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Learning about sustainability and gender through Farmer Field Schools in the Taita Hills, Kenya

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ABSTRACT

This research uses transformative learning theory to explore how Farmers Field Schools (FFS) of the Taita Hills, Kenya have contributed to environmental sustainability, with a particular focus on gendered learning. Both genders experienced transformations in their meaning schemes related to farming (e.g., men and women switched their traditional roles in tillage and planting). A significant change in meaning perspective occurred among men who overcame personal biases and a cultural practice of land inheritance for males to now include their daughters. More research is needed to explore how all participants (farmers, extension agents, scientists) could enhance sustainability efforts and gender equality through agricultural participatory education projects such as FFS.

1. Introduction

Agricultural extension provides services, including inputs and credit, that are intended to help farmers improve their ability to grow crops and make a living. Until the 1990s, extension in Sub-Saharan Africa (SSA) focused on the "transfer of technologies" approach and involved, for the most part, male farmers (Chambers, 1997; Defoer, 2002). The focus of this effort was on technologies developed in research stations under controlled and uniform conditions. However, these technologies were often found to be unsuitable in the complex, diverse and risk-prone lands of SSA (Berg and Jiggins, 2007; Chambers, 1997; Deugd et al., 1998; Percy, 1999a,b; Pretty, 2002; Tittonell et al., 2005a,b).

The diversity of micro-climates, soils and agricultural enterprises, the limited ability of small landholders to purchase inputs, their isolation from the markets (Defoer, 2002; Tittonell et al., 2005a,b), the increased degree of uncertainty in crop production with climate variability, and the mismanagement of depleting water and soil resources all constrain food production for small landowners and negatively impact the "transfer of technologies" approach (Berg and Jiggins, 2007; Defoer, 2002; Percy, 2005; Rockstrom et al., 2003; Rolling and Wagemakers, 1998). Social factors such as health, HIV/AIDs among farm families; gender inequalities regarding land tenure, equitable distribution of labour, and decisions about credit and inputs; as well as youth and male out-migration (Aliber and Walker, 2006; Budlender and Alma, 2011; Francis and Amuyunzu-Nyamongo, 2008; Miller et al., 2010; Yngstrom, 2002), further restrict the application of universal technological fixes for increasing small farm production, including those of the "green revolution".

These complexities created the need for investment in knowledge generation and creativity for overcoming the social limitations to farming. The response to both of these challenges has been a focus on collaborative learning and social action for change. This kind of agricultural extension, termed Participatory Research and Extension (PR&E), is farmer centered, in that farmers participate in and have much greater say over the type of research and extension that will benefit them (Percy, 2005). It essentially changes the interrelationships among scientists, farmers and extension agents. However, despite the promise of PR&E, its contribution to women centered learning outcomes is not clear (Duveskog et al., 2011; Fliert and Braun, 2002).

In fact, most of the reported research on social issues in PR&E is focused on collective access to markets and farmers' political power in local agriculture (e.g., Berg and Jiggins, 2007; Duveskog, 2006; Duveskog and Friis-Hansen, 2009; Fliert et al., 2007). The reality still seems to be that gender remains largely missing from PR&E theoretical and applied assessment literature and when present, for the most part, focuses on the technical skills provided to women rather than on their changing role in key farming decisions such as farm labour and land access (Due et al., 1997;

Abbreviations: AESA, agro ecosystem analysis; FAO, Food and Agriculture Organization; FFS, Farmer Field School; KARI, Kenya Agriculture Research Institute; PRA, Participatory Rural Appraisal; PR&E, Participatory Research and Extension; PTD, Participatory Technology Development; RFM, Resource Flow Maps; SSA, Sub Saharan Africa; TL, Transformative Learning.

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Percy, 1999a). One way for realizing gender equality in PR&E is through a sustained focus on learning that leads to social action and change across scales (extension agents, scientists, policy makers and local people), rather than learning that is based only on transfer of information (Cornwall et al., 2007). For example, Friis-Hansen et al. (2012) found that the involvement of men in gender mixed Farmer Field Schools (FFS) led to better quality of life for their respective wives in the household. These wives' workloads decreased as their husbands participated in labour related to farming and household chores, and the wives gained greater respect and freedom from the husbands.

The FFS readily demonstrate the PR&E approach, particularly related to learning leading to social action outcomes (Birner et al., 2009; Braun et al., 2006). FFS were founded by the Food and Agriculture Organization (FAO) in Indonesia in 1989 for promoting the adoption of integrated pest management as a response to a plant hopper infestation in rice (Berg and Jiggins, 2007; Fliert et al., 2007). With remarkable success in increasing yields and reducing pesticide dependency, FFS spread as a regional "Integrated Pest Management" program for other crops and to other parts of Southeast Asia (Fliert et al., 2007; Palis, 2006). From there, the approach spread to other parts of the world, reaching Africa in 1995. By 2007, some 3000 FFS were established in SSA (Bunyatta et al., 2006; Berg and Jiggins, 2007; Duveskog, 2006; Friis-Hansen et al., 2012).

The purpose of our research was to examine the individual and collective learning outcomes of FFS participants to determine if this learning has led to action aimed at more sustainable farming practices. The focus is on learning outcomes that can create lasting change, resulting in more environmentally friendly, gender equitable agricultural production and therefore a more sustainable community. Since FFS participants in Kenya often include women and men, we also considered gendered learning outcomes. We apply the lens of transformative learning theory to identified learning outcomes for analysis.

The paper begins with a brief synopsis of transformative learning and its relationship to PR&E, and an overview of FFS in Kenya. The case study and its methods are then introduced, followed by a discussion of findings and conclusions.

2. Transformative learning

Transformative learning (TL) is a comprehensive theory about how adults learn. It focuses on learning that transforms problematic frames of reference, or worldviews, hindered by cultural norms and personal biases, into ones which are more informed as a guide for action (Mezirow, 1991, 2000). Influenced by Habermas' theory on communicative action and Friere's concept of conscientization, the theory places a pivotal focus on dialogue and reflection. The dialogue is not any kind of dialogue, it is rational discourse: "...that special kind of dialogue in which we focus on content and attempt to justify beliefs by giving and defending reasons and by examining the evidence for and against competing viewpoints..." (Mezirow, 1994, p. 225). Reflection involves becoming aware of oppressive structures that have hindered one's life and taking action to overcome them. All this takes place in the context of the ideal learning conditions, which are based on Habermas' conditions for rational discourse. Note that these learning conditions are not applicable only in dialogical contexts. For example, Sinclair and Diduck (2001) operationalize the ideal learning conditions in the context of environmental impact assessment. The ideal learning conditions include the provision of accurate and complete information, freedom from coercion, openness to others' points of view, an equal opportunity to participate in various roles of discourse and willingness to seek agreement (Mezirow, 1994, 2000).

The theory differentiates two kinds of learning: instrumental and communicative. Instrumental learning is about learning to control and change one's environment such as learning how to successfully achieve desired ends (e.g., how to negotiate legal and administrative procedures regarding decision processes). Communicative learning involves trying to understand others and be understood when communicating with them, and it engages the learner in negotiating meanings, intentions and values (e.g., resource conflict resolution). Communicative learning involves abstract conceptualization (i.e., negotiating meaning, values and ideals), while instrumental learning involves experiential or empirical methods (i.e., derived from experimentation and observation). Transformative learning is about how we learn to negotiate and act on our purposes, beliefs and values instead of acting on those of others or those that we have mindlessly assimilated. It is about gaining a sense of agency, greater autonomy and becoming more socially responsible, clear decision makers (Mezirow, 1991, 2000).

The parallels between PR&E and transformative learning are remarkable and expansive as others have noted (e.g., Duveskog and Friis-Hansen, 2009; Percy, 2005; Taylor, 2007). Similar to transformative learning, PR&E entails communicative learning through activities which include an emphasis on partnership, collaboration, dialogue, social and co-learning, conflict management and reaching consensus. Learning in the biophysical domain about farming practices and developing site specific technologies (i.e., instrumental learning) is integral to PR&E. In addition, PR&E focuses on constructive dialogue that requires critical thinking and an awareness of context, which parallels the reflection and rational discourse in transformative learning. In the case of PR&E, this constructive dialogue is essential as the research team, including farmers, tries various experiments, discusses the outcomes and incorporates these discussions and outcomes into practice and experimentation on an ongoing basis (Percy, 2005).

Mezirow (1991, 2000) also contends that a disorienting dilemma – for example, a personal life crisis or series of smaller issues (such as learning in either of the instrumental or communicative domains) – catalyzes a transformative experience, or a paradigmatic change. Percy (2005) notes that farmers can no longer farm as they have in the past. The disorienting presence of climate variability, drought, low soil fertility and low productivity in general could potentially lead to a transformative experience. Additionally, Percy (2005) argues that transformative learning is insightful for understanding the pragmatic shift faced by scientists and extensionists from being experts to being learners and facilitators of knowledge and belief in farmers' capacity to innovate. This entails a pragmatic shift for farmers as well (Taylor, 2007). In addition, the rich context of crises in SSA agriculture described earlier further points to a necessary paradigmatic shift in behaviour for scientists, extensionists and farmers (Percy, 2005; Rolling and Wagemakers, 1998).

Transformative learning theory provides a strong framework, including learning conditions and processes, for facilitating these changes (Percy, 2005). Despite the similarities between goals and conditions of both TL and PR&E, limited research has tried to empirically understand the transformative potential of PR&E extension (Duveskog et al., 2011; Duveskog and Friis-Hansen, 2009). The PR&E context also provides a valuable opportunity for understanding learning occurring beyond the individual to the collective level (Percy, 2005), which is often identified as a research gap between the theory and application of transformative learning (Taylor, 1998, 2000, 2007).

Researchers have started exploring transformative learning in a group and non-formal educational context. Easton et al. (2009) for example, argue that in African cultures behavioural changes, even personal ones, are based on collective decisions. They assert that