



# The Influence of Adaptive Co-management Interrelations on the Social Learning, Change and Transformation of the Pugu and Kazimzumbwi Community in Tanzania

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## *Abstract*

*This study sought to identify signs of social learning, change and transformation resulting from adaptive co-management interrelations in terms of the project 'Reduction of Emission from Deforestation and Forest Degradation' (REDD) at the Pugu and Kazimzumbwi Forest Reserves (PKFR) community in Tanzania. The study therefore presents some enablers and constraints in respect of learning, agency formation, social change and transformation potentially influenced by the REDD. This is a qualitative case study that explored 'learning'<sup>1</sup> from living experiences of local people at the PKFR and from local mechanisms of the REDD project. Reflexive workshop interventions were used to validate the performance of local REDD practices against the adaptive co-management framework. Other data was obtained through interviews, focus-group discussion, the analysis of documents and direct observations.*

*The study found that individual people may deepen their understanding of forestry issues through collaborative interrelations. Social learning in the PKFR community was potentially stimulated by people's relational interactions, reflective thinking and anticipations, and questioning of past practices. Learning occurred subtly, and the learning process was not endured firmly enough to foster the complex learning dynamics necessary for transformational changes. As a result, most of the REDD-stimulated learning did not transform the practices desired in the project.*

Keywords: Social learning, transformations, interrelations, adaptive co-management.

## *Introduction*

The rationale for researching transformative social learning was based on the prominence of Participatory Forest Management (PFM) approaches introduced to the Pugu and Kazimzumbwi community over the past 15 years. Later in 2011, the REDD project was introduced in the community as a new form of PFM in order to focus on community empowerment for transformative adaptation to climate change impacts. The global framework of the REDD project emphasised the assumptions of social learning as ways of achieving social transformation and adaptive practices in climate change-vulnerable communities (Cornell, Berkhout, Tuinstra, Ta'bara, Jager, Chabay & Van Kerkhoff, 2013; IPCC WGII AR5, 2013). The research therefore sought to identify potential conditions of social learning, agency formation, social change and transformation influenced by local practices as a result of the REDD project. This paper draws on a 2012 and 2015 PhD study which investigated the influence of PFM approaches on

transformative social learning at the Pugu and Kazimzumbwi social–ecological community (Ferdinand, 2015).

The paper presents some conclusive results of a one-day reflexive workshop and its interactions by means of which community members shared and examined the learning outputs from previously conducted interviews and group discussions. Workshop members were required to collectively discuss and deliberate on major learning issues before making a conclusive validation of the relevance of REDD practice mechanisms to interrelation standards of adaptive co-management. The output of the validation results expressed indicative conditions for enablers and constraints with respect to learning, agency formation and transformative changes in the community. This paper uses the inductive mode of inference to describe some probabilities of community learning, agency formation and transformative changes in the PKFR context of REDD project frameworks.

### *Social Learning and the REDD Project*

The idea of social learning for progressing transformative adaptations or promoting a change in practices emerged from learning processes that are capable of reorienting people's perspectives towards the intended learning objectives (Mezirow, 2000; Mezirow, 2004; Wals, 2007; Wals, Van der Hoeven & Blanken, 2009; Reed, Evely, Cundill, Fazey, Glass, Laing & Stringer, 2010; Wals & Corcoran, 2012). Social learning is described by Reed *et al.* (2010) as a facilitative process of change in people's understanding, which may also extend to social networks. This research linked social learning with local processes of implementing the REDD pilot project in the Pugu and Kazimzumbwi community in Tanzania, in which collaborative stakeholder engagement was intended to institute structures for governing the reduction of greenhouse-gas emissions (Plummer & Armitage, 2007; Plummer, 2009, 2012; Armitage, 2008; Cundill & Rodela, 2012; Cundill & Fabricius, 2009). Learning through collaborative management of resources is an essential practice of adaptive management as promoted by Pahl-Wostl and Hare (2004), Pahl-Wostl (2006) and Pahl-Wostl, Mostert & Tabara (2008), who extensively researched the management of water resources in Europe. Pahl-Wostl and Hare (2004) describe the important roles of learning and the value of treating learning as an essential element of resource management. This paper also uses some valuable highlights of adaptive co-management from the REDD project framework recently published by the Intergovernmental Panel on Climate Change (IPCC WGII AR5, 2013) and the IPCC (SREX) (2012 reports). The reports also identified social learning as an essential component of adaptive transformations necessary for climate change resilience in African communities.

Assumptions concerning social learning lie in putting people's experiences at the centre stage of social practices (Scott & Gough, 2004; Muro & Jeffrey, 2008), the origin of which can be traced way back to Vygotsky's work in the 1930s (Lotz-Sisitka, Belay & Mukute, 2012; Daniels, 2008). Vygotsky's work emphasised the engagement of learners' consciousness in learning processes so as to stimulate interactive learning experiences. This idea of learning has influenced the field of learning in today's pursuit of environmental education and collaborative resource management (Cundill, Cumming, Biggs & Fabricius, 2011; Lotz-Sisitka, 2012; Lotz-Sisitka

