

*Full Length Research Paper*

# **Women's empowerment: A gender outcome of an improved agriculture health and nutrition project in Zambia and Malawi**

**Amare Tegbaru<sup>1\*</sup>, John G. Fitzsimons<sup>2</sup>, and Therese Gondwe<sup>3</sup>**

<sup>1</sup>International Institute for Tropical Agriculture, East Africa Regional Hub, Tanzania.

<sup>2</sup>Ontario Agricultural College, University of Guelph, Canada.

<sup>3</sup>International Institute for Tropical Africa, Southern Africa Regional Hub, Zambia.

Received 16 March 2021; Accepted 26 May 2021

**HIV Aids has had a major impact on resource-limited African rural Sub-Saharan communities, especially upon women who typically experience greater gender inequity, have fewer assets and greater food insecurity and vulnerability. Coordinated interventions in crop productivity, nutrition, AIDS treatment, and livelihood security can have significant positive impacts on individuals and households; however their impact upon gender relations and social equity is unclear. Qualitative interviews and an integrative model of factors influencing women's empowerment are used to examine this issue in four villages of the Miracle Project in Zambia and Malawi. Although some local agency and NGO programs existed in these villages prior to project inception, female respondents reported improvements in crop productivity and income, some initiation of new enterprises, improvement in ownership of assets and housing quality and access or re- access to kinship or community based mutual assistance networks from which they had been excluded. Consumption of the introduced quality protein maize and products from home processing of soyabeans were cited as improving household nutrition. Together with increased accessibility to retroviral drugs, women's health has improved; levels of poverty and stigmatisation have reduced and allowed many to display an improved degree of empowerment.**

**Key words:** HIV/AIDS; nutrition; agriculture; gender; social inclusion; empowerment.

## **INTRODUCTION**

HIV/AIDS has had a major impact on rural households and communities in Southern Africa (Mutangadura and Sandkjaer, 2009). It directly affected the health of individuals, their households and communities (UNAIDS, 2008). It reduces labour supply, productivity and household nutritional status through reduced food production and income (Baylies, 2002; WHO, 2002). It increases costs of care of those infected, sets the household on a downward spiral (Parker et al., 2009)

reinforced by the disintegration of family/ community support networks, stigmatization and social exclusion (Ganyaza-Twalo and Seager, 2005) leading toward a persisting and chronic poverty. Women are more significantly affected than men since they typically experience gender inequity (Hejase et al., 2015; 2020), have fewer assets and experience a greater degree of food insecurity and vulnerability (Whitehead and Kabeer, 2001; Meinzen-Dick et al., 2011).

\*Corresponding author. E-mail: [a.tegbaru@gmail.com](mailto:a.tegbaru@gmail.com). Tel: +46765509629.

Author(s) agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

Coordinated interventions involving improvements in AIDS treatment, food production, nutrition, and livelihood security have the potential for a significant positive impact on individuals, households and communities dealing with HIV/AIDS (Haddad and Gillespie, 2001; Baylies, 2002; Panagides et al., 2007; Samuels and Naomi, 2011; Weiser et al., 2011). However, it is unclear if such projects can also have a positive impact on gender relations in these communities (Meinzen-Dick et al., 2011). The question is addressed in this study of the impact on women participants in the project "Making Agricultural Innovations Work for Smallholder farmers Affected by HIV&AIDS" (MIRACLE) in Southern Africa funded by the Swedish Agency for International Development and undertaken in AIDS "hotspots" in Zambia and Malawi between 2010 and 2014 (IITA, 2010).

### **Miracle project**

The project's objective was to sustainably improve livelihoods by improving agricultural production, processing, consumption and marketing of nutritionally improved crops, encouraging supportive health and agricultural policies and developing the capacity of key stakeholders. Action sites selected by MIRACLE were those where governments and development partners already had a range of ongoing interventions in activities such as health care, provision of Anti-Retroviral Treatment, improved nutrition, access to credit and the improvement of agricultural productivity. However, these ongoing interventions often lacked integration and were under resourced (Ellis-Jones and Gondwe, 2013).

Crops introduced by the project included drought tolerant quality protein maize, soybean, cowpea, cassava, orange fleshed sweet potato, sorghum, groundnuts, common beans, pigeon peas and vegetables. Training was conducted in villages on nutrition enhancement, food processing and health. The project was designed with a gender mainstreaming strategy to reduce gender inequalities, encourage gender specific activities and increase participation by women and youth (IITA, 2010).

