC/LC. Two of the CICI framework's overall components - the implementation and setting – have previously been discussed.

ANALYSIS AND FINDINGS

Theme 1: Livestock traceability opens worldwide markets

Eswatini can export its beef as the SLITS system complies with all the mandatory legislation (Prinsloo, De Villiers, & McCrindle, 2018). As a result, all cattle are uniquely identifiable, and all movements are traced. Cattle are not fed illegal substances, are free of certain antibiotics, and are healthy, with no signs of foot-and-mouth disease. The Swazi Meat Industries, which acts as the export abattoir, is the gateway to the rest of the world and continue the traceability of the animal once slaughtered. Eswatini and the impact of SLITS can be seen on a micro level, impacting mainly the farmers, the cattle, and the veterinary

assistants, at a meso level, which context is the entire country, and its interactions on a macro level with its meat exports, as illustrated in Figure 3.
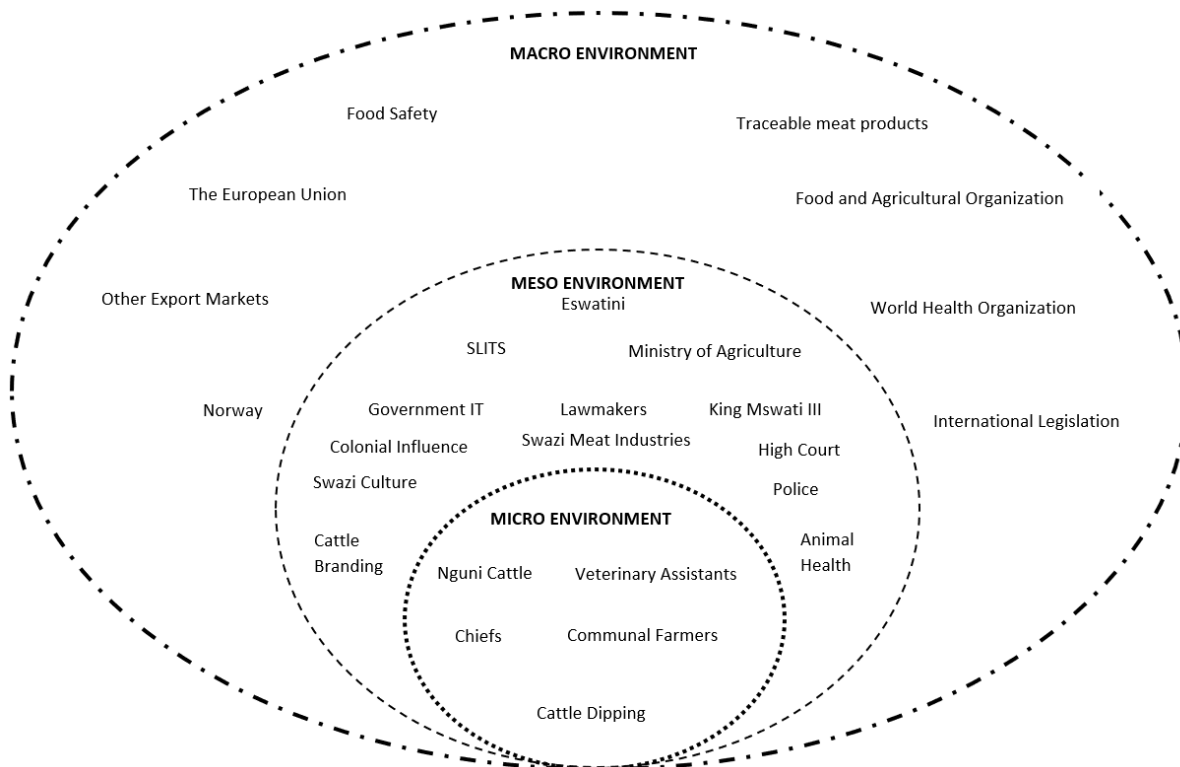
Figure 3. The contextual setting of the case study in its different environments. (Own research)

The country receives revenue from the meat sold and exported, while the communal farmer receives money for cattle sold to the export abattoir, adding to the socio-economic and socio-cultural context. Furthermore, all exported cattle must be healthy, addressing the epidemiological context. In addition, Eswatini is known for its ability to export meat, resulting in a more favorable political context in the overall geographical context.