*et al.*, 2012; Lupele & Lotz-Sisitka, 2012; Cundill & Rodela, 2012; Cundill, Schackleton, Sisitka, Ntshundu, Lotz-Sisitka, Kulundu & Hamer, 2014). Some of the learning-focused management approaches are recognised as community-based, participatory and/or social-ecological (Pahl-Wostl & Hare, 2004; Muro & Jeffrey, 2008; Stokols, Lejano & Hipp, 2013). Cornell *et al.* (2013) described the general structure of learning mechanisms in the REDD project as enhancing open knowledge systems in which learning is socially stimulated. This description conveniently bridges the social-learning assumptions discussed earlier in this paper with the open knowledge systems for adaptive management of climate change impacts, as broadly guided by the IPPC (Cornell *et al.*, 2013). It also empowers the objective of this research in order to validate the performance of REDD project practices at Pugu and Kazimzumbwi with regard to participatory frames of adaptive management; hence its relevance to some principles of interrelations reflecting social-learning processes. Already, some scholars have challenged the framing of implementation strategies in most learning-focused management approaches, commenting that these sometimes constrain knowledge up-take and result in defective learning and adaptation (Babikwa, 2004; Jickling, 2004, 2013; Scott & Gough, 2003).

### *Research Design and Methodology*

The first step in designing this research was to keep abreast of ontological and epistemological stances in framing a socially oriented and practice-based learning process; hence the need to clearly define some indicator conditions for identifying the occurrence of learning from local people's experiences. A deeper understanding of what social learning is, and how and why it occurs, was inevitable. As a researcher and learner, I consulted the literature associated with social-learning theories, transformative learning theories, and the theoretical concepts of learning as a process and outcome of social practice. Five indicative conditions for transformative social learning were summarised from the insights gained from the literature. The five indicators of learning were (but not limited to): (a) engagement of people; (b) people's motivation/empowerment; (c) coping with tension; (d) change in people's understanding; and (e) change in practices. These indicators were adopted in this research for the identification of evidence of learning spaces within the locally emerged interrelations of REDD project stakeholders (see Table 1).

Four villages, namely Kisarawe, Maguruwe, Kisanga and Nyeburu (see Figure 1) were actively involved in the research. Figure 1 presents a map of locations and distribution of the four villages around the PKFR. While Kisarawe village is located around the Kisarawe district centre to the north of Kazimzumbwi Forest and south of Pugu Forest, Nyeburu is located in the south-east, and Kisanga and Maguruwe South on the west of the site. The population sizes of the participating villages in terms of household estimates are shown in Table 2.

This research was conducted in the form of a qualitative case study. At the start of the study (2012–2013), I critically analysed archival documents, historical records, and observable features of relevance to PFM implementation at the site. This was done so as to establish baseline information on past, present, and potential future processes of learning from PFM interventions. In-depth interviews were then conducted to explore individuals' experiences of, and perspectives on, local issues of participatory management of forests. The interviews were

**Table 1.** Five indicators of learning and the associated clusters of iterative learning processes

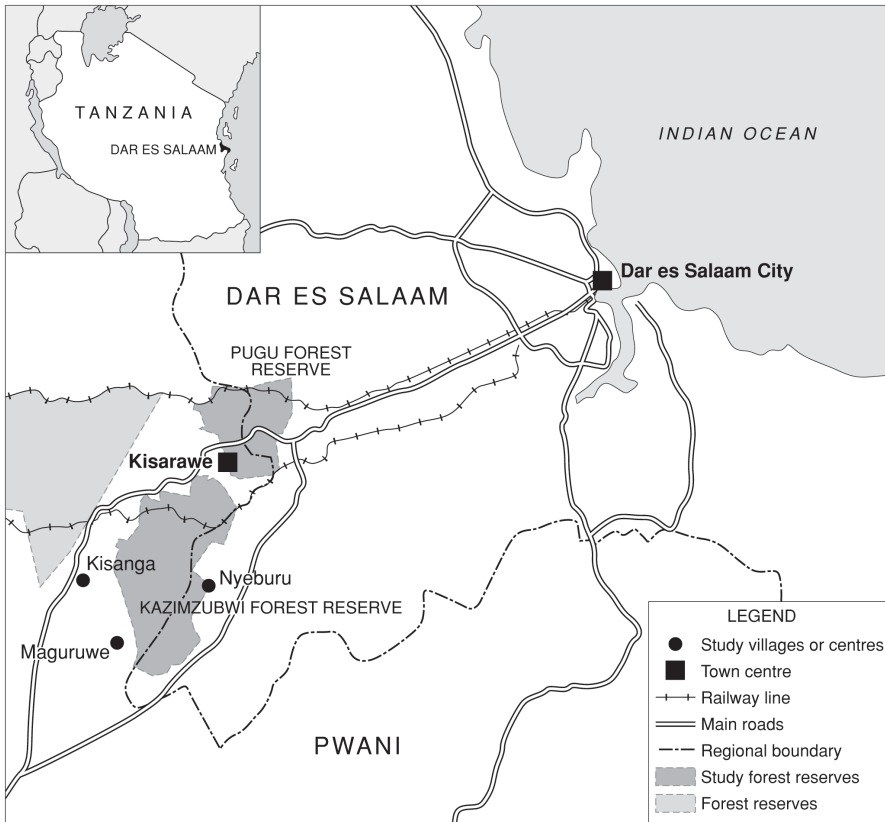
<b>Learning indicator</b>	<b>A cluster of iterative processes that form the indicator</b>
People's engagement	A cluster of iterative learning processes that include communicative discourses, doing tasks, training, implementing new rules, policies and regulations, thinking and talking about project issues, etc. (Mezirow, 2000; Schatzki, 2000, 2001, 2012; Wenger, 1998; Reed <i>et al.</i> , 2010; Kemmis & Mutton, 2012; Cundill <i>et al.</i> , 2014; Kemmis & Mutton, 2014).
Motivation/empowerment	A cluster of iterative learning processes that include people's commitments, inspirations, motivations, praxis, signs of social justice, and emancipation (Mezirow, 2000, 2003, 2004; Wals, 2007; Wenger, 1998; Hargreaves, 2011; Schatzki, 2012; Cundill <i>et al.</i> , 2014; Kemmis <i>et al.</i> , 2014).
Coping with tensions	A cluster of iterative learning processes that include people's flexibility and reflexivity, critical thinking, rationalising, rethinking ideas, creativity, innovations, etc. (Mezirow, 1998, 2009; Dirkx, Mezirow & Cranton, 2006; Archer, 2007, 2010; Wals <i>et al.</i> , 2009; Reed <i>et al.</i> , 2010).
Change in understanding	A cluster of iterative learning processes that may include a combination of any processes that lead to a change in people's understanding at individual and group levels (Mezirow, 2003, 2004; Wals, 2007; Muro & Jeffrey, 2008; Reed <i>et al.</i> , 2010; Hargreaves, 2011; Glass, Scott & Price, 2012; Cundill <i>et al.</i> , 2014).
Change in practices	A learning process that may discursively occur from any of the clusters of iterative learning processes mentioned above. It is an ever-forming and ever-changing product as well as process (Muro & Jeffrey, 2008; Pahl-Wostl <i>et al.</i> , 2008; Hargreaves, 2011; Schatzki, 2012; Kemmis <i>et al.</i> , 2014).

