

# Social impacts of dams: Learning from lived experiences of Maphilingo community, Eswatini



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The World Commission on Dams (WCD) highlights the crucial issues of social impacts of dams on local communities and emphasises that these have been neglected in the quest for eradicating poverty through infrastructure development. The broader questions of equity, community engagement and learning and others remain important in community development. This study builds on existing knowledge to assess learning from the social impacts of Lower Usuthu Smallholder Irrigation Project (LUSIP). A primary research was conducted in the Maphilingo Community Eswatini, which is in a rural setting. This article employs a qualitative approach to assess the learning resulting from the lived experiences of the Maphilingo community regarding the LUSIP project, using 32 semi-structured interviews, document review and observation. The community experienced positive and negative social impacts of the dam. Benefits were few and inequitable. Project spin-offs were minimal. Hence, community engagement was not meaningful, resulting in nominal learning opportunities. Communities normally learn considerable skills while working in project spin-offs like piggeries, that usual accompany dam projects. Hence, dam proponents should bring more project spin-offs, to optimise benefits and learning opportunities.

**Transdisciplinary contribution:** This study utilises the social engagement school of thought for transdisciplinary research, merging development studies and pedagogical approaches. It integrates the WCD Framework and the Transformative Learning Theory (TLT) to form its conceptual basis, aiming to capture community experiences and learning from these experiences.

**Keywords:** dam; local communities; lived experiences; Transformative Learning; Eswatini; LUSIP.

## Introduction

The Eswatini economy relies heavily on agriculture, prompting the establishment of the Eswatini Water and Agricultural Development Enterprise (ESWADE) to empower rural communities and reduce poverty through irrigation. Ndlovu et al. state that ESWADE helps farmers create irrigation schemes using water for developmental change.<sup>1</sup> The Maphilingo community, for example, has one sugarcane scheme and two greenhouse gardens. The development also promised significant indirect benefits, such as improved roads and health infrastructure.<sup>2</sup> However, studies on the Lower Usuthu Smallholder Irrigation Project (LUSIP) revealed that some communities struggle to realise these benefits,<sup>2</sup> leading to disappointed communities.<sup>3</sup>

While experiences of dam social impacts on local communities have been documented, few studies have documented how local communities have learnt from such experiences. Learning from dams' social impacts brings a voice of lifelong relevance into the study of social impacts of dams, thereby offering transdisciplinary (pedagogical, emotional and practical) significance to the study.

Cranton et al. have alluded to the application of the Transformative Learning Theory (TLT) to different contexts including community projects, groups of people who meet and discuss issues informally, environmentalist groups and the like.<sup>4</sup> Numerous academics<sup>4,5,6,7,8</sup> have successfully conducted research on the application of transformative learning in different contexts, using different approaches, strategies and methodologies.<sup>4,6,7,8,9,10</sup> While considerable research has incorporated TLT into natural resource management,<sup>4,7,11</sup> not much has been done on transformative learning emanating from the social impacts of dams.

## Background to the social impacts of Lower Usuthu Smallholder Irrigation Project on the study area

The LUSIP Dam falls under the category of one of the largest dams globally, that Kirchherr<sup>12</sup> claims is less researched. The Dam is 48 m deep and occupies 398 ha of land belonging to Maphilingo

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Chiefdom, which is one of the poorest in Eswatini.<sup>2</sup> As mentioned by Gunda et al., it is also the most affected by the dam construction and canals but has benefitted the least.<sup>13</sup> The dam necessitated relocation of homesteads and graveyards, and this had been projected to result in negative social impacts.<sup>2</sup> Some community members felt that compensations were inadequate; some highlighted that they were not compensated for land that was repatriated to the sugarcane scheme. It was confirmed by Gunda et al.<sup>13</sup> that ESWADE found it difficult to compensate those affected by the development of irrigation infrastructure. The dam inundated 1704 ha of grazing land and 385 ha of agricultural fields, while the canal network occupied 30 ha of agricultural fields and 263 ha of grazing land.<sup>2</sup> This affected livestock, which was the main livelihood for many households in the area. This was later confirmed by Dlamini, 2020 (personal communication, April 2020) that a direct result of loss of grazing land is that households were told to reduce the number of cattle and were introduced to the concepts of commercial live stocking and sugarcane growing. Yet, commercialising subsistence agriculture has not benefitted rural farmers in terms of food security.<sup>14,15</sup> Government buying a farm for the community would compensate the lost grazing land;<sup>13</sup> however, this had not happened by 2020. Gunda et al.<sup>13</sup> have stated that this became the impediment for approval and implementation of Maphilingo Development Plan, which has delayed the accrual of benefits in the community. Gunda et al. have stated that procedures for land sharing between families whose land was being irrigated and those without access to irrigated land proved unsuccessful for government and hence were left to local arrangements.<sup>13</sup> This not only led to conflicts but also resulted in families trying to claim back their land afterwards.<sup>13</sup>