The project brought together research and extension institutions, NGO's, CBO's, agro-processors, input suppliers and financial institutions in local level Innovation Platforms (IP's) using participatory and value chain approaches operated within local governance structures. Capacities in farmers, farmer organizations, CBOs/ HIV-AIDS support groups and extension staff, nutrition and health promoters were developed through training. The local IP's provided effective uptake of improved technologies by coordinating activities and agencies and providing forums to generate feedback (Ellis-Jones and Gondwe, 2013).

A Lead Farmer program and nutritional promoters were used at the village level to disseminate improved

technologies. Male and female Lead Farmers received training from the project on crop production technologies then served as trainers in their own communities, planting their own farms and applying techniques learned in training. They trained 15 to 20 other "Secondary Farmers" from their community by regularly meeting to discuss elements of cultivation and production.

### **Study communities**

The study was undertaken in 4 rural villages, two in Zambia and two in Malawi in areas where a majority of households were characterized by poverty, vulnerability and a relatively high proportion of households impacted by HIV/AIDS.

### **Zambian villages**

The two Zambian villages were in Kazungula District in the south of the country with an annual rainfall between 700 and 900 mm per year between October and March and temperatures ranging between 17C to 35C. Soils are mostly sandy-loams and clays with agriculture the dominant form of livelihood in both villages. Principal crops are maize, millet, sorghum, soya, groundnuts, beans and cassava with livestock including cattle, goats, pigs and chickens (FEWS Net, 2014). Food scarcity occurs between November and March and some 40% of males from the villages migrate out for work during the dry season between May and October.

One of the study villages contained 120 households with a total population of approximately 250 and twenty percent of households headed by women. The village population had doubled in the past 10 years as a result of increasing birthrate and in-migration. Two thirds of the current population was Christian with the remainder Muslim. The second village was entirely Christian with 113 households and a total population of 1100 and approximately 10% of households were female headed. A cooperative supplied farm inputs in both villages and an NGO ran a school program for the poor. A CBO provided a health worker for HIV and an ART drug distribution program. Village Savings and Loan groups were established by an NGO in the past. Both villages were matrilineal in nature with men preparing the land and remaining activities shared with women.

### **Malawi villages**

The Malawi study villages were located in the Chitekwe Extension Planning Area in Lilongwe. The Lilongwe plain is one of the most fertile areas of the country with annual rainfall ranging between 800-1000 mm between November and April (Ng'ambi et al., 2015). Main crops

cultivated are maize, soya, green beans, cowpea, sweet potato, cassava and groundnuts together with some tobacco. Livestock comprises cattle, goats, chickens and pigs with some sheep (Malawi National Vulnerability Committee, 2005). Food scarcity in both villages occurred between November and March.

The first village has 190 households ranging in size from 5 to 10 persons with the population increasing by approximately 50% in the past 10 years. The second village has 42 households, an increase from 30 ten years ago. Both villages are Christian and are matrilineal in nature. Polygamy is common, with wives mainly living apart. An “average” household has six persons with a mean cultivated area of 1.5 acres. Male household members frequently seek work outside the community. Household credit needs are served by VSL groups, money lenders and social networks of family and friends. CBO’s, church organizations and NGOs are main sources of support for AIDS sufferers with distribution of ARV drugs initiated prior to the establishment of the Miracle Project. Both villages were seen as slightly more prosperous than ten years ago.

## METHODOLOGY

The research is based on qualitative interviews and focus groups with 62 female respondents (45 in focus groups and 17 individuals) from the four villages conducted in 2014. Focus group and semi-structured interview guides were modified from those included in Badstue et al. (2014) to suit local circumstances. The guides included a community profile, a focus group module covering gender norm, innovation practices, labour and market trends and the Ladder of Life tool (Lunde, 2009) defining wealth categories and dynamics during the previous ten years. Individual, semi-structured interviews were conducted with women using the Innovation Pathways and Individual Life Story modules to provide insights into changes in women’s empowerment.

### Evaluation of women’s empowerment

Empowerment is a concept with a diverse range of meanings (Meinzen-Dick et al., 2011). At an individual level, researchers such as Deere and Twyman (2012) treat empowerment as a dynamic process depending upon: (1) access to material assets; (2) access to knowledge and know-how; (3) improved capacity, including ability to make decisions; and (4) the ability and self-confidence to make choices. Women’s empowerment involves increases in opportunities -ranging from access to or ownership of assets to increases in mobility and personal decision making— and efforts to overcome attitudes, norms and practices restricting participation (Kabeer, 1999; 2001; 2012). This paper recognizes that empowerment is a long-term and transformative process.