**Table 2.** Population sizes of villages in terms of household estimates

<b>(North-east of Kazimzumbwi Forest)</b>	<b>(Around Kisarawe District centre)</b>	<b>(South-west of Kazimzumbwi Forest)</b>
Nyeburu Street (estimate: 2 500 households by 2012)	Kisarawe Village and subvillages around the district centre (estimate: 2 500 households by 2011)	Kisanga Village (estimate: 478 households by 2012)
Kimwani Street (slightly more households than Nyeburu by 2012)		Maguruwe Village (estimate: 160 households by 2012)

followed by focus-group discussions in the last quarter of 2013 to consolidate major learning issues that had emerged in the community, as perceived by individuals, and kept in the form of PFM records, documents and objects. The focus-group discussions were guided in order to stimulate local perspectives on change in people's practices as the community implemented PFM through REDD project activities. The discussions were also used as platforms for sharing both positive and negative perspectives and opinions of local people about the REDD project activities in the community. Members of the discussion groups were encouraged to make suggestions as to what PFM projects could do, how this could be done and why, with a focus on REDD practice mechanisms. A summary of results from the focus-group discussions is presented in Table 3.

**Figure 1.** Map showing village distribution around the study site (modified from Kashaigili, 2013)



A reflexive workshop involving all individuals who took part in interviews and those who took part in focus-group discussions was later conducted in May 2014. The aim of this workshop was to facilitate an inclusive forum for collaborative sharing and discussion of, and deliberation on, major learning issues arising from interviews and focus-group discussion. Workshop participants learnt and agreed on principal interrelation mechanisms inherent in the adaptive co-management framework established in the works of Cundill and Rodela (2012), Cundill (2010), Cundill *et al.* (2011), Berkes, Colding & Folke (2003), and Pahl-Wostl *et al.* (2008). Five categories of interrelation mechanisms (see Table 4) were used by workshop participants to validate the performance of REDD project practices against the adaptive co-management framework.

Different modes of inference were used to interpret issues emerging at different levels of this study. In analysing the results of focus-group and workshop discussions, an inductive mode of inference was used to draw out learning possibilities and identify conditions that enabled and constrained learning in REDD project implementation (as perceived by local people at the PKFR).

## *Presentation of Results*

This paper reports the results of the focus-group discussions and the deliberations from a reflexive workshop in order to argue the modes of occurrence or learning in PFM projects, with a focus on REDD project practices at the Pugu and Kazimzumbwi site. Table 3 highlights what transpired in the focus-group discussions. Four themes are inductively derived to cover learning issues that were deliberated on in the discussions.

1. Reflections on past experiences of other PFMs and REDDs;
2. REDD approaches in respect of local forest enforcements;
3. Government approaches in respect of local forest enforcements; and
4. Incentive schemes and capacity building with regard to other PFMs and REDDs.

Table 4 presents the results of workshop deliberations. The workshop participants validated the performance of local practices in respect of the REDD project by rating the effectiveness of some events in promoting adaptive, co-management interrelation frameworks.