When SWADE introduced the LUSIP project, it included various smaller projects like a water and sanitation programme, a piggery project, a livestock project, a High Value Crop and Horticulture Project (HVCHP) and backyard garden infrastructure.<sup>2</sup> However, the water scheme collapsed because of poor management skills, among other factors.<sup>1,13,16</sup> This was later confirmed to have resulted to the failure of the greenhouse gardens for relocated households and prevented most project spin-offs from taking off (Shongwe, 2020, personal communication, May 2020). Water availability was inconsistent, causing conflicts among community members. The sugarcane scheme was the only viable project, but it had not significantly benefitted its members because of high running costs. Low literacy rates in the chiefdom necessitated training to impart technical knowledge for running the projects. The community had a positive attitude towards the dam development and was eager to learn new skills.<sup>17</sup> Nonetheless, Ndlovu et al. note that the schemes failed because they were handed over to the community too soon.<sup>1</sup> Additionally, two households were significantly affected by the dam's social impacts, with issues related to cattle deaths at the dam site and fragmented graveyards during relocation. The chief advised against taking legal action to ensure a good working relationship with ESWADE. Terry et al. affirm that the extension of the sugar industry onto Swazi Nation Land (SNL) has not significantly altered the relationship between chiefs and their subjects.<sup>15</sup>

## Conceptual framework

Kirchherr et al. highlight that frameworks serve as essential starting points for researching the social impacts of dams.<sup>12</sup> Frameworks outline the research components and help position the analysis and results. For studying the social impacts of the LUSIP Dam, the World Commission on Dams (WCD) Framework<sup>18</sup> was used, incorporating some terminology from the Matrix Framework, such as *dimensions* and *components*.<sup>12</sup> The WCD Framework was selected because of its openness and robustness, accommodating a wide variety of social impacts. It offers flexibility, allowing researchers to include relevant social impacts and exclude irrelevant ones (e.g. electricity provision for LUSIP Dam). Social impacts in context to the study were categorised into three components: livelihood, infrastructure and community.

To evaluate learning from social impacts, the study employed TLT, initially proposed by Mezirow.<sup>19</sup> Transformative Learning Theory describes the process of transforming problematic frames of reference to make them more inclusive, open, reflective and emotionally adaptable. Yee et al. illuminate that such transformations often result from a 'disorienting dilemma', which could be extreme like death of a relative, or moderate, such as changing livelihood and relocating.<sup>11</sup> Frames of reference encompass structures, rules, criteria, schemas, values, personality traits and dispositions. Mezirow<sup>20</sup> outlines examples of schemas such as feelings of unlovability, mistrust, social exclusion, failure and subjugation. Diduck et al. argue that transformations in these frames result in better-justified assumptions and more reliable beliefs.<sup>21</sup> Mezirow<sup>20</sup> distinguishes between instrumental and communicative learning within TLT. Instrumental learning is task oriented, involving manipulation of the environment while communicative learning focusses on understanding and expressing ideas, often requiring confrontation with the unknown. Both types of learning frequently overlap.

Transformative Learning Theory emphasises adult learning, valuing situations that compel adults to engage in dialogue and learn from each other.<sup>9,10</sup> Bostrom et al. encourage development practitioners to guide this transformative learning in a positive direction.<sup>8</sup> Diduck et al. assert that TLT is particularly promising for examining learning through participation, explaining both individual and social learning processes.<sup>21</sup>

The study integrates the social engagement school of thought for transdisciplinary research, combining development studies and pedagogical approaches. It merges TLT and the WCD Framework to form its conceptual basis, aiming to capture local knowledge, community experiences and the learning derived from these experiences.

## Research methods and design

To achieve the study's objective, a qualitative research design was selected, appropriate for a transdisciplinary study aiming for a detailed understanding of complex issues. Creswell<sup>22</sup> emphasises that a well-designed study makes

findings relevant to a broad audience. A case study approach was employed, defined by Cohen et al. as a bounded system that examines real people in real-life situations, providing a unique perspective compared to abstract.<sup>23</sup>

The study focussed on the Maphilingo Chiefdom community, characterised by a strong rural background and are real life examples of a cultural stereotype. The population was distributed across six areas [*tigodzi*] within the chiefdom, with all members present since the LUSIP Dam project's commencement in 2003.<sup>15</sup> Purposive and snowball sampling methods were used to select informants. The researcher initially identified a contact person in the community who facilitated access to five key informants. These informants then helped identify others, resulting in a total of 32 informants who had experienced various social impacts from the dam.

Informants participated in semi-structured interviews lasting about 90 minutes. All interviews were conducted in the local siSwati language, ensuring comprehension. Participants consented to being audiotaped, and measures were taken to ensure confidentiality as stipulated by the University of South Africa code of ethics. Informants were assigned codes. The interview guide was piloted and adjusted to clarify questions on transformative learning, aligning with the principle of social relevance in transdisciplinary research. The researcher minimised their influence on informants by being aware of their own biases during data collection. University Research<sup>24</sup> advises that transdisciplinary researchers should practice humility to ensure they do not dismiss other perspectives.

In addition to interviews, observation and document analysis were conducted for triangulation purposes. The researcher acted as a participant observer in community meetings and observed the dam site and related infrastructure, which improved data reliability by minimising social desirability bias and reducing reliance on second-hand interpretations. Documents were sourced both online and from the community. Yin<sup>25</sup> recommends accessing at least six data sources, including documentation, archival records, direct observations, participant observation and physical artefacts. This multi-source approach ensured a holistic understanding of the transdisciplinary issue. Thematic analysis was used to analyse data from all sources. The analysis was theoretical, based on the research questions and the researcher's focus, rather than inductive and data-driven.

## Ethical considerations

Ethics approval to conduct the study was obtained through the University of South Africa, ethical clearance number: 2020/ CAES\_HREC/054. The purpose of the study was clearly explained to the participants. Each participant gave individual consent for participating in the interview. No names were recorded, and participants were informed of their right to leave the study at any time if they so wished.