The practical evaluation of women’s empowerment in this study draws on Farnworth et al. (2013) operationalization of the term which has three principal dimensions; agency, relations and structure. Agency is the ability of a person to make choices and act upon them – requiring effective access to both physical and financial resources. Relations are the ability to participate and create benefit from networks both within and between communities and with external agencies. Structure refers to the “visible” cultural, political, economic and social organizations ranging from the

household to the community and beyond together with “invisible” values, social/ cultural norms, assumptions and ideologies which underlie and maintain these structures. The impact of a development project on empowerment thus requires an examination of the ways in which the project’s activities have an impact upon these elements.

### Analytical framework

The framework used to explore the effect of project activities in terms of women’s empowerment [and gender equity] is based upon a combination of the CARE “Pathways to Empowerment” model (Njuki et al., 2013; Miruka and Hillenbrand, 2016) and aspects of empowerment as defined by Alkire et al. (2013) modified by available data. In the CARE model, the process of empowerment results from the “positive interaction of a range of contributing dimensions”, the interactions being “non-linear and without a single causal pathway” (Njuki et al., 2013; Mhango et al., 2015). Given focus on areas heavily impacted by HIV/AIDS, the Productivity and Profitability component in the CARE model is expanded to a Health, Economic and Social Well-Being component. The model (Figure 1) links changes in elements of women’s empowerment to aspects of women’s Health Status, Economic and Social Wellbeing, which in turn link back to Empowerment. Improvements in Empowerment, Health Status and Economic and Social Well-Being both individually and in combination could influence changes in gender equity.

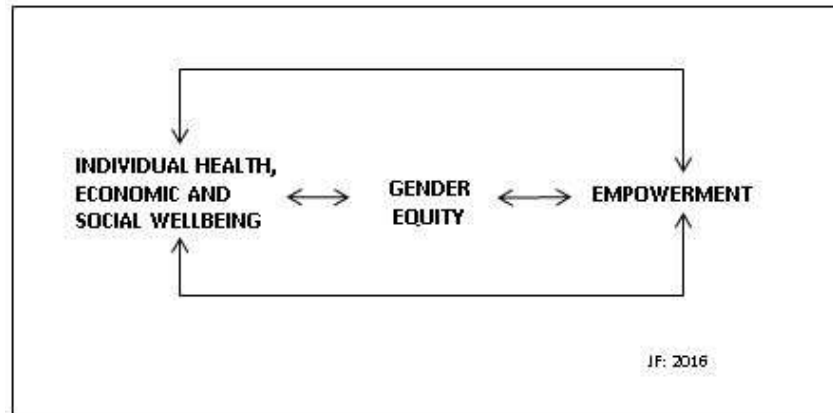
HIV/AIDS directly and indirectly adds significantly to constraints. Directly by reducing productive capacity, income and nutrition of individuals and the household (Mutangadura and Sandkjaer, 2009) and indirectly by disrupting inter -household and intra- community networks and mechanisms which allow the household to weather variability in its circumstances (Drimie, 2002). In the discussion of each component of the model, the potential impact of HIV/AIDS is explored.

The Empowerment component module (Figure 2) contains domains including resource ownership and credit access, involvement in household decision making and participation in formal and informal groups. Changes, positive or negative in any of these domains will influence the overall degree of a women’s empowerment.

### Ownership/ control of resources (Assets)

The resources considered in this segment comprise the degree of a woman’s ownership or control of farm and household assets and access to formal and informal credit. Increasing women’s control over assets and property rights increases their bargaining power within the household, increasing household productivity and the well-being of women and children leading eventually to an improvement in overall empowerment (Doss, 2013; 2015). Women’s ownership of and access to farm assets involves a number of categories; land, large livestock (oxen or cattle), small livestock including poultry and farm tools and equipment. Household goods and personal assets include the condition of the house and its contents, consumer items, jewelry, cell phone and means of transport.

Individuals suffering from HIV/AIDS in a household will have a significant impact on resource ownership and property rights. Assets, both productive and household, may be sold to pay for the costs of care or the loss of income from an affected household member. Depending upon whether the community is patrilineal or matrilineal, the death of a husband may also lead a wife to lose land/ household assets to other family members (Chapoto and Jayne, 2008).