**Table 3.** Four learning focuses that emerged from focus-group discussions

<b>Reflections of past experiences of the PFM and the REDD</b>	<b>REDD approaches to enforcement in respect of forests</b>
<ul style="list-style-type: none"> <li>• Reflections on past PFM experiences brought back memories of failing to achieve Joint Management Agreements (JMAs).</li> <li>• Reflections also surfaced the difficulties experienced by the community in working with departments of central government.</li> <li>• Reflections explored some factors which resulted in institutional barriers for the district authority in handling JMA issues, as the district authority was not authorised to manage issues relating to the National Forest Reserves.</li> </ul>	<ul style="list-style-type: none"> <li>• The idea of carbon trading through the farming of trees and encouraging regeneration was introduced. An estimated 250 000 trees were planted in the forest reserves.</li> <li>• Fire-control committees were established in order to strengthen the village environmental committees that existed.</li> <li>• District and village authorities were not legally bound by the REDD project. Consequently, there were no memoranda of understanding or legal contracts between district/village governments and the REDD project.</li> </ul>
<b>Government approaches to enforcement in respect of forests</b>	<b>Incentive schemes and capacity-building</b>
<ul style="list-style-type: none"> <li>• Government management structures for governing the work of non-governmental organisations (NGOs) within the PKFR community were weak in ways that created room for NGO workers to carry out their duties without government monitoring.</li> <li>• The capacity of government management structures to control forest encroachments was inadequate.</li> <li>• Government support for locally initiated strategies to enhance forest management was inadequate.</li> </ul>	<ul style="list-style-type: none"> <li>• There were adequate plans for both incentives and training schemes with regard to the PFM and REDD project.</li> <li>• The skills that were acquired by local people from training were not put into practice in the community due to a lack of resources. The certificates offered were therefore worthless.</li> <li>• Financial incentives for local projects were too meagre to ensure sustainability. There was underbudgeting for local activities, whereas NGOs received the lion's share.</li> </ul>

**Table 4.** Table showing the validation of the performance of the REDD project mechanisms against adaptive co-management

No.	Interrelation mechanisms for the adaptive co-management framework	Workshop validation of the performance of the REDD in respect of the interrelation mechanisms
1	Openness of collaboration, networks and information communication	The workshop participants validated the performance of the REDD project with regard to openness of collaboration and networks as low. The project planning was not collaborative enough, since the roles of villages and district governments were not regarded as institutional. Local project mobilisation was done through village leaders, village committees and environmental activists. Village meetings were used to initiate communication in respect of the project agenda, but were not legally part of the project. This tended to obscure lines of communication, collaboration and networking between district/village governments and the rest of the project stakeholder team.
2	Collectiveness in framing of shared objectives and in tenure of resources	The workshop participants validated the performance of the REDD project with regard to collectiveness in the framing and sharing of objectives as low. During the workshop, community members, including village chairpersons, were not aware of the time span of the REDD pilot project, which was five years. This indicates inadequate sharing of project objectives. When the REDD project was terminated in 2013, village governments had not given their consent and did not receive official notification of the termination. Village communities did not know whose interests were served by the termination. The lack of shared strategies in respect of land tenure gave rise to poor resource monitoring, such as a lack of effective by-laws.
3	Willingness to learn from one another, and trust-building among stakeholders	The workshop participants validated the performance of the REDD project regarding willingness to learn and building trust among stakeholders as low. Workshop members said that the community was less confident about project partnerships, since it (the community) did not trust some of the project implementers, including NGOs. The community viewed NGOs as opportunistic, individualistic and malicious. Local people in the community were not sure of the tangible benefits of the project as communities (not as individuals). Experts in different fields covered by the project were not willing to learn from ordinary people who were not educated.
4	Funding of local initiatives and other local incentives	The performance of the REDD project with respect to funding local project initiatives was validated as low, since the budgeted funds for local activities were claimed to be insufficient for community development. The community was not involved in budgeting for local activities, so it was difficult for it to contribute ideas for favourable development. Financial incentives resulting from the project were greatly acknowledged by individuals as producing casual wages from project work, lunch and/or transport allowances, and promised capital for micro-projects. The community wished that the project could pay revenue to village governments, and also proposed this.

No.	Interrelation mechanisms for the adaptive co-management framework	Workshop validation of the performance of the REDD in respect of the interrelation mechanisms
5	Effectiveness of local leadership	The workshop participants validated the performance of village leadership relating to the REDD project as high, and the performance of leadership from other local institutions in the community as low. Leadership at village levels was regarded as effective in communicating project information through organised meetings and village committees. Village chairpersons were seen to be serving the interests of local communities. Leadership from other local institutions, including law enforcers (e.g. the police and magistrates), NGOs and country universities, was regarded by the community as ineffective, as these seemed to lack the willpower to pursue community interests in the course of the project.

## Discussion of Results

### Learning through interrelations

Before discussing the analysis of the results in Table 4, comments on the epistemological and methodological framework used in arriving at the results are given. The workshop, which was participatory, reflexive and collaborative, was, in itself, a version of interrelation space that provided learning opportunities assumed in an adaptive co-management framework. As a researcher engaged in the participatory discussions, I did not just monitor the learning experiences but was also involved as a social learner through my own experiences. This occurred in the course of talking, sharing ideas, and reflecting on my own feelings about forest issues. I inevitably interacted with workshop participants, and responded and (re)acted concerning issues that were raised. Nevertheless, my role of observing, reflecting on, and analysing the learning experiences of individual participants as they were arguing about and discussing forestry matters was maintained throughout. Muro and Jeffrey (2008) suggest that people tend to increase their chances of improving their understanding of things when they participate in collaborative reflection. People may gain clarity on issues as they listen to one another, understand one another's perspectives, and are empowered by having others around them (Muro & Jeffrey, 2008). Box 1 presents some quotes representing the remarks made by workshop participants which revealed improved understanding of forest-management issues through the workshop interactions:

**Quote box 1.** Quotes revealing improved understanding

- We never knew we would be able to recheck the project practices in [the] way you have guided us through this [reflection]. You know what? We had to think critically, face challenges and [use] our brains to come up with results. This is an eye-opener ... we have benefited a lot from this workshop... . This piece of work is really a lesson. I am going to keep this paper ... . *(participant from Kisarawe Village)*



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- Thank you... . I think even the government must be very careful with project implementation. And we will be better informed when new projects come in ... . We were so naïve in most of the past engagements because we did not know it was our right to understand all these things... and to be considered in such [a] front position ... . The workshop has been very enlightening ... . (Participant from Maguruwe Village)