## Results

An exploration of the community revealed some community values, which are key in guiding transformative learning. Three themes were applied from the TLT, which were: communicative, instrumental and perspective transformation. Learning gaps were also identified from the data, and the gaps are important for guiding future dam projects on community learning needs.

## Community values

Findings of this study show that the community upheld respect for fellow community members, and for leaders. Informant 10, who was aggrieved by the dam fragmenting their family burial grounds said:

'With the graves issue, I went to the chief, and he was able to call ESWADE ...' (Interview 10, Female, 42 years old)

Informant 11, who also consulted with the chief regarding cattle that died in the dam stated:

'Ehhhh ... when you live in a community, you must follow the community structures ... when I went to the chief, I wanted to tell him that I had decided to open a court case against ESWADE. When we talked, we agreed that such a move would reflect badly on the community, we would be regarded as a community that is fighting development.' (Interview 11, Male, 65 years old)

The chief was also obliged to protect the community's interest:

'[T]he chief said we should report to him all the problems that we have concerning LUSIP dam project.' (Interview 13, Male, 70 years old)

Informant interviews revealed that the chief protected the interests of the community by not signing the Community Development Plan (CDP). Key informants also acknowledged that the chief thought that signing the CDP meant giving away the people's land. An informant said:

'We caused the delay as the Maphilingo community ... because you can't just point at one person when we're all here ... to the chief it felt like the signing was equivalent to selling the land off ... as if the land is now being lost ...' (Interview 6, Female, 45 years old)

Some informants purported that the community did not only protect their chief but were also protective towards one another, as they were a closed community where most people are related:

'This is what we were supposed to investigate ... but when you investigated deeply, you found that your brother had a case to answer ... That is the problem. We are investigating our own blood ... when you start seeing the truth, you hide your eyes and leave it at that.' (Interview 16, Male, 38 years old)

While this was an act of love and unity, it failed the purpose of the Disciplinary Committee in the sugarcane scheme.

Some informants felt that ESWADE was letting down the chiefdom because the chief was not well educated.

Informants alleged that neighbouring chiefdoms received better treatment from ESWADE:

'... [W]hat causes us pain is that learned people, once they realise that "oh, this chief is not educated" then they use the chief as a bridge.' (Interview 17, Male, 58 years old)

'If they had told us that the dam came for Madlenya and Ngcamphalala we would not have done all these attempts ... We would have just looked at their dam and demanded God's water, which we have been using all our life ...' (Interview 9, Male, 75 years old)

Overall, there was unity between the chief and the subjects as Terry et al. have alluded that the extension of sugarcane growing to SNL has not substantially altered the relationship between chiefs and their subjects since chiefs were not involved directly in management.<sup>15</sup> Truthfulness was another value of this community, as it kept cropping up during the interviews:

'It was better before the dam came. I'm glad that I am saying this, I'm still alive to say it ... because I don't want anyone to speak on my behalf ... it was much better before.' (Interview 9, Male, 75 year old)

Informant 16 said:

'Here at home, they know that I don't easily become scared ... I just stand by the truth. Even now I live by that.' (Interview 16, Male, 38 years old)

Informant 4 alluded to being truthful:

'Even now I don't know how to hide the truth ... I don't know how to cover things up ...' (Interview 4, Male, 80 years old)

Another value of the community was the stewardship principle. They were keeping an eye on the garden material that was stored by ESWADE in their community. They thought that the material belonged to the community as most households did not get backyard gardens:

'While I was at my departed brother's home, I saw a lorry going up to the depot. I went inside the site and asked the driver where he was taking the garden material. He said it's going to Madlenya. I said these poles are not going anywhere. I called a community elder staying close by and we stopped him.' (Interview 17, Male, 58 years old)

Ntseane<sup>26</sup> illuminates that the value of obligation, which in this case include truthfulness and stewardship, relates to spirituality that results in a sense of obligation to the community, extended family and oneself.

Some community members value livestock and felt that the dam deprived them of their livelihood and pride.<sup>16</sup> Neighbouring communities that had a number of sugarcane schemes had no grazing lands; therefore, they drove their cattle to Maphilingo chiefdom where there is only one scheme. Informant 17 said:

'Madlenya people ... drive hundreds of cows up and down our chiefdom ... Yet, we were told to get rid of our cattle ... As Maphilingo community we are seriously pained by the issue of

cattle. This development deprived us of our cattle and grazing lands.' (Interview 17, Male, 58 years old)

The community also valued education. Everyone wanted to learn because there was a general belief that when you are enlightened, you can make better decisions. Hence, the attitude to the project was positive because they were eager to learn new ways of making a living.<sup>17</sup>

'I think education is important ... and limited education can cripple you ... simply because you don't know other things. Yes, we were eager to learn.' (Interview 6, Female, 45 years old)

In support of this, Informant 16 said:

'In the current board, we elected learned people, so that they can be able to respond to our questions and learn from their mistakes ...' (Interview 16, Male, 38 years old)

The previous board had comprised of people with limited education. Nkambule et al. noted poorly supported management, land ownership issues, inactive members and conflicts and poor cooperation between members and the management as causes of the failure of LUSIP schemes to contribute to households' income.<sup>16</sup> On the other hand, the WCD<sup>18</sup> emphasises training support for marginalised groups.

