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Research paper

# Scaling up of sweetpotato vine multiplication technologies in Phalombe and Chikwawa districts in Malawi: A gender analysis

Netsayi N. Mudege[a,*], Robert O.M. Mwanga[b], Norita Mdege[c], Tafadzwa Chevo[d], Putri E. Abidin[e]

[a] International Potato Center (SSA, Nairobi), Kenya
[b] International Potato Center (SSA, Uganda), Uganda
[c] University of Capetown, South Africa
[d] University of Zimbabwe, Zimbabwe
[e] International Potato Center (SSA, Ghana), Ghana

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ABSTRACT

This paper adopts a feminist approach to analyse how processes of scaling up of technologies to promote adoption can reinforce or reduce gender inequalities. It focuses on sweetpotato vine multiplication in Phalombe and Chikwawa districts in Malawi, and uses data from focus group discussions and individual interviews with men and women farmers and extension workers. Findings suggest that perception biases towards regarding the farmer as male results in women being overlooked in training, as well as the devaluation of women's knowledge, which jeopardises their ability to adopt new sweetpotato technologies that are being scaled up/ rolled out. Technologies are often rolled out within institutional contexts where women are in positions subordinate to men, resulting in women not being able to fully and independently adopt them. Sweetpotato technology choices are also influenced by access to resources such as land, irrigation systems and labour. Women often lack these. Sweetpotato vine multiplication may increase women's workload leading women to dis-adopt. The implications of this research are that scaling up strategies to promote technology adoption by women should go beyond the technology itself to restructuring both the technical and nontechnical aspects of agriculture so that women can fully benefit from improved technologies. From this perspective the physical and institutional context in which the technology is implemented has to be understood and any necessary adjustment made to ensure that both men and women adopt the technology and benefit from it.

## 1. Introduction

Agriculture in Sub-Sahara Africa (SSA) has been beset by problems related to underperformance in the sector. To some extent, this has been linked to lack of appropriate technologies as well as low adoption rates of improved technologies. Adoption of improved technologies such as improved crop varieties, improved crop management systems, and labour saving technologies are often regarded as important to improve productivity, farmer welfare and livelihoods (Awotide et al., 2013). It has been noted, however, that although in general there is low technology adoption rates in SSA, women have lower adoption rates compared to men (Doss, 2001; Ragasa 2012).

The lower rates of technology adoption by women is often linked to gender inequalities where women do not have access to resources, technological or otherwise. These gender inequalities may lead to different abilities and willingness of men and women to adopt certain technologies. From this perspective, underperformance of the agriculture sector is then linked to gender inequalities in "access to and control over resource and opportunity" (Beuchelt, 2016:182), which constrain women from adopting and benefiting from new improved technologies.

There has been a concerted effort to promote women's adoption under the assumption that increased women's adoption will also increase agriculture efficiency. However, there have been limited analysis of the implications of the processes through which technology is rolled-out. Using a case study from Malawi, this paper seeks to contribute to literature by showing how processes of scaling up of technologies to promote adoption can reinforce or reduce gender inequalities. Of particular interest is how social, technological and institutional environments interact to create opportunities and obstacles for men and women in the adoption of orange fleshed sweetpotato vines and vine multiplication technologies.

One of the key weaknesses that has been noted in the promotion of agriculture technologies is the unquestioning assumption that if

* Corresponding author at: International Potato Center, Sub-Sahara Africa Regional Office, ILRI Campus-Old Naivasha Road, P.O Box 25171-00603, Nairobi, Kenya.
*E-mail address:* n.mudege@cgiar.org (N.N. Mudege).

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technologies target male household heads, other members of the households including women will also benefit (Beuchelt, 2016). Kingiri (2010) noted that in farming systems, generally, research and innovation, unequal relationships between men and women in households are taken for granted (Kingiri, 2010). This impacts a variety of social relations. For example, development of new technologies and their scaling up processes may end up benefiting men more than women. Furthermore, men and women may suffer from different vulnerabilities because they play different roles within agricultural systems, occupy different socio-economic positions linked to these roles, and may farm different crops or the same crops for different reasons. (Carr, 2008). All these factors can affect their willingness and ability to adopt new technologies.

The two technologies to be discussed in this paper: 1) orange sweetpotato varieties and; 2) sweetpotato vine multiplication systems, can be regarded as 'soft' technologies (Altieri, 1995). The UNFCCC (2014) states that there are three different kinds of technologies: 1) hardware, which denotes the physical tools; 2) software, which often refer to the techniques, skills and processes to use the technology; 3) orgware, which focuses on institutional arrangements around the technology. We adopt the scaling up definition by Coe et al., 2014: 73) which 'research being done to identify possible improvements to agricultural practice, testing and refining these interventions in pilot locations, and then widely disseminating the refined interventions'. Scaling up also has an element of adoption of these practices and technologies by a large number of farmers beyond the pilot villages.

## 2. Methodology

This paper borrows from feminist approaches to understanding gender and technology adoption. Feminist approaches regard "gender and technology as socially shaped and so potentially reshapable" (Faulkner, 2001:80). They emphasise "the way in which gender power relations [are] deeply embedded…in science and technology" (Wajcman, 2007: 290). It is suggested that, "the co-production of gender and technology does not end with the innovation and design process," (Wajcman, 2007:293). We should therefore look at other spheres such as consumption of technologies, and socio-technical networks that influence how technologies are used and deployed. This approach recognises that while the intrinsic qualities of a technology are important for its adoption, unequal gender relations may influence its adoption and dis-adoption. This paper however goes beyond this to consider how processes of scaling up technologies to promote adoption can reinforce or reduce gender inequalities, thereby influencing adoption.

Data analysis will focus on the themes contained in the following model, which is in line with feminist thinking on technology adoption:

### *2.1. Socio technical environment*

The socio-technical environment refers to the space in which institutions, technologies, socio-economic rules, images, ideologies interact to influence ability of different people to adopt technologies. The paper adopts Acker's understanding of gendered institutions as the "various sectors of social life" within which male hegemony is legitimised through the use of images, symbols and ideologies that discriminate women and delegitimise their participation (Acker 1992: 562). From this perspective, extension services and community groups fall under gendered institutions. These are often important institutions in the scaling up of agriculture technologies. Markets can be regarded as institutions because they also reproduce male hegemony through the processes and images in which markets are organized, but for the purposes of this paper we are considering them separately since they require significant attention due to their direct link to the sustainability of production processes. In all this, what happens at the household level is also important to consider in scaling up processes and models since it influences women's ability to navigate the socio-technical environment to adopt promoted improved technologies. As Theis et al. (2018) argue, how technology is to be used within households and who benefits from such use is often a negotiated process.

## 3. Context

The research on which this paper is based was conducted in Chikwawa and Phalombe in Malawi, in villages that cultivate sweetpotato. Although sweetpotato is cultivated by small-scale farmers and occupies only 5% of the cultivated area (Minot, 2010), it is a primary staple in Malawi (Low et al., 2017), and is the most important root crop after cassava (Chipungu et al., 2017). It is suggested that the importance of sweetpotato in Malawi increased after a severe drought in the mid-90 s because the crop is relatively more drought tolerant than maize. In addition to being a food security crop, the importance of sweetpotato as a source of cash in rural areas is also increasing (Moyo et al. 2004).

In Malawi, the long dry season often means insufficient planting material at the start of the rainy season, which is a major challenge for sweetpotato production (Kapinga et al., 1995). Chikwawa and Phalombe are also prone to flooding. For example, in 2015, "over 385,000 people were affected in the Lower Shire Valley (Chikwawa and Nsanje), and 120,000 in Phalombe" (CRS 2015:3). Under these conditions, the Irish Aid funded Rooting Out Hunger in Malawi with Nutritious Orange-Fleshed Sweetpotato (OFSP) project sought to introduce biofortified sweetpotato. The project aimed to increase sweetpotato yields, improve food security as well as nutrition, particularly addressing vitamin A deficiency. The project also aimed to promote a new way of producing and managing the production of sweetpotato planting material to ensure the availability of clean and improved seed. Thus. a technology package which included new improved vitamin A fortified sweetpotato, and seed management and multiplication techniques was introduced. Seed management and multiplication techniques included vine planting techniques such as sweetpotato vines in beds with enough spacing to enable easy working and monitoring, good agronomic practices such as watering, monitoring and managing pests and disease management, when to cut vines as well as use of clean planting material-. This paper will examine how this technology package was scaled up and the impact of the scaling up process from a gender lens.

Malawi has both patrilineal and matrilineal marriage systems which regulate inheritance and ownership of resources like land. Close to 100 per cent of marriages in Phalombe are matrilineal, with close to 82 per cent of those being uxorilocal, where men move to their wife's village upon marriage, or neolocal, where a couple move to another place or village (Berge et al., 2014). Chikwawa is mixed: close to 72 per cent of marriages are patrilineal and virilocal; and close to 25 per cent are matrilineal, a majority of which are uxorilocal (Berge et al., 2014). While in matrilineal systems women inherit land from their mothers, in patrilineal systems sons inherit land from their fathers. In matrilineal systems, men access land through their wives upon marriage if they are in uxorilocal marriages (Berge et al., 2014). However, in virilocal matrilineal unions, women access land through their husbands, even though descent is traced through the mother's side. On the other hand, in patriarchal communities, women move to their husband's villages and access land through their husbands.

It is often assumed that because women in matrilineal systems own the land they have control over its use. There is therefore a lack of serious analysis on whether ownership automatically translates to control of land, as well as whether this influences intra-household bargaining power (Kathewera-Banda et al., 2011). For instance, although in matrilineal systems women can make some decisions about land, the men's clan and maternal uncles often have the final say in big decisions such as selling of land (Kathewera-Banda et al., 2011). On the other hand, in patriarchal systems women have no right to a particular piece of land and may be forced to move from field to field (Thumba,