### Social learning analysed from the research results

The explanations in both Table 3 and 4 are indicative of the local potential and possibilities for community learning at the PKFR in terms of the REDD project framework. When people were engaged in reflections on past PFM experiences, learning about the present conditions and the capacities of the REDD project to address the existing PFM gaps in the community was indicated. Kemmis, *et al.* (2014:2) recommends the process of reflecting on past experience as a potential stimulant for social learning: 'It is an achievement secured by human *practice* – the practice by which we secure and stabilise the world of today as continuous with the world of yesterday, and as the precursor of the world of tomorrow' (emphasis in the original). Discussions on the past experiences reflected on by the community were apparently an indicator of the community's potential for social learning and for enhancing the possibility of informed social change.

Furthermore, some moments where learning processes were constrained by gaps that emerged in stakeholder's perspectives were identified from the results. There were, for instance, some constraints in respect of social-relational collaboration among REDD stakeholders, something that the project mechanisms could not address in full. Such constraints could impede the process of social learning that had emerged from community enthusiasm regarding the REDD project. As indicated in Table 3, the community noted that there was some power tension among NGO (non-governmental organisation) workers, government institutions and donor agencies. Table 4 shows that the community was practically unhappy about other stakeholders in the project, especially state actors. The community explained that it did not trust the intentions of these stakeholders in supporting community interests. Such claims may indicate ineffectiveness in dialoguing different group interests, thus limiting the capacity for developing the common objectives of the project. Lack of mechanisms for defining and monitoring each group's interests may clearly hamper collaborative learning in respect of understanding and social support of the project. The results show that the mechanisms for implementing the REDD project in the PKFR were not properly framed so as to mediate emerging learning-tensions across different actors. The REDD project mechanisms lacked an appropriate framework for governing the social-relational feedback that is essential for stabilising the project's ecological

objectives. Feedback such as people's doubts, complaints, diversity of interests, and institutional hegemony influenced by the context could have informed the REDD project practices and facilitated review processes. Such a management cycle is part of the iterative-learning process in ecological management. To support the importance of developing social relations among project stakeholders and reframing institutional structures to support emerging social entities, Pahl-Wostl *et al.* (2008:3) stated:

The problem that we face when we deal with sustainability lies not so much in our lack of understanding of the functioning of ecological systems, but in our lack of understanding of the governance and cultural systems and how they are structured and managed and interact with ecological systems ... Social learning entails developing new relational capacities, both between social agents, in the form of learning how to collaborate and understand others' roles and capacities differently, and also between social-ecological systems (sustainability learning). New institutional arrangements are needed to structure the more sustainable relationships, based on new framings of the issues at stake and the agents involved.

These findings are also supported by Hart (2004), who suggested a dialectic debate (about resource-management systems) that balances out ecological demands from challenges of social demands. The dialectical debate may emerge between the project's ecological perspectives and change perspectives. Issues of social relations in the REDD project at the PKFR were, for instance, part of the natural debate in support of ecological reduction of greenhouse gases through a multistakeholder framework as part of the REDD project. Projects such as the REDD could be reviewed/redesigned to address drivers of social change (the people's agency for making change happen) of equal importance as people progress ecological motives (what they want to change in the ecology). According to Hart (2004), consciousness in mediating social relations could potentially open possibilities for adjustments and re-theorisation of project plans. As found in the research (Ferdinand, 2015), the forest-governance structures of the REDD project in the PKFR failed to support the social and relational challenges emerging from integrative social-cultural systems and the learning mediatory conditions necessary for ecological management.

### **Agency formation, social change and transformation**

By virtue of its iterative and generative ontology, social learning is an ever-emerging process. The learning process may gradually and constantly reorient people's ways of thinking about and viewing things as they engage in ecological activities and in developing new social relations. Both Table 3 and 4 show some potential for the reformation and reshaping of local agency. Table 3, for instance, expresses changes in people's experiences as they are learnt by living in the older ways of PFM projects, in contrast to the PFM currently introduced by the REDD project. Evidence of changes in people's experiences suggests the occurrence of subtle changes in their understanding of things and social practices. Active engagement in thinking about, and rethinking, issues for coping with project challenges (Table 3 and 4) has demonstrated varying

levels in the formation of local agency for learning and social change, as described by Eteläpelto, Vähäsantanen, Hökkä & Paloniemi (2013). Different levels of agency formation may, according to Eteläpelto *et al.* (2013), develop from collective, or an individual's, participation in a working community. These authors describe this as 'life course agency' in which people plan their lives and strive to make the right choices for their own well-being and self-fulfillments (Eteläpelto *et al.*, 2013:46–47).

The main challenge in agency formation was identified by Lotz-Sisitka *et al.* (2012) as how acquired agency may orient towards desired changes, as this cannot be a predetermined process, but must emerge as individuals and communities make choices and decisions in relation to the histories, cultures, and structural conditions and contexts in which they find themselves. While trying to address this challenge, the agency formed by the PFM and REDD project interventions in the Pugu and Kazimzumbwi community could not achieve the ultimate goals of the projects. It seemed difficult for the PFM and the REDD projects to manage social changes and to take charge in controlling conditions that improvised significant impacts in changes of local agency. Kemmis *et al.* (2014) examined the challenges of managing changes in social practices and advised change managers to stay focused by ensuring sustainability in conditions that cause and support change. The critical need for sustaining conditions for change is supported by claims from interview data, as quoted in Box 2 below:

**Quote Box 2.** Quotes from interviews showing unconsolidated learning processes in both the PFM and REDD

If there is any chance of changing ... what's your suggestion?