While this belief seems to be common, some elderly folk were sceptical about educated people:

'You see a learned person will tell you, "wait here ... sit here ... there is something nice that I will bring you" while that person is splashing mud at your face. There is something that he wants to benefit from you.' (Interview 9, Male, 75 years old)

As expected, the elderly valued tradition and culture:

'[I]n all the time that I have lived, I have not seen what I am seeing now. I mean, it is hard for me to explain the khonta process now because they say, "things change, we are developing" ... maybe this [culture] is backward, I don't know.' (Interview 4, Male, 80 years old)

The elderly were disappointed when tradition was not followed and they felt disrespected. Hence, they lost interest in the activities of LUSIP. An elderly informant said:

'[W]hether they are discussing development, forming project groups, or what, what, I just sit down ... and just wait for my dying day.' (Interview 25, Male, 70 years old)

## Communicative learning

Communicative learning as described by Mezirow<sup>20</sup> usually involves understanding what others mean and the ability to make ourselves understood as we attempt to share ideas. It involves understanding our own needs and the needs of others. Some informants felt that people needed to be taught about certain concepts as they would not appreciate them otherwise:

'[P]eople were taught how to keep cows in a feedlot ... they did not quite appreciate the principle of collective feedlots. It didn't go down well with them ... they want to fill up their kraals with thin cows ...' (Interview 5, Male, 80 years old)



Some informants had been trained in some aspects of project spin-offs such as piggeries, feedlots and other projects, but felt that the training was not adequate:

'We did a bit of training on livestock rearing wisdom in general. But I say to myself: "even a child, you first hold its hand when she learns to walk. Then you let her walk ... even then, you should be close by to pick her up when she falls".' (Interview 19, Male, 55 years old)

Nevertheless, some community members understood the information when it was explained to them during a dairy workshop that government would not give them free cows if they did not have water:

'They explained to us that government is no longer giving free cows if you can't convince them how you will water the grass ... because a lot of cows die from hunger and some of us understood that.' (Interview 5, Male, 80 years old)

Other informants learnt reporting skills through participation in LUSIP committees:

'Then I was supposed to report progress to the planning committee frequently ... That helped me because some of the things I would get more knowledge on ... I realised that I almost missed some things due to lack of understanding and knowledge ... I learnt a lot ... that learning made me able to be part of discussions on that topic and voice my own informed opinion.' (Interview 5, Male, 80 years old)

Some informants mobilised fellow community members to try doing their own projects that could sustain their livelihood, without the assistance of ESWADE:

'I have motivated some community members to join me in a fruit trees planting project because they do not need too much water. I had seen fruit trees at Tambuti and they are profitable.' (Interview 9, Male, 75 years old)

In the same vein, Informant 10 mobilised her extended family members:

'When the chief gets better, I will organise a meeting under that tree ... We need to discuss the issue together because our land is there, lying idle because we have no means to irrigate.' (Interview 10, Female, 42 years old)

The WCD<sup>18</sup> noted that mobilisation on social impacts of dams resulted from inadequate and unacceptable solutions to problems around these issues. The community is already showing social mobilisation because of inadequate attempts by SWADE to restore community livelihoods.

A 75-year-old male informant described his own transformation process, showing an understanding of how perspectives change:

'[Y]ou see, before you do something ... the idea must be part of your being ... ask yourself over and over about it ... ask yourself many questions until that idea becomes you ... As opposed to being pushed like a wheelbarrow ... This thing must drip down ... from your brain through your veins ... and you look ahead of yourself ... and see yourself benefitting in spite of everything ...' (Interview 9, Male, 75 years old)

Informants 9 explained that they did not understand that when the dam came it was going to take things that were dear to them and give them nothing in return: It was only later that they understood their loss:

'We needed to understand what was happening ... then we would be able to explain when someone asks us, just like you are asking now ... that "we found ourselves in this disaster of something that is beyond our level of solving, beyond our level of understanding ... here, this dam came to trap us, to remove our underwear in public."' (Interview 9, Male, 75 years old)

World Commission on Dams<sup>18</sup> emphasises the importance of empowering local communities and that a provision must be made for training and support through joint negotiation, according to community needs. Hence, the community members should know their losses and their gains in order to take informed decisions.

## Instrumental learning

Instrumental learning involves the acquisition of new knowledge and skills, designed to control or manipulate the environment. Mezirow<sup>27</sup> added that it involves making predictions about observed physical or social events, whether correct or incorrect. Eswatini Water and Agricultural Development Enterprise trained community members on projects such as piggeries, dairy businesses and business management skills in general. Some informants learnt some skills from ESWADE trainings:

'My thinking was that if you sell E100 goods you can take the E100 and spend it ... but I learnt that you only take the profit at the end of the month, after deducting capital and electricity and other expenses.' (Interview 12, Female, 45 years old)

However, for skills that were more technical, the training they received was not adequate:

'[B]ut to start a piggery, I would need further training because our training was not practical. There were no piggeries to practice that skill.' (Interview 12, Female, 45 years old)

Nonetheless, for informants who had personal feedlot businesses, the training was meaningful because they were learning on the job:

'... Even though there is no business that they have given you, you get skills through their training ... I can make an example of myself with my feedlot, they helped me take my project to another level ...' (Interview 6, Female, 45 years old)

Informant 5, who served in committees, learnt some legal procedures through their experience in the committees:

'[B]ut learning how government works with funders made me able to be part of discussions on that topic and voice my own informed opinion ...' (Interview 5, Male, 80 years old)

Informant 16, who was the chairperson of the water scheme and collecting water tariffs, learnt the importance of presenting reports on public funds:

'We have been taught that if people are sceptical about how you manage their money, you should never blame them if you did not give them a report on how you used it.' (Interview 16, Male, 38 years old)

Informant 22, who was employed in the sugarcane scheme, learnt some technical skills:

'[W]hen you engage in development, you do things you never did before ... you learn by being active in the projects ... you get skills which you can teach someone who doesn't have them.' (Interview 22, Male, 37 years old)

Informant 8 also learnt some skills:

'I can now plumb a whole field for you because I was involved in plumbing Umchwele Sugarcane Scheme and I still work there. I have also learnt which implements are applicable to sugarcane farming ... like the best fertilisers for it to grow well.' (Interview 8, Male, 39 years old)

By predicting that ESWADE was using the community to get funding for their own use, based on the observation that their community was not benefitting much, informant 9 exhibited instrumental learning:

'You see, a learned person will tell you, "wait here ... sit here ... there is something nice that I will bring you" ... Be careful! There is something that he wants to benefit from you ... He will go to other countries to look for money through you.' (Interview 9, Male, 75 years old)

Some informants were also able to predict that if the greenhouse gardens depended on the community water scheme, they would not be successful:

'We went to Nkomazi to observe tunnels. We found two schemes; one was sharing water with households. The other one used an engine to pump water from the river. The one using river water had beautiful tomatoes. So, I told ESWADE, "no guys, I've seen this system, it doesn't work well." ... but they did not listen.' (Interview 5, Male, 80 years old)

Informant 20, who was a members of the sugarcane scheme, learnt some economic procedures as they tried to find assistance from other companies on their own. Being able to create partnerships is part of learning:

'Because ESWADE has abandoned us, we engaged Swaziland Industrial Development Company [SIDC] to seek assistance on how to bring together our bank loans and get them to pay off the small bank loans which are draining the scheme. SIDC is currently advising us on that.' (Interview 20, Male, 56 years old)

Four informants gained the skill of registering a company but not of starting a business:

'In this chieftdom we registered companies which are not functional even today. Companies for feedlots, piggery businesses ...' (Interview 5, Male, 80 years old)

The WCD<sup>18</sup> encourages dam developers to provide training support for self-employment, imparting household-related skills training. Some community members received training by being involved in a particular project spin-off. Yet, skills

for self-employment would mean that trainings should be open for any interested community member.

Informant 5 emphasised the importance of procedural certainty when explaining that he had been pursuing the issue of water rights to start his dairy cow project. He never got a straight forward response, instead he was sent from one official to another:

'They make it look like you are the one who is not explaining clearly what you want. Yet they don't give you a clear procedure ... in the end, you can't say they didn't help you.' (Interview 5, Male, 80 years old)

This is contrary to the rights-based approach recommended by WCD<sup>18</sup> to formulate a procedural framework. Such an approach provides free and informed negotiation process. Moreover, Fitzpatrick<sup>28</sup> noted that procedural complexity and uncertainty manifest in instrumental learning outcomes related to legal, administrative and political procedures.

## Perspective transformation

The study sought to investigate the narratives of informants who transformed their perspectives. Experiences that led to perspective transformation were in changing the place of women in the community, lack of water for household use, lack of project spin-offs in the community, relocations and changes in belief systems.

On changing the place of women in society, Informant 6 had this to say:

'I can't be without a job as a woman, and be a woman who does nothing ...' (Interview 6, Female, 45 years old)

Informant 7 found work in schemes outside the chieftdom:

'I'm not for the tradition that a woman's place is in the kitchen or home and not at work ... I had to come out of that thinking because I realised that I don't have a husband, so why should my kids suffer?.' (Interview 7, Female, 41 years old)

Informant 2 found work, while the husband remained at home and did the cooking. Something that was not common in the community:

'My old man and I understand each other ... when I come from work at 6 pm, I find him already cooking. He understands because when I am paid, I give him some money for entertainment ...' (Interview 2, Female 50 years old)

The WCD<sup>18</sup> emphasises a need for improved understanding of how dams impact on women and gender relationships, noting that social and family support may be crucial in rural areas especially, to assist women to have access to opportunities offered by dams.

Competing for water for household use seemed to cause schemas among community members. Mezirow<sup>20</sup> describes schemas as feelings of being loved, feeling unloved, mistrust, constant suspicion of betrayal, the feelings of not belonging, a sense that one cannot succeed at what they do.

These schemas are considered as new frames of reference. Some areas in Maphilingo chiefdom would sometimes get water while other areas did not. Informant 12 felt looked down upon after realising that other areas got water while their area continuously did not get water:

'As for me, the day I went to Thandweni and saw water spurting from a tap while our taps were dry, I decided to stop paying ... do we belong to this chiefdom for real? When they talk about us, they talk about farm people because we are behind ... Indeed we are behind because we get nothing!' (Interview 12, Female, 45 years old)

There was a general inadequacy of project spin-offs in the community. The only sugarcane scheme was located at Thandweni area. Informant 1, from another area, lost a sense of belonging when he realised that there were no project spinoffs in Mhononweni area:

'We feel lost because Thandweni has a sugarcane scheme, while we got nothing. We feel very small ... who do we belong to?' (Interview 1, Male, 40 years old)

Informant 19 felt excluded when other households were relocated from the dam site, and their family was left behind, whereas they had initially been earmarked to relocate:

'We felt excluded when SWADE left us all alone by the dam ... yet we had been earmarked to relocate.' (Interview 19, Male, 55 years old)

Because of lack of water, some households started planting drought resistant crops that were not part of traditional Eswatini culture: Informant 13 had this to say:

'It has also changed the way I think because it's not normal in our culture to plant cassava, but I plant it. We were not used to eating it but now I eat it because I cannot plant maize in this dry area. What can I eat? When you have a problem, you do what will help you.' (Interview 13, Male, 70 years old)

Land speculations led to a breach of culture by some community members. Informant 14 (an elderly, female) went against the *khonta* culture and sold her land rights to an outsider. There was widespread land speculation, as there was an influx of new homeowners in the chiefdom. She realised that other people were benefitting from their land while she had not been compensated for her land that was used to settle households that relocated from the dam site. She was promised that she would be reimbursed from the farm that had not been bought yet. Nonetheless, Mudzengi<sup>29</sup> warns that disputes may also arise from moving displacees to land claimed by others. She had this to say:

'So now I have allocated my land to this person I was talking about, because I'm also hungry, I must get mealie meal ... It's better than folding my hands and watch people benefitting from my land.' (Interview 14, Female, 80 years old)

Informant 16 learnt that family could no longer be trusted to protect one's interest:

'As the youngest brother my brothers were supposed to protect me, but they deprived me of family land. I have learnt to make sure that I protect my own interests ...' (Interview 16, Male 38 years old)

Some informants learnt important social skills as they experienced social impacts of LUSIP Dam:

'This dam project has taught me a lot in terms of working with people in general ... I learnt to be patient in whatever ... I also learnt to be courageous ... stand by my beliefs, prove myself, and don't hold grudges ...' (Interview 11, Male, 65 years old)

Some informants changed the way they understood development projects:

'... I'm now scared of such developments ... outsiders benefit from your land while your children lose that benefit for life ... I'm scared ... I'll never join such things in future. They would rather take my land forcefully, not with my consent.' (Interview 23, Male, 47 years old)

Informant 24 felt the same way and stated:

'If another development project can come to our community, I would only join through coercion by others. Even then, I would say, "go, I will follow you."' (Interview 24, Male, 45 years old)

Other informants changed the cultural belief that youth practice swimming skills in the river. Children did this in the canal. However, accidents changed this belief for Informant 5 who was traumatised when their child almost drowned in the canal:

'[T]he kids in this area normally go to the canal for a swim when it's hot...they thought the canal was a river. But from the day my son drowned I said no more going to the canal for any reason, even to fetch water. I now make sure that I buy water from tankers.' (Interview 5, Male, 80 years old)

Perspective transformation should lead to better-justified assumptions and beliefs that are more reliable in navigating everyday life experiences.<sup>21</sup> It is therefore important that developers steer it to the right direction.<sup>8</sup> Fisher-Yoshilda et al. opine that it also changes the way people view themselves and others.<sup>9</sup> Some transformations of perspective in the community are negative transformations. For instance, having a community shying away from development projects is detrimental to its own progress. This highlights the need for training the community on collective development.

## Mapping the dilemmas through the perspective transformation process for informants

A total of nine informants transformed their frames of reference. Two informants were selected from those (Interview 14 and Interview 7) and their narratives were analysed in relation to the six stages of the transformation process (refer to Table 1). Disorienting dilemmas were related to land, unemployment, women's roles in society and an unprofitable sugarcane scheme. All individuals who experienced perspective transformation went through self-examination, questioned their beliefs and norms and consulted others in the community. They ultimately adopted a new belief system and confidently pursued a new way of life.

## Identified knowledge gaps

Some informants expressed a desire for learning about greenhouse gardening:

**TABLE 1:** Perspective transformation for informants in the study.

Stages in the transformation process	Excerpts	
	Interview 14, 2020	Interview 7, 2020
Disorienting dilemma	'I should be thinking what I could do about it [my land] ... because a lot of my energy was wasted in it. When I pass by it, I look at it and think to myself ... this is my energy ... I have decided to sell the little land that is left ... If I don't sell this land, what else can I do? I have seen them allocating people's land at random until there was no more land to put them.' (Interview 14, Female, 80 years old)	'I'm not happy with the sugarcane scheme. We don't get anything. Since inception, we only managed to get E3000 in total. Imagine! All these years?.' (Interview 7, Female, 41 years old)
Self-examination with feelings of fear, anger, guilt or shame	'Even if he puts someone there, he was supposed to consult me, because it is his brother's land ... because as my husband's brother, he was supposed to stop people from taking my land. But nowadays it's every man for himself! No one will fight your battles.' (Interview 14, Female, 80 years old)	'I looked at this thing...asking myself many questions about how I can have a better life ... and made a decision that no! I must stand up from my sitting position and go to work for my kids. When my kids die of hunger, I will be to blame.' (Interview 7, Female, 41 years old)
A critical assessment of assumptions and expectations, norms	'Must I not eat anything from the land I worked for? No, I must get something ...' (Interview 14, Female, 80 years old)	I realised that I don't have a husband, so why should my kids suffer when I am alive as their mother? Just because I'm busy saying I am a woman?.' (Interview 7, Female, 41 years old)
Recognition that one's discontent is shared and planning for action	'When I said to my husband's brother "please go and talk to the SWADE people on my behalf" he said "leave me alone, why don't you go and talk to them yourselves? You want me to die and leave my children behind?" If I don't sell this land, what else can I do? I have seen them allocating people's land at random until there was no more land to put them.' (Interview 14, Female, 80 years old)	'... To open the chance for working outside the community, I talked to some community people who already work in these schemes at Madlenya chieftdom. They told me that there is life in working in the schemes.' (Interview 7, Female, 41 years old)
Acquiring knowledge and skills for implementing one's plans	'People who are not even from here originally are selling land and making a living ...' (Interview 14, Female, 80 years old)	'I thought about it and decided to join them. I later realised that indeed I was making a living, it is doable ...' (Interview 7, Female, 41 years old)
Building competence and self-confidence in new roles and relationships	'So now I have allocated my land to this person I was talking about, because I'm also hungry, ... I had planned to go to John (not real name) today to tell him not to be surprised when he sees someone on that land because that person has my permission ... since I don't see how it can happen that I die in poverty while I have my field.' (Interview 14, Female, 80 years old)	'I'm not for the tradition that a woman's place is in the kitchen or home and not at work ... on my side, I find this life very much okay. The work is taxing, but it helps us ... I will not be able to stop doing that, unless there is no longer a job for me.' (Interview 7, Female, 41 years old)