Theme 2: The usefulness of SLITS

At the start of the SLITS implementation, the government of Eswatini envisioned the following benefits:

1. Improved access to markets of livestock and livestock products.

2. Assisting in the recovery and identification of stolen and strayed animals.

3. Assisting in the reduction of stock theft and cross-border cattle rustling.

4. Assisting in disputes over animal ownership among farmers.

5. Assisting in rapid containment of animal diseases in the case of outbreaks.

6. Assisting in production management.

7. Improved efficiency of government-controlled movement permits.

(The Government of the Kingdom of Swaziland, 2012).

SLITS proved to be very useful. A few other uses emerged during the interviews:

1. The police use SLITS extensively if a stray animal is killed on a public road. They use the unique number of the animal to trace its owner. Cattle roam freely in Eswatini, and accidents are frequent occurrences. The police must obtain the cattle's owner details from the main SLITS office in Manzini, as the police cannot interact with the system themselves. Figure 4 shows an example of the Swazi ear tag. The tag has the Swazi shield at the top, followed by the dip tank number, then the number of the animal in the dip tank area. No two animals have the same tag numbers.

Figure 4. An example of a Swazi ear tag.

2. The Master of the High Court uses SLITS to transfer cattle from the deceased owner to the new owner. Because of the value of livestock, they cannot simply be transferred to the farmer's eldest son but instead wait for the deceased estate to be finalized. Also, in ownership dispute cases, the high court intervenes.

3. Communal farmers can sell their cattle to either local markets or the Swazi Meat Industries for export. More options lead to higher prices for meat. Farmers usually sell their cattle if they are in dire need of money. One typical example mentioned repeatedly was paying school fees at the beginning of the school year. In addition, meat is in high

demand over the December period. Hence, farmers who sell their cattle in December generally receive more money than those who wait until January. The veterinary assistants try to educate the farmers on when to sell their cattle, but tradition is powerful. The Swazis only sell cattle when they have no other choice.

Theme 2 speaks to the legal, political, socio-economic, socio-cultural, geographical, legal, and political contexts. The ethical domain is addressed to a lesser extent, as the communal farmer is fined for their animal being hit on a public road. Not only is it a huge expense, but also a loss of livelihood. The animals roam on the king's land; should the king erect a fence?

Theme 3: The role of cattle in veterinary assistants and communal farmers' lives

The veterinary assistants had varying years of experience. Some only started working after SLITS was fully implemented, so they knew nothing else. Others were there much longer and talked about the struggles of tracing animals with merely a description of the animal. At the dip tank, the veterinary assistant counts how many animals every farmer brings, captures the data in the animal register, ensures that the animals are in good health, tags new calves from about four weeks of age, and notes any discrepancies with animal numbers. Animal deaths are also recorded; if the deaths result from illness, a veterinarian is sent to inspect the animal and take a smear for further analysis. Finally, the animals are dipped with a chemical called "Taktik," which mainly prevents tick-borne diseases. Cattle are plunge-dipped, as shown in Figure 5. Figure 6 shows the cattle register where all the details of the dipping event are captured manually, only to be transferred to SLITS later.

Figure 5. Cattle are plunge-dipped in a semi-rural area just outside Manzini.
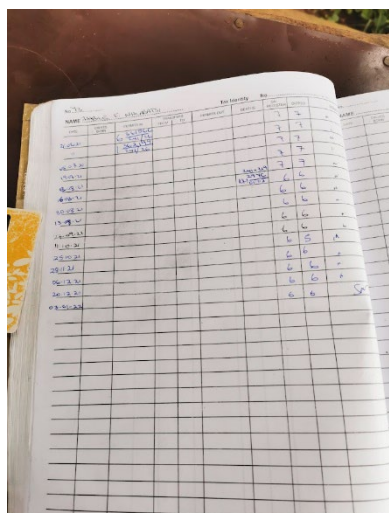
Figure 6. The animal details are captured manually at the dip tank.