**Participant from Kisarawe Village:** I think if people [are] engaged deeply enough to be able to really see the impact of changes [and] the benefits, and [are] able to sustain [these] in life ... , [they] could change. People want to see surprising success ... and be able to wow [applaud] [it]... . "Aha! So it truly works!" People want to see the 'fruits'.

**Participant from Nyeburu Village:** There is a need to have a better and truly sustained relationship between forest authorities and the community. If the forest authority takes this relationship serious[ly], people will see the value of [protecting] forest reserves. Outsiders [will, therefore,] not have the chance to invade local forest areas.

**Participant from Nyeburu Village:** There must be a connection between what we did in [the] PFM and what [the] REDD is doing now. They must involve us. The new forest committees must involve the older members of PFM committees. They must know what we [have done], and how we did it.

**Participant from Kisanga Village:** In terms of environmental awareness, we have had enough. We have enough forest[ry] education in our village. Now we want the government to let us own the forest reserves and [it] will see the outcomes. The government has failed to manage forest reserves, [but] we can do it. You will see changes.

The quotes in Box 2 may explain how much learning had occurred among local people during the PFM and REDD projects at Pugu and Kazimzumbwi. The quotes, however, indicate that the change managers (in the PFM and REDD projects) were not able to coordinate the learning that had occurred and the significant changes for transforming people's social lives and practices. As advised by Kemmis *et al.* (2014), the best turning point for transforming social practices in communities could be based on addressing the existing material conditions of the projects, social-cultural systems and interrelations that impede desired changes, so that more desirable changes have the space to emerge from existing contexts and practices. The quotes from the interviews have expressed the need for enduring change systems for any significant transformation to occur. This apparently remained unheeded in the PFM and REDD projects in the Pugu and Kazimzumbwi community. The first column of Table 3, for instance, expresses the limitations of the PFM projects to endure learning challenges for achieving Joint Management Agreements (JMAs). Similarly, Table 4 shows a one-year-long challenge of enduring social-learning processes in REDD project mechanisms for which the conditions for change and transformation were not sustained. In short, apart from evidence of subtle learning and the occasional building of agency, there was no substantive evidence to claim sustainable change and social transformation resulting from the REDD and PFM initiatives.

### **Transformational adaptation to climate change**

The notion of transformational adaptation as a measure of mitigating the impacts of climate change and other environmental challenges was recently proposed by O'Brien and Sygna (2013), and Jones and Carabine (2013). Among writers on education for sustainability, Wals and Corcoran (2012) and Smith (2008) also made the same proposal. All frameworks for transformational adaptation to climate-change challenges were apparently proposed to emphasise integration of social-cultural conditions in resource management systems. The National Adaptation Programme of Action (2007) in Tanzania has, for instance, outlined several adaptation actions to potentially address the sectoral challenges of environmental sustainability in the country. The forestry industry is one of the prioritised sectors in which the need for collaborative community learning was proposed for re-correction, the improvement of coping strategies, and the transformation of new practices. Other adaptive techniques in community-based forest management were proposed through monitoring of habitat destruction, promoting alternative-energy technologies, as well as enhancing collaboration and community participation. To better achieve the identified strategies, actions and techniques, the National Adaptation Programme of Action may also need to engage a critical focus on the social-learning agenda for and reflexive drivers of transformational changes. However, some popular community-based programmes in the country may continue to report the usual success stories without reflection on achieved learning, change and transformation, thus glossing over the deep-seated, more sustained and meaningful change needs of communities as expressed by themselves, as was the case in this research (Ferdinand, 2015).

## *Conclusion*

In conclusion, the research focused on the PFM and REDD project within the Pugu and Kazimzumbwi community in order to highlight the influence of globally introduced management frameworks and their local implementation strategies for stimulating learning. This paper has presented some evidence to show the role of social interrelations in social–ecological management for promoting collaborative learning and enhancing possibilities for change and the transformation of practices. The paper specifically describes ways in which interrelational spaces can be created and sustained so as to fulfil learning objectives and endure desired levels of change in agency and social transformation. Further, the paper has demonstrated some enabling and constraining conditions for learning in respect of forestry practices and has shown how both conditions emanate from institutional support and governance mechanisms improvised by forest-management systems.

This research made use of local people's voices to determine REDD support mechanisms for the learning of forestry practices by the community. The findings of this research were obtained from an in-depth analysis of the evidence on learning as seen through local people's perspectives in the Pugu and Kazimzumbwi community. Local people's perspectives are normally underrepresented in most stages of project development, including planning, monitoring and evaluation. This diminishes the autonomy of local actors in valuing and validating the roles of other actors and, apparently, their own roles in participatory partnership projects, and thus also in the change processes.

## *Endnote*

1. The term 'learning' as used in this study may reflect an overall process of iterative, socially emerging change in people's understanding that initiates a change in local agency and social transformation.

## *Note on the Contributor*

Victoria Ugulumu Ferdinand was a PhD fellow at Environmental Learning Research Centre at Rhodes University South Africa and has since obtained her doctorate. Before embarking on her PhD research on Transformative Social learning, she worked with the Wildlife Conservation Society of Tanzania (WCST) as a specialist in Environmental Learning and Awareness.