'I had an interest to learn about growing vegetables in a greenhouse ... to learn for my own knowledge ...' (Interview 5, Male, 80 years old).

Informant 19 raised the need for teaching people about sustainable ways of harvesting medicinal plants:

'People lack knowledge on how to harvest the trees, especially those where the bark is required. They remove the bark in such a way that they kill the tree, not knowing that they are killing themselves ...' (Interview 19, Male, 55 years old)

Some informants highlighted the need for intentional training on how debt accumulate. This need must have been motivated by the sugarcane scheme, which was debt ridden. Nkambule et al. have stated that LUSIP irrigation schemes are faced with conflicts arising from lack of training on management, among other issues.

'Everything starts well, and before you know it, projects are laden with debt ... but the chairperson never really tells you how the debt was accumulated. So, I think training on that was particularly necessary [for the sugarcane scheme] as they knew they were dealing with community people who are not learned.' (Interview 16, Male, 38 years old)

An understanding of how things operate was also key in having meaningful engagements in community development projects. This is what Informant 16 said:

'... [T]he people did not understand the implications of that [election of board members], but they were ferried using a private vehicle, for electing the chairperson. Unfortunately, this person was not well educated ... you know when people who are not learned do corruption ... they fail to even calculate things and have no regard for the impact on the company ...' (Interview 16, Male, 38 years old)

## Key findings

The environment of the individual influences the transformative learning process, including perspective transformation. Maphilingo community is a community that values respect for their leaders, fellow community members and outsiders. The leaders also hold their obligations to the community in high esteem, protecting their interests from outside pressures. Hence, the chief did not easily welcome the project when it first came, because he respected that land is the inheritance of families. There is mutual love and support between the community members and their leaders. Even though the literacy rate of the community was low, they valued education and were always eager to learn new things. However, the elderly who uphold cultural practices were sceptical about learned people. They were a spiritual community, believing firmly in their ancestors and God. Communicative learning experiences included concept understanding, progress reporting, community mobilisation, understanding needs and losses, discussion and opinion voicing. Instrumental learning experiences included business skills, financial reporting, operating sprinklers, selection of sugarcane implements, prediction and planning, company registration and writing requests for funding. Perspective transformation experiences were in gender roles, community development projects in general, family interests, work dynamics, agricultural and social norms. Findings revealed knowledge gaps on sustainable practices, debt management, board election procedures and value of collaboration.

## Discussion

Findings of the study are in line with the assertion by Ntseane<sup>26</sup> that Africans believe that their life, learning and



death are connected to their relationship with people and culture. This goes along with the responsibility of uplifting one another and respect for humanity. However, Porsani et al. report that in Mozambique, the local chiefs deliberately neglected the community concerns and teamed up with the project proponents.<sup>3</sup> When the LUSIP Dam project was introduced, the community was sceptical towards it, but there was growing acceptance as project proponents made many promises. The chief stood with his people and guarded their interests. Ntseane<sup>26</sup> urges that in order for transformative learning to be meaningful, the need to harness the inherent community values of responsibility and obligation of local leaders must be emphasised. Skefu<sup>30</sup> highlighted that in Lesotho Highlands Water Project, the absence of project spin-offs resulted in bad feelings about the project, as was the case with the Maphilingo community. Such disappointments changed tradition in this community that valued coming together, cooperating and collaborating.

The CDP for the Chieftdom states that LUSIP had planned to provide the community with basic literacy education in 2022.<sup>31</sup> However, none of the informants reported to have undergone literacy education through the LUSIP. Another problem was that the community did not get many project spin-offs like neighbouring communities. This meant that learning through involvement was minimal for this community. Yet, Gunda et al. note that options for the development of various livelihood options should be equally spread across chieftaincies.<sup>13</sup> Diduck et al. affirm that when participation is meaningful and includes elements necessary for critical education, individual and collective learning outcomes may ensue, some of which may be transformational in nature.<sup>21</sup> This study confirmed this assertion, since informants who were employed in the sugarcane scheme learnt many technical skills. They attested to the fact that they were able to learn because they were involved in the project, confirming the assertion by scholars that community involvement is an enabler for learning.<sup>10,18,21</sup> Members of the sugarcane scheme forged collaborations with companies and individuals that could advise and give technical skills, for instance soliciting agricultural knowledge and financial advice from non-governmental organisations (NGOs), which results in transdisciplinary knowledge.

