Introduction

Agriculture is considered a vital tool in the pursuit of achieving the Millennium Development Goals (MDG) by 2015\(^1\), namely Goal 1 which aims to reduce poverty and hunger\(^2\). Despite the enthusiasm for agriculture as a leading development tool, research and investment in the sector have often overlooked smallholder farmers. In the aftermath of the 2007-2008 food crisis, a global revival occurred which reaffirmed the central role played by agriculture in global development and poverty reduction. Even with this resurgence of interest, agriculture continues to underperform in much of Africa. Among the factors contributing to its underperformance is the serious gender gap encountered by women in accessing productive resources. Women often lack access to land tenure, extension services, credit, improved crop variations and markets, as well as experiencing lower levels of human capital\(^3\). Women are a vital part of agricultural production, making up two-thirds of the global agricultural workforce\(^4\). Closing the gender gap would produce significant development gains by increasing agricultural productivity, reducing poverty and hunger and promoting economic growth\(^5\).

The Food and Agriculture Organisation of the United Nations estimates that increasing female farmers’ access to productive resources could boost yields by 20-30 percent, which in turn would reduce the number of hungry people in the world by 12-17 percent\(^6\). Furthermore, evidence suggests that women are more likely than men to spend their income on the wellbeing of their families, including more nutritious foods, school fees and healthcare\(^7\).

Concern’s Approach to Conservation Agriculture

In 2004, Concern began promoting Conservation Agriculture as a viable alternative to traditional farming practices. Its adoption seeks to support smallholder farmers to address their poor production outcomes and prevent environmental degradation, whilst recognising their resource constraints. Conservation agriculture is a radically different way of farming founded on three key principles, as outlined in Figure 1. Concern’s Conservation Agriculture programme focuses on reducing soil disturbance through the use of permanent planting basins (zai holes), a technology from the Sahel that has proven successful in semi-arid areas. Soil cover is achieved through the use of crop residues, with additional grass mulch as required. The main carbohydrate crop (maize or sorghum) is rotated with a legume crop (groundnuts, cowpeas, soybean) and a third crop chosen by the farmer, usually a cash crop (soybean, sunflower) or a food reserve crop (sorghum). The legume crop is a key part of the rotation, both to maintain soil fertility and to improve dietary diversity. Together, these simple techniques reduce the energy needed to farm, help avoid excessive depletion of nutrients, enable farmers to plant as soon as the first rains start, maximise the benefits (whilst minimising the cost) of fertiliser and reduce soil erosion.

While Concern’s support for Conservation Agriculture originated in Zimbabwe in 2004, similar projects are now being delivered in Zambia and Malawi through the support of an Accenture Global Giving
Grant and in Tanzania and the Democratic People's Republic of Korea through the support of the European Commission.

Concern promotes the adoption of Conservation Agriculture through the identification of “lead farmers” who are willing to test and promote the approach in their community. Lead farmers are chosen based on their farming skills, interest in new technology and respect within the community. These farmers may not necessarily fall within Concern’s primary target group, the extreme poor, but their participation seeks to galvanise grassroots support and knowledge of Conservation Agriculture, thus producing an enabling environment from which programmes can include and benefit the extreme poor. Lead farmers receive training and inputs from Concern for one growing season and in exchange are responsible for the delivery of replica trainings and support services to targeted beneficiary farmers (i.e. extreme poor) interested in practicing Conservation Agriculture in subsequent seasons. Beneficiary farmers are provided with a full set of inputs (seed, lime, fertiliser and herbicide) in the first season and a reduced amount of inputs in the second season, ensuring that their transition to Conservation Agriculture can be sustained without ongoing support from Concern. To demonstrate the benefits of Conservation Agriculture, lead farmers establish comparison plots using traditional crop production practices, but with the same level of inputs utilised as Conservation Agriculture plots.

In 2012, research conducted in partnership with Jane Maher, a postgraduate student at Trinity College Dublin, examined the impact of Concern’s Conservation Agriculture programme in Malawi on women6. The research focused on women’s time and labour contribution, agricultural production and household food security, intra-household decision-making processes and social capital. A mixed-method research approach was adopted, including semi-structured interviews with Conservation Agriculture farmers, focus groups with lead farmers, agricultural extension workers and community committees and the disaggregation of harvest data collected by Concern. The study population was defined as women in Malawi who have been practicing Conservation Agriculture for at least one year and have harvested crops produced through Conservation Agriculture. A control population of men practicing Conservation Agriculture for at least one year and women practicing conventional agriculture only were included to facilitate a comparative analysis. The following paper outlines the key findings emanating from this research.

**Concern’s Conservation Programme in Malawi**

Malawi is a landlocked country in Southern Africa, 1,500 kilometres from any sea port. It is one of the poorest countries in sub-Saharan Africa, ranked 171 out of 182 countries on the Human Development Index8. Agriculture is the primary economic sector, representing 31.6 percent of its Gross Domestic Product in 201010. Approximately 80 percent of the population live in rural areas11, with 90 percent of these smallholder farmers reliant on rain-fed subsistence farming techniques12. Ploughing of agricultural land in Malawi has intensified in recent years due to land scarcity, which has resulted in significant levels of soil degradation and declining yields. Erratic rainfall, heightened by climate change and a growing population, has led to food insecurity in Malawi, as in much of sub-Saharan Africa. Hunger threatens much of rural Malawi, with in excess of 40 percent of the rural population living in poverty and vulnerable to seasonal food crises. The occurrence of poverty and hunger is exacerbated by a reliance on “ganyu”, an informal off-farm labour market system, through which the poor provide daily agricultural labour on larger farms and agricultural estates in exchange for nominal wages.

Women in Malawi generally fare worse than their male counterparts on most social and economic indicators. Their unequal status is shaped by the interlocking factors of poverty, discriminatory treatment in the family and public life and a vulnerability to HIV and AIDS. The share of women in wage employment in the non-agriculture sector moved from 13 percent in 2000 to only 15 percent in 200613. Furthermore, only 22 percent of elected members of parliament in 2009 were women14. It is estimated that the HIV infection rate in females aged 15 to 24 is about 4 to 6 times higher than the infection rate in males in the same age group15. Gender inequality in Malawi reduces women’s access to productive resources, development opportunities and decision-making processes, inciting a cycle of vulnerability and poverty.

Framed within Malawi’s vulnerability to food insecurity, Concern began promoting Conservation Agriculture as a low-cost form of agriculture which is socio-economically viable for smallholder
farmers in Malawi. The approach sought to improve soil quality, increase yields and build resilience to the increasingly erratic climatic events occurring in Malawi. Among the benefits of Conservation Agriculture is the reduced intensity of labour demands as field preparation can be done year round, rather than once the rains have started. As women are primarily responsible for field preparation and planting in Malawi, the less intensive labour demand is anticipated to accrue greater results amongst women.

Results

1. Less Intensive Labour Calendar

To examine the impact of Conservation Agriculture is having on women in Malawi, women were asked to carry out a labour requirement chart indicating how long it took, in days, to carry out each activity under conventional agriculture and Conservation Agriculture. Analysis of the data collected found that throughout the year the labour requirement for conventional agriculture was consistently higher. Conservation Agriculture reduced the labour demand by an average of 34-35 days compared to conventional agriculture.

Conservation Agriculture presented a less intensive labour calendar; the cultivation period extended from June to May, compared to October to May under conventional agriculture. This is due to land preparation beginning earlier under Conservation Agriculture as fields can be prepared during the dry season, whereas under conventional agriculture ploughing is only possible once the soil has been softened by the rains. Under Conservation Agriculture ploughing of land is eliminated and many women were apprehensive that this would result in increased weed density. However, those who participated in focus group discussions affirmed that weeding was less intensive, as it could now be done by hand, whereas under conventional agriculture weeding requires a hoe. Furthermore, no increase in weed density when practicing Conservation Agriculture was evident, attributable to the high levels of soil mulch cover which restricted weed growth.

“I decided to start using Conservation Agriculture because I get more yield from a small piece of land and it means I can spend more time with my family. With traditional farming I had to spend more time making ridges and that means less time with my family.”

Photo: Doris Malinga, Dwerog Field, Kabudula, Lilongwe District, Malawi.
Jennifer O’Gorman, Concern Worldwide, May 2012
2. Increased Agricultural Production

The research also examined production outcomes as outlined in Figure 2 below. The analysis focussed on: Conservation Agriculture female lead farmers, b) Conservation Agriculture female farmers, c) Conservation Agriculture male farmers and d) conventional agriculture female farmers, harvesting maize, soya and groundnuts. Analysis of production data by type of agriculture practiced and gender found that female lead farmers practicing Conservation Agriculture recorded similar yields to male farmers practicing Conservation Agriculture. However, female farmers practicing Conservation Agriculture recorded significantly lower yields to both female lead farmers and male farmers practicing Conservation Agriculture, with the exception of groundnuts, where female farmers outperformed male farmers practicing Conservation Agriculture. The increased yield recorded by women cultivating groundnuts is attributable to its nutritional value for households, while male farmers were reported to prioritise maize and soya production as cash crops. The project was implemented at a time when demand for the traditional cash crop, tobacco, was declining, while market demand for soya was rising, making it an attractive cash crop. Male and female farmers practicing Conservation Agriculture recorded significantly higher yields than female farmers practicing conventional agriculture. However, no data was available as to the level of inputs used in conventional agriculture plots, thus restricting comparative yield analysis between Conservation Agriculture and conventional agriculture.

Figure 2 - Comparison of harvest data by type of agricultural practice and gender (0.25 ha yield was captured and converted to kg/ha)

Interviews conducted with agricultural extension workers engaged in the project concluded that female farmers (both Conservation Agriculture and conventional agriculture) had poor education and literacy rates and lacked access to inputs and extension services. These factors are likely to negatively impact upon their agricultural productivity. Data recorded on the education level of all groups found that male farmers had the highest level of education, an average of eight years, compared to between five to six years among women. The variance in years of education is likely to contribute to the reduced production outcomes experienced by women practicing Conservation Agriculture and conventional agriculture.

Analysis of production outcomes recorded among female farmers engaged in Conservation Agriculture indicated that yields were also influenced by the gender of the agricultural extension worker assigned to them. Female farmers receiving training and support services from other female lead farmers recorded higher yields than those receiving the same training and support services from male lead farmers.
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Finally, lead farmers were identified during the first year of the project, and during the research period, they were practicing Conservation Agriculture for the second year. The favourable production outcomes recorded among this group suggests that the yield gap may be reduced as farmers deepen their experience and knowledge of Conservation Agriculture.

**Benefits**

**Dependency on “Ganyu”:** Women engaged in Conservation Agriculture were able to reduce their dependency on “ganyu” (informal off-farm labour market system), as a secondary income source. Their increased agricultural productivity, which resulted in greater food security at household level, was the primary factor informing this shift in livelihood strategy.

**Food Security:** Food availability at household level was extended by an average of one month among female farmers practicing Conservation Agriculture. **Figure 3** below outlines the household food availability calendar among women engaged in Conservation Agriculture, compared to women engaged in conventional agriculture.

**Figure 3**—Comparison on months of food availability experienced by women engaged in Conservation Agriculture and conventional agriculture

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Food consumption patterns between women practicing Conservation Agriculture and conventional agriculture showed only limited variance. Households engaged in Conservation Agriculture consumed more maize, nuts, beans, vegetables, poultry, fish, oils and fats. However, households engaged in conventional agriculture consumed more fruit, meat, eggs and dairy products. Fruit, meat, eggs and dairy products are expensive food items in Malawi, and women engaged in Conservation Agriculture reported favouring the consumption of fish and poultry, which are cheaper sources of protein, and allocated the balance of expenditure to meet other household needs such as education and health care. The variance in dietary diversity is likely to be influenced by income levels and the role played by women in decision making at household level. However, no data was collected to validate either of these influencing factors and their relationship to household dietary diversity.

**Resilience:** Households practicing Conservation Agriculture have an increased ability to cope with shocks and stresses. Conservation Agriculture contributes to improved soil fertility due to soil cover, mulch and the addition of compost. Even in years experiencing delayed, sporadic or poor rainfall, farmers practicing Conservation Agriculture benefit from higher residual moisture levels, which enable seeds to germinate as permanent planting basins (zai holes) trap water and sustain crop maturity.

Households experiencing stresses such as illness or injury have greater resilience as Conservation Agriculture presents a less intensive labour requirement. Elderly, ill or injured household members were capable of carrying out light labour activities and thus contributed to their household’s productive capacity.
Decision Making: Women engaged in Conservation Agriculture were found to have increased involvement in decision making at household level, spanning from agricultural practices and crop use to household expenditure. Women reported their increasing involvement in decision making related to the use of crops produced through Conservation Agriculture. Almost half of respondents (45 percent) stated that they made the decision on whether a Conservation Agriculture crop was sold or retained at household level, compared to only 14 percent among women engaged in conventional agriculture. The above findings suggest that engagement in Conservation Agriculture positively affects the role of women within the household, including greater influence in decision making related to household expenditure.

Social Standing: Social status was heightened among women engaged in Conservation Agriculture, with 95 percent of respondents experiencing greater self-confidence and an elevated status in their community. Women reported forming stronger ties with other farmers and increased their participation in community groups. 73 percent of women engaged in Conservation Agriculture were members of community committees, compared to only 20 percent of women engaged in conventional agriculture. Similarly, 65 percent of women engaged in Conservation Agriculture had assumed leadership positions in community committees (positions included secretary, treasurer and chairperson), compared to 58 percent of women engaged in conventional agriculture. 73 percent of women engaged in Conservation Agriculture were members of community committees, compared to 58 percent of women engaged in conventional agriculture. It should be noted that the above shift in the contribution made by women to decision-making processes and improvements in their social standing are not directly attributable to Conservation Agriculture as a farming system, but rather Concern’s Conservation Agriculture programme. Further research is required to examine confounding factors and programme outcomes contributing to the behaviours, attitudes and practices of women engaged in Conservation Agriculture, and the wider society.

Conclusion

From the above results, there are clear positive impacts for women who practice Conservation Agriculture, in the areas of time, labour, agricultural production, food security, decision making, social status and confidence. It has helped to create a sense of time and control for women. Conservation Agriculture has a role to play in increasing women’s participation in agricultural production and reducing household vulnerability in Malawi. However, there is still a lot to be done to help empower women; culturally there are still challenges and issues which women have to overcome. The findings indicate that Conservation Agriculture, as a farming system, can certainly contribute to diminishing the gender gap in agriculture.
Reference and Content Notes


8. The research was conducted by Jane Maher in fulfilment of Trinity College Dublin’s Master of Science in Environment and Development. The research report was titled, ‘The Impact of Concern’s Approach to Conservation Agriculture on Women: Evidence from Malawi’.