## *References*

- Archer, M.S. (2007). *Making our way through the world. Human reflexivity and social mobility*. Cambridge, UK: Cambridge University Press.
- Archer, M.S. (Ed). (2010). *Conversations about reflexivity. Ontological exploration*. London: Routledge.
- Armitage, D. (2008). Governance and the commons in a multi-level world. *International Journal of the Commons*, 2(1), 7–32.

- Babikwa, D.J. (2004). Tensions, contradictions and inconsistencies in community-based environmental education programme: The role of defective education theories. *Southern African Journal of Environmental Education*, 21, 61–80.
- Berkes F., Colding, J. & Folke, C. (2003). *Navigating social-ecological systems: Building resilience for complexity and change*. Cambridge, UK: Cambridge University Press.
- Cornell, S., Berkhout, F., Tuinstra, W., Ta'bara, D., Jager, J., Chabay, I., ... Van Kerkhoff, L. (2013). Opening up knowledge systems for better responses to global environmental change. *Environmental Science & Policy*, 28, 60–70.
- Cundill, G. (2010). Monitoring social learning processes in adaptive co-management: Three case studies from South Africa. *Ecology and Society* 15(3), 28. At: <http://www.ecologyandsociety.org/vol15/iss3/mt28/>.
- Cundill, G., Cumming, G.S., Biggs, D. & Fabricius, C. (2011). Soft system thinking and social learning for adaptive management. *Conservation Biology*, 26.1 (Feb. 2012), 13.
- Cundill, G. & Fabricius, C. (2009). Monitoring in adaptive co-management: Toward a learning based approach. *Journal of Environmental Management*, 90, 3205–3211.
- Cundill, G. & Rodela, R. (2012). *A search for coherence: Social learning in natural resources management*. In: Lotz-Sisitka, H.B. (Ed), *(Re) Views of the social learning literature: A monograph for social learning researchers in natural resources management and environmental education*. Howick: SADC REEP/EEASA/Rhodes University.
- Cundill, G., Schackleton, S., Sisitka, L., Ntshundu, M., Lotz-Sisitka, H.B., Kulundu, L. & Hamer, N. (2014). *Social learning for adaptation: A descriptive handbook for practitioners and action researchers*. IDRC/Rhodes University/Ruliv.
- Daniels, H. (2008). *Vygotsky and research*. New York: Routledge.
- Dirkx, J.M., Mezirow, J. & Cranton, P. (2006). Musings and reflections on the meaning, context, and process of transformative learning: A dialogue between John M. Dirkx and Jack Mezirow. *Journal of Transformative Education*, 4, 123.
- Eteläpelto, A., Vähäsantanen, K., Hökkä, P. & Paloniemi, S. (2013) What is agency? Conceptualizing professional agency at work. *Educational Research Review Journal*. At: [homepage:www.elsevier.com/locate/EDUREV](http://www.elsevier.com/locate/EDUREV).
- Ferdinand, V.U. (2015). The influence of introduced forest management practices on Transformative Social Learning in a selected social-ecological forest community. A case of PFM and REDD projects at Pugu and Kazimzumbwi Forest Reserves in Tanzania. *Unpublished thesis for degree of Doctor of Philosophy of Rhodes University, South Africa*
- Glass J.H., Scott, A. & Price, M.F. (2012). Getting at the interface: How can sustainability research stimulate social learning? In: Wals, A.E.J. & Corcoran, P.B. (Eds), *Learning for sustainability in times of accelerating change*. Wageningen: Wageningen Academic Publishers.
- Hargreaves, T. (2011). Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *Journal of Consumer Culture*, 11(1), 79–99.
- Hart, P. (2004). Framing changes as a dialectic: Direction only matters if you know where you want to go. In: Scott, W. & Gough, S. (Eds), *Key issues in sustainable development and learning. A critical review*. London: Routledge Falmer.

- IPCC (SREX). (2012). Managing the risks of extreme events and disasters to advance climate change adaptation. Special report of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University Press.
- IPCC WGII AR5. (2013). Climate-resilient pathways: Adaptation, mitigation, and sustainable development. Chapter 20, final draft.
- Jickling, B. (2004). *Why I don't what my children educated for sustainable development*. In: Scott, W. & Gough, S., *Key issues in sustainable development and learning. A critical review*. RoutledgeFalmer.
- Jickling, B. (2013). *Normalizing catastrophe: An educational response*. *Environmental Education Research*, 19(2), 161–176. At: <http://dx.doi.org/10.1080/13504622.2012.721114>.
- Jones, L. & Carabine, E. (2013). Exploring the political and socioeconomic drives for transformational climate policy. Early insights from the design of Ethiopia's climate resilience green economy strategy. *Journal of Critical Realism*, 6(2), 226–249.
- Kashaigili, J.J., Mdemu, M.V., Nduganda, A.R. & Mbilinyi, B.P. (2013). Integrated assessment of forest cover change and above-ground carbon stock in Pugu and Kazimzumbwi forest reserves, Tanzania. *Advances in remote sensing*, 2013, 2, 1–9. At: <http://www.sciarp.org/journal/ars>).
- Kemmis, S. & Mutton, R. (2012). Education for sustainability (EfS): Practice and practice architectures. *Journal of Environmental Education Research*, 18(2), 187–207.
- Kemmis, S., Wilkinson, J., Edward-Grove, C., Hardy, I., Grootenboer, P. & Bristol, L. (2014). *Changing practices, changing education*. Singapore: Springer Science & Business Media.
- Lotz-Sisitka, H.B. (2012). Learning, agency and social change. Uncovering meaning making in transdisciplinary sustainable development practices. Keynote speaker – Conference UMEA, Sweden, October 2012.
- Lotz-Sisitka, H.B., Belay, M. & Mukute, M. (2012). The 'social' and 'learning' in social learning research: Avoiding ontological collapse with antecedent literatures as starting points for research. In: Lotz-Sisitka, H.B. (Ed), *(Re) Views on social learning: A monograph for social learning researchers in natural resource management and environmental education*. Grahamstown/Howick: ELRC/Rhodes University/SADC REEP.
- Lupele, J. & Lotz-Sisitka, H.B. (2012). *Learning today for tomorrow. Sustainable development learning progress in sub-Saharan Africa*. Hawick: SADC REEP.
- Maxwell, A.M. (2012). *A realist approach to qualitative research*. California: Sage.
- Mezirow, J. (1998). Transformative theory – postmodern issues. At: D:\Literature Reviews\ Transformative learning\Mezirow (1918).mht.
- Mezirow, J. (2000). Learning to think like an adult: Core concepts of transformative theory. In Mezirow, J. & Associates (2000) *Learning as Transformation. Critical Perspectives on a Theory in progress*. San Francisco, Jossey-Bass.
- Mezirow, J. (2003). Transformative learning as discourse. *Journal of Transformative Education*, 1, 58. At: <http://jtd.sagepub.com/content/1/1/58>.
- Mezirow, J. (2004). Forum comment on Sharan Merriam's 'The role of cognitive development in Mezirow's transformational learning theory'. *Adult Education Quarterly*, 55, 69. At: <http://aeq.sagepub.com/content/55/1/69>.

- Mezirow, J. (2009). *An overview of transformative learning*. In: Illeris, K. (Ed), *Learning theorists ... in their own words*. London: Routledge.
- Muro, M. & Jeffrey, P. (2008). A critical review of the theory and application of social learning in participatory natural resource management processes. *Journal of Environmental Planning and Management*, 51(3), 325–344.
- O'Brien, K. & Sygna, L. (2013). Responding to climate change: The three spheres of transformation. In: *Proceedings of Transformation in a Changing Climate*, 19–21 June, University of Oslo, Norway.
- Pahl-Wostl, C. (2006). Adaptive management and social learning: The need for a transition in water management and governance. PowerPoint presentation, World Water Forum, Mexico, March 2006.
- Pahl-Wostl, C. & Hare, M. (2004). Processes of social learning in integrated resources management. *Journal of Community & Applied Social Psychology*, 14, 193–206.
- Pahl-Wostl, C., Mostert, E. & Tabara, D. (2008). Growing importance of social learning in water resources and management and sustainability science. *Ecology and Society*, 13(1), 24.
- Plummer, R. (2009). The adaptive co-management process: An initial synthesis of representative models and influential variables. *Ecology and Society*, 14(2), 24.
- Plummer, R. (2012). Fostering governance and building capacity for climate change adaptation: Can adaptive co-management help? At: <http://www.adaptgov.com/wp-content/uploads/2012/03/Plununer-Keynoteadaptgov.pdf>, visited 18 May 2013.
- Plummer, R. & Armitage, D.R. (2007). Charting the new territory of adaptive co-management: A Delphi study. *Ecology and Society*, 12(2), 10.
- Reed, M.S., Evely, A.C., Cundill, G., Fazey, I., Glass, J., Laing, A., ... & Stringer, L.C. (2010). What is social learning? *Ecology and Society*, 15(4).
- Schatzki, T.R. (2001). Introduction: Practice theory. In: Schatzki, T.R., Knorr, C.K. & Savigny, E (Eds), *The practice turn in contemporary theory*. London: Routledge.
- Schatzki, T.R. (2000). Wittgenstein and the social context of an individual life. *History of the Human Science*, 13(1). Sage.
- Schatzki, T.R. (2012). A primer on practices. Theory and research. In: Higgs *et al.* (Eds), *Practice-based education: perspectives and strategies*. Rotterdam: Sense Publishers.
- Scott, W. & Gough, S. (2003). *Sustainable development and learning – framing the issues*. London: Routledge Falmer.
- Scott, W. & Gough, S. (2004). *Key issues in sustainability development and learning. A critical review*. London: RoutledgeFalmer.
- Smith, T.L. (2008). Researching the natives in the age of uncertainty. In: Denzin, N. & Lincoln, Y. (Eds), *The landscape of qualitative research*. New York: Sage.
- Stokols, D., Lejano, R.P & Hipp, J. (2013). Enhancing the resilience of human–environment systems: A social-ecological perspective. *Ecology and Society*, 18(1), 7. At: <http://dx.doi.org/10.5751/ES-05301-180107>.
- United Republic of Tanzania. (2007). *The National Adaptation Programme for Action (NAPA)*. Vice-President's Office. Dar es Salaam: Government Publisher.



- Wals, A.E.J. (Ed.). (2007). *Social learning: Towards a sustainable world*. Wageningen: Wageningen Academic Publishers.
- Wals, A.E.J. & Corcoran, P.B. (2012). *Learning for sustainability in times of accelerating change*. Wageningen: Wageningen Academic Publishers.
- Wals, A.E.J., Van der Hoeven, N. & Blanken, H. (2009). *The acoustics of social learning. Designing learning processes that contribute to a more sustainable world*. Wageningen: Wageningen Academic Publishers.
- Wenger, E. (1998). *Communities of practices: Learning, meaning and identity*. Cambridge, UK: Cambridge University Press.