Informants revealed a need to learn about sustainable ways of harvesting medicinal plants. SWADE had a plan to establish a Community-Based Natural Resource Management Committee (CBNRMC), which would be responsible for sustainable resource use and was scheduled to start operating in 2019.<sup>30</sup> However, by 2020 it had not started operating. Yet, Diduck et al. report that in India, informants who were involved in Natural Resource Management were able to learn a variety of skills including scientific knowledge, technical and ecological knowledge.<sup>21</sup>

Procedural uncertainty was highlighted as an impediment to accessing LUSIP benefits such as water permits for individual farmers. Conversely, Fitzpatrick<sup>28</sup> urged that for any learning to take place, information access, information

management and procedural certainty are factors that determine the scope of learning outcomes. The extent of instrumental learning was limited in Maphilingo chieftdom because of inadequate training and limited community involvement in the project spin-offs, except for the sugarcane scheme and the greenhouse gardens. Trainings were directed at project beneficiaries, whereas informants felt that the trainings should have been more open if they were to benefit a larger portion of the community. Document review suggests that there were government aspirations to conduct meaningful trainings of the community.<sup>30</sup> However, the results of this study revealed that training and community involvement in general was limited to a relatively small number of community members. Some informants seemed to have undergone perspective transformation, as their narratives showed points of convergence with the stages of perspective transformation. While following the steps of transformative learning process, some informants did not specify the frames of reference, assumptions, values and belief systems. They would be implied in context. Diduck et al. confirm that few of the studies on transformative learning reveal details of the critical self-reflection process.<sup>21</sup> Ntseane<sup>26</sup> explains that a contributing factor could be that most adults in different cultural contexts may not be familiar with the concept of transformative learning as was the case with informants from Maphilingo community. Most informants had changed what they believed about LUSIP development when it came. Most expectations they had from the project did not manifest, leading to a new belief that development is all about their loss. This is in line with the observation made by the WCD<sup>18</sup> that equity often speaks more to the vulnerabilities of isolated, less powerful populations for whom 'development' can all too easily mean loss.

## Transdisciplinary nature and contribution

The study adopts the social engagement school of thought for transdisciplinary research. It employs a methodology that embraces the field of developmental issues, the phenomenological field and pedagogy. Rigolot<sup>32</sup> describes transdisciplinarity as a way of being, and propounds that when it is embraced as a way of being, it transcends project boundaries and becomes a continuous presence in everyday life. It brings together the TLT and the WCD<sup>18</sup> Framework to form the conceptual framework, which scholars could use in future transdisciplinary studies. Anthropological insights are provided as the study documents changes in relationships and culture, resulting from the presence of the dam. Multiple data collection tools employed allow a holistic understanding by integrating multiple perspectives. The study offers psychological impact by revealing community anxieties and emotions in response to the dam's social impacts through narratives of their lived experiences. The study is an exploration of the learning of adult, non-academic research participants. Learning approaches are an important aspect of Transdisciplinary (TD) projects, as learning is closely linked with personal experience.

## Strengths and limitations of the study

While social impacts of dams have become a subject of research by a number of authors, research on 'learning from social impacts of dams' is very scanty. Yet 'learning for sustainable development' has emerged as an important topic in environmental literature. Hence, this study adds to the existing literature on this subject.

The study was restricted to only one case in the LUSIP Development Area; therefore, the findings cannot be readily applied to other communities. The study used a non-probability purposive sampling, which meant that some knowledge could not be captured. The researcher's personal epistemology was another restriction of this study, which was overcome by constant bracketing. The large amount of data generated from the study took time to transcribe and analyse, which could have resulted in the omission of valuable information and leads. However, the data generated by the study were relevant for obtaining information about the learning experiences of Maphilingo community from the social impacts of LUSIP Dam.

## Recommendations

The study recommends that SWADE work on the community water scheme and introduce more projects spin-offs in the community, so that community members can have learning experiences through participating in projects. Informants raised equity issues regarding benefit distribution in the LUSIP Project Development Area (PDA). The study recommends that ESWADE should ensure that benefits are equitable, both within the LUSIP PDA and within each chiefdom. A multiple case study of the whole PDA, utilising mixed methods is recommended for future research that aims to compare learning from the social impacts among the chiefdoms. Eswatini Water and Agricultural Development Enterprise should train community members on the project spin-offs, to ensure a smooth continuation when the projects are handed over to the community. Furthermore, training should be inclusive and target all community members, not just the beneficiaries.

## Conclusion

This study reported on community members' learning experiences from their engagement in LUSIP Dam project. Although the informants of this study were only a limited number of the total participants in LUSIP project, they gave valuable information on how the community learnt from their experiences of dam social impacts. This information made it possible, using the TLT, to assess different types of learning, as provided for by the theory. Generally, the community members' learning experiences were limited in the sense that the projects they were engaged in and learning from, were also limited in scope. The community was initially sceptical towards the project as a whole, but acceptance improved as promises of better livelihoods were made. However, as the project failed to improve

livelihoods in the community, they became vulnerable. In such circumstances, it is important to build a close engagement with the community, to ensure equitable and lasting benefits. In this case, the dam proponents need to return to the community and do better. This study also identified specific knowledge gaps within the community. In addition, the study has also demonstrated the value of using TLT for this kind of assessment, highlighting the importance of lifelong learning for the success and failure of development projects.

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## Authors' contributions

D.G.N. contributed to project conception, data collection, draft article and manuscript revision. M.C. contributed to project supervision, draft article and article revision.

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## Data availability

The authors confirm that the data supporting the findings of this study are available within the article.

## Disclaimer

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