**Figure 1.** The study framework developed from CARE (2013a, b) and Miruka and Hillenbrand (2016).



**Figure 2.** The Empowerment Component.

Access to formal or informal credit resources is essential for resource limited rural households – both to engage in productive activities and to survive the natural and economic variability of their production environment (Fletcher and Kenney, 2011). Loss of productive assets removes the collateral such assets provide for formal credit access. Access to informal credit which can come from both family and community-based sources and can take the form not only of cash but also food, seed, fertilizer, labour, etc. is derived in a large part from the social capital generated by the household through reciprocated interactions both within the family and the broader community. Access to this “credit” can be disrupted if the household’s ability to reciprocate is reduced or eliminated (Baylies, 2002; Tsai et al., 2013).

#### **Decision making related to production and income**

The degree of a woman’s involvement in decisions regarding her household’s agricultural production activities and the use of income generated are a significant indicator of her degree of empowerment (Malhotra et al., 2002) and have been shown to have a positive

impact on her wellbeing and that of her children (Malhotra, 2003; Quisumbing and McClafferty, 2006). Decision making roles will be largely influenced by the area’s kinship structure, which in the matrilineal case will see the wife primarily responsible for food security related decisions and the man for cash crops (Tschirhart et al., 2015). The death of the husband will have a significant impact on the household’s resources through inheritance and on-going access to land resources by the widow may be substantially reduced, especially if a number of wives are involved. Even in a matrilineal community the wife may be completely dispossessed by the husband’s relatives (Tschirhart et al., 2015).

#### **Involvement in social and economic groups**

A final element of the empowerment component is a woman’s access to and effective involvement in social and economic groups. In resource limited households, the focus is primarily on social capital – the “norms of reciprocity and networks of civil engagement” (Putnam et al., 1994). Social capital can exist in a number of forms. At the household level, social capital is primarily Bonding Social



**Figure 3.** The Health Economic and Social Wellbeing Component

Capital – the bond between parents and children, spousal relationships, bonds between siblings, bonds within a family clan and women's credit groups that exclude men. Bridging Social Capital is more formal and includes membership in churches, political parties or farmer organizations as well as linkages to traditional chiefs. Linking Social Capital involves mainly village level linkages to external agencies – Village Development Committees, and institutional organizations (Dzanja et al., 2013). For most resource limited households, Bonding Social Capital forms the family and community networks of reciprocal mutual aid taking the form of loans of food, domestic supplies or cash, enabling individuals and their families to survive periods of hardship. In resource limited households, HIV/AIDS has a significant disruptive impact on social capital, particularly the bonding form, though its linkage to disability and economic capacity (Dawson, 2013; Tsai et al., 2013).

### Health, economic and social wellbeing

The aspects of health, economic and social well-being considered in this model include health status, nutrition and food security, economic well-being and social well-being (Figure 3). Changes in any of these elements for women will be either positive or negative and will in turn influence and/or be influenced by their degree of empowerment.

### Health, nutrition and food security

In rural areas of sub-Saharan Africa (SSA), lack of access to land resources, to services and markets, and a lack of labour and productive assets severely constrain agricultural productivity (Harsmar, 2006) and this is especially true in female headed households (Kassie et al., 2015). Low agricultural productivity reduces household food supply, food security and income (FAO, 2003; 2008) and leads to varying degrees of seasonal or permanent food insecurity (Gross et al., 2000). Undernutrition leads to poor health, increased susceptibility to disease (Hindin, 2005) and reduces effectiveness of effort in work. The overall impact is a reduction in the ability of rural women to improve their circumstances and those of their families (Sitko et al., 2011). The poorest households may be forced to address long term food insecurity by begging. Regular periodic food shortages in the study areas may be addressed by a reduction in the number of meals taken per day or laboring on other farms ("*ganyu*" in Zambia) usually with food as payment.

HIV/AIDS has a cumulative negative impact on the level of nutrition and food security of households. AIDS development in an adult results in a decline in the household's overall productivity, increased spending on health care, and an increased need for care, with the burden falling primarily on women (Weiser et al., 2011). As more adults succumb, food production and income drop dramatically, family savings are eliminated, household assets are sold, and support is sought from relatives and/or loans. Finally, death of a household member results in funeral costs as well as the potential loss of productive resources, the extent depending on the system of inheritance (Farnworth et al., 2013).