For the communal farmer, owning cattle is expected. The Swazis generally keep their cattle for the duration of that animal's life. Although the farmers know that they can sell their cattle at a young age to a feedlot or abattoir, a farmer's cattle are their pride. Their entire culture is built around their ancestors and cattle in their homestead's kraal, the area where the cattle are kept overnight. It became evident quite quickly that communal farmers hardly ever ate their cattle. Instead, they would slaughter goats. Of course, it must be an exceptional occurrence for cattle to be killed, but those ceremonies were typically lobola (the bridal price), weddings, and funerals. Women can own cattle; that is not disputed. All Swazi traditions seem to have two things in common: the ancestors and cattle. Every ceremony explained in the interviews involves slaughtering cattle. Sometimes it has to be a bull; other times, a cow. Sometimes,

newlyweds eat specific parts of the animal during the ceremony. The lobola ceremony was also mentioned numerous times. In addition, there is dancing and singing, slaughtering of cattle, and the tradition of paying the bride's price of more or less 17 cattle for a Swazi bride.

The socio-cultural aspects regarding the role of cattle are of significance in this section, but other issues also stand out, for example, the socio-economic and epidemiological contexts.

Theme 4: The emphasis on culture in the context

The literature review section briefly touched on Eswatini's high-context culture, as did theme 3 above regarding cattle and tradition. Eswatini is a patriarchal society, with the male typically the head of the household. Women can inherit land from their husbands. ENL is given to a man who wishes to marry by the chief of that area. The newlyweds can then build their homestead on the land. If the couple decides to divorce, the woman and children stay behind, while the husband has to move away, but only if the woman has a son. An unmarried woman can also ask for land if she has a son. The rates and taxes on the TDL are rising sharply, resulting in more Swazis moving to ENL. However, the land is only so big, and chiefs have started to assign land to people in the dedicated grazing areas. Soon, the cattle will have nowhere to graze.

If a strange man is visiting the homestead, he needs to approach it from the kraal's side. The men stay on that side. The other side of the homestead is for women and girls. If you want to talk to your ancestors, you need to drink the Swazi-brewed beer and go to the kraal, where you keep the cattle. You can only connect with your ancestors by going to the kraal, according to the Swazis. A green, non-venomous snake also signifies the ancestors and should not be killed. All other snakes are signs of bad luck.

Swazis are friendly and usually agree with you to avoid confrontation. Cattle are seen as money in the bank, resulting in a higher return on investment than a savings account, as cattle reproduce quicker than interest accumulates. Families live together in homesteads, although the traditional homestead no longer looks the same today. Traditional attire is worn in certain ceremonies, as shown in Figure 7.

Figure 7. A traditional dance performed in Swazi cultural attire.

Other cultural aspects of the Swazi culture are essential to them, for example, the reed dance performed for the king. Unfortunately, a Swazi is not very forthcoming with information regarding their culture. It took many years of research and site visits to grasp a few cultural aspects. If one had to be insensitive towards them and not spend time with them to gain their trust, the outcome of this initiative would be uncertain, even if all the other aspects of the context were in place.

Theme 5: Hardware and software challenges

Some critical challenges of transitioning to SLITS were that the cattle were initially ear-tagged but not yet captured on the SLITS database, creating double work later, and creating grounds for error. There is also no access to SLITS at the dip tanks where they can easily generate the transaction without having to travel to the offices, and lack of sufficient and reliable computers and networks at the different offices. The lack of computers and the government network in the various offices also remained problematic. There is roughly one computer for every five veterinary assistants. In addition, old, outdated computers are not replaced fast enough, and not all offices have a reliable electricity supply. Therefore, a newer, updated version of SLITS that can perform basic transactions on an app on a mobile phone or tablet at the dip tanks would be preferred.

Nonetheless, almost everyone in the interviews is optimistic about SLITS. The feeling is it works and solves more problems than it creates. It is not in the Swazi culture to complain but also to see the positive side of any situation. The socio-economic, socio-cultural, and political domains in terms of the context are addressed in theme 5.

Theme 6: The marginalization of workers and communal farmers by the king's government

The veterinary assistants feel that the government is not supporting SLITS and not heeding their cries for help. They complain about the rising transport costs to travel to dip tanks and their offices and the lack of salary increases to sustain themselves and their families. They would also benefit from suitable protective clothing at the dip tanks, transport allowances, and lunch allowances, as these were things they received in the past but were stopped because of a lack of funds. Workers are called to meetings to discuss their grievances, but nothing seems to change, even after commitments are made.

The communal farmers struggle because of extreme poverty. They are forced to sell their livestock if they need money for any unexpected expense. Moreover, they cannot borrow money and use the land they live on as collateral, as the king owns the land. Overpopulation in the last decade has decreased land availability to house the Swazis and their livestock. The king insists on part-ownership in any newly registered business; he also owns a part of almost everything in Eswatini. Communal farmers are despondent, living in uncertainty, and growing in resentment. In June 2021, civil unrest broke out for a short while, but the quick and harsh responses faced by the people only led to further despair. The inhumane conditions in which most Swazis find themselves in link to the political, ethical, socio-economic, socio-cultural, and geographical contextual domains.

DISCUSSION

In summary, the researcher offers three findings:

1. Six general themes emerged from the data. Each theme described one or more aspects of the context. The themes illustrated the critical importance of the longitudinal aspect of the case study and how they aligned with the context domains of the CICI framework while also highlighting the role of culture in Hall's HC/LC.

2. ICT4D projects have a higher success rate if the research is done over multiple years. Although there does not seem to be a holy grail number of years prescribed in longitudinal case studies, the researcher found that with every project intervention, new data is gathered, and more aspects regarding the community in question become evident.

3. ICT4D projects are more likely to be successfully implemented if the research context is better understood. Furthermore, research contexts tend to be better understood and incorporated into the project design if more time is spent on familiarization with the cultural aspects of the context.

Below is a brief discussion of the case study's main contributions:

- Theoretical contributions:

    1. The cultural context is given more importance than the other contextual aspects in the CICI framework by expanding on the HC/LC continuum and how it can assist future researchers in understanding the local context better. The other aspects remain relevant and essential and should be addressed, but respecting and understanding the role of culture can lead to higher levels of successful ICT4D project implementations.

    2. Many theories and frameworks in ICT4D can be used to describe different projects. The vastly different projects focus on unique elements, making specific theories and frameworks more suitable. There is room for even more theorizing. It is not so much the case that one has to use a particular theory; however, the theory needs to address the context, as ICT4D research is context-specific.

- Methodological contributions:

    1. The longitudinal case study enabled the researcher to gain a rich contextual understanding of the communal farmers and the veterinary assistants, their everyday lives, and their challenges.

    2. The field notes used to formulate the themes resulted in an accurate depiction of the experiences.

    3. Together all the evidence leads one to gain a complete picture of the impact of the traceability systems on the communal farmer and veterinary assistant.

- Practical contribution

    1. A true Swazi cultural experience made it possible to witness what a proud nation the Swazis are, how they value culture and tradition, and what makes their setting unique.

    2. To be able to visit the country, to see the landscape, drive the poor dirt roads, see the small children running alongside the vehicle, and just experience the communal areas leaves one with a sense of more than theoretical knowledge, but with a commitment to telling their story from a vantage point of true compassion.

CONCLUSION AND FUTURE RESEARCH

SLITS transformed many lives in Eswatini. Eswatini has access to international beef export markets, where they can compete globally. The longitudinal case study presented in this paper spanning from 2012 to 2022, provides a brief glimpse of the turmoil and hardships the communal farmers and the veterinary assistants are subjected to. Yet, they remain a proud nation. Their highly contextualized culture is seen in how they interact with one another and outsiders. To gain a Swazi's trust is not easy and takes time. Yet, it is worth the time and effort to travel to the country, as one is richly rewarded. This paper links two frameworks to describe the Eswatini context better but does not advocate for any specific theory or framework to be used. The context will dictate the theory.

Future research

Several aspects or constructs overlap in longitudinal case studies, especially ICT4D context-specific studies. Therefore, the researcher intends to map many longitudinal ICT4D case studies and identify similar constructs. In determining the overlapping aspects, a framework will be designed that should be able to apply to a broader scope of projects, eventually leading to some widely-acceptable framework that can be used in describing ICT4D studies more uniformly.

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