The availability of care for AID's sufferers in the form of either Home Based Care (HBC) or Anti-Retroviral Therapy (ART) in rural Zambia and Malawi has increased significantly within the past twenty years, with ART having an important positive impact on both the health and life expectancy of rural HIV/AIDS sufferers (Fox et al., 2010).

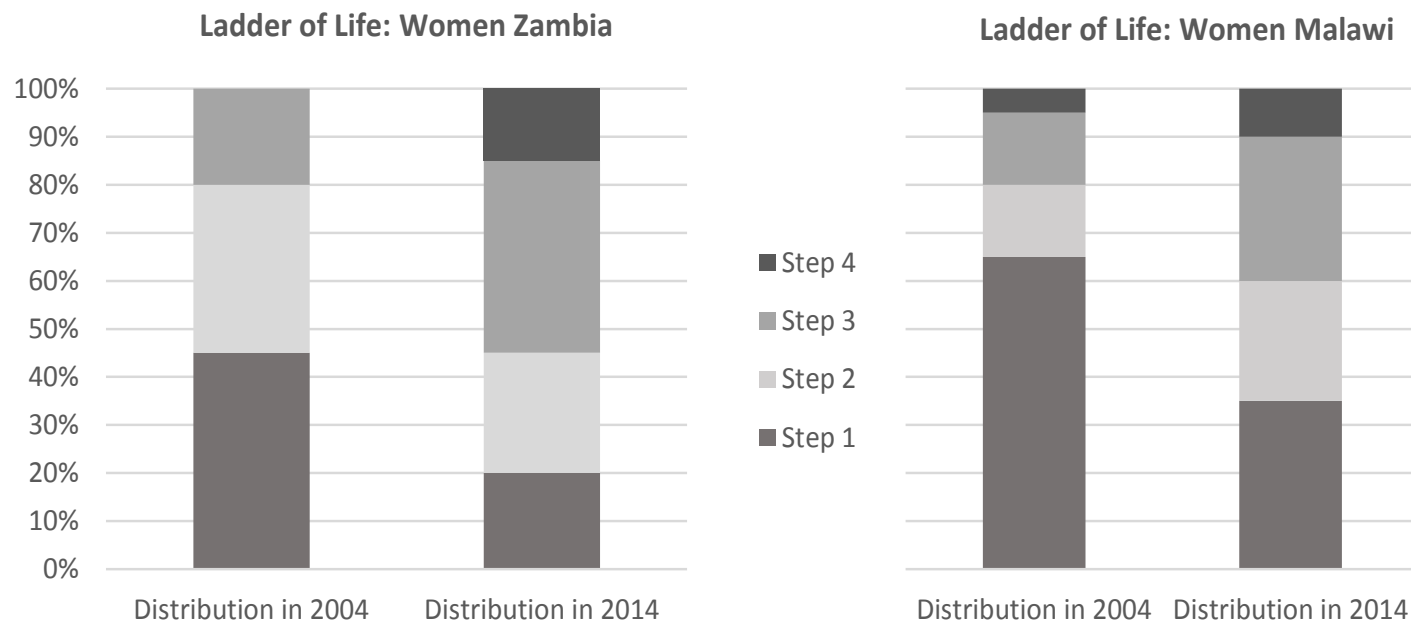
### Economic and social well-being

The final component of the model is Economic and Social Well-being. The level of a woman's economic well-being is determined in large part by the productivity and profitability of the household's economic activities. These are modified both by changes to income from on farm activities or in the need to participate in casual off-farm work to support the household. They will also be reflected in changes to the physical structure and condition of the family home, its contents and the ability to pay the fees of school aged children.

A woman's social well-being is measured by the level of respect or degree of stigmatization she experiences within her extended household and the community. Stigmatization is a social construct used to differentiate and devalue those affected from the normal social order (Mbonu et al., 2009). Stigmatization can result from wide range of causes including disease, a personal or associative characteristic, a behavior, a practice or poverty and will result in the exclusion of individuals or groups from familial and community based networks of mutual aid (social capital) affecting access to loans of food, cash or other necessities in times of need.

## RESULTS AND DISCUSSION

The use of comments from individual respondents and focus groups in the study villages to explore changes in the health/economic/social well-being and empowerment



**Figure 4.** the distribution of ladder of life of women in Zambia.

elements of the model framework and the impact of changes generated by the Miracle project and longer term activities initiated in the study villages by organizations prior to the Miracle project's initiation.

#### Health, economic and social wellbeing component

The adoption of improved crop technologies and small-stock by women participants delivered through the project has resulted in both increased crop production and income for many participants.

*"When I joined the MIRACLE project I was eligible to receive the first Obatanpa maize (DTQPM), which the MIRACLE project introduced to people living with HIV and the cowpeas. That was the first year I started doing farming. In the first year (2012), I was able to get 3 big cart loads of harvest. In the second year (2013), I had a bumper harvest and I have never bought maize meal since that time."*

*Respondent 1, 40 yrs old. Married, Zambia*

The improvement of crop productivity coupled with project training in management of small stock also lead to some diversification of the agricultural enterprises on holdings:

*"I have also benefitted from MIRACLE project training of poultry keeping. I got three chicken from MIRACLE. Now I have more than twenty, but at one time I had more than fifty chickens and then I started selling them and getting*

*money".*

*"I grew soya last year and sold the produce after harvest, and after selling I bought pigs and chickens".*

*Respondent 1, 40 yrs old. Married, Zambia*

At the individual level, the improvement in crop productivity and resulting increase in income has led to an improvement in economic well-being for some participants and their families:

*"I am able to buy soap. I wear better clothes. I am able to feed my children. I am paying school fees for my child in secondary school. I have bought chickens."*

*Respondent 2, 37 yrs old Divorced, Zambia.*

*"Now my children are in primary school which is free, I don't pay school fees but I am able to buy sugar, soap and kids go to school with full stomachs".*

*Respondent 4, 46 yrs old. Widow, Malawi.*

An overall measure of the changes in the economic status of women in the Zambian and Malawi villages was determined by the use of the "Ladder of Life" - a wealth ranking technique (Lunde, 2009) comparing the proportion of women in four self-defined groups in the villages in 2014 with their proportion 10 years before. The results are shown in Figure 4.

In the Malawi villages the figure indicates a significant reduction in the "poorest" group. The proportion of households in intermediate steps 2 and 3 has increased, with a small increment in the "better off" category. The Zambian villages show a decline in the proportion in the

poorest group and group 2, an increase in proportion of households in group 3 and the appearance of a “best off” group 4 which did not exist ten years before.

### Health, nutrition and food security

The introduction of crops by the project with improved nutritional status, particularly *Obantampa* maize and legumes has had a significant impact on the nutrition, health and food security of project participants with HIV. The introduction of crops with improved nutritional quality by the project, particularly *Obantampa*, a Quality Protein Maize (QPM) which has superior nutritional value compared to local varieties (Nyakurwa et al., 2017), legumes such as soybean, cowpea has had a significant impact on the nutrition, health and food security of project participants with HIV. Training was conducted in villages on nutrition enhancement through food processing and health to ensure adequate availability and affordability of nutrient dense food that ultimately improved body weight and energy levels of women living with HIV and AIDS

A key informant from the Zambian women groups commented on the introduction of the improved quality protein *Obantampa* maize as well as soya and cowpeas:

*“And from 2012 since I started eating my Obantampa my CD4 count has reached up to 1000. At the beginning when I started taking my ARV’s and before joining the MIRACLE project my CD4 count was 53. Thanks to the MIRACLE project my CD4 count has increased a lot. The accepted CD4 level to be considered as a normal person to do any kind of work is above 500. So now I am physically fit”.*

*“I just thank the MIRACLE project, because ever since I got sick I have been eating and sustaining my life with Obantampa meal. I am also benefiting from the cow peas. I eat a lot of cowpeas and it also makes my food to be nutritionally improved.”*

*Respondent 1,40 yrs. old. Married, Zambia.*

CD4 count is the number of CD4 cells in a person's blood when infected with HIV. If CD4 cells become depleted in untreated HIV infection, the body is left vulnerable to a wide range of infections (Lewden et al., 2007). As noted by the female respondent, to be considered healthy the CD4 level should be above 500 to do any kind of energy demanding work. Similar key informants gave identical testimonies of increase in their CD4 count. Key female informants and respondents from the Malawi communities also noted that training in the preparation of products from soybeans had reduced malnourishment in adults and especially in children and orphans:

*“It has changed the lives of people especially in children who are malnourished and those orphans. We taught them how to make milk and other food stuffs and those*

*with HIV/AIDS have benefited a lot in the crops because they are able to have food on their own”.*

*Respondent 5,31 yrs. old. Married, Zambia.*

The higher yield and shorter growth duration of a number of the Project introduced crops had also helped to reduce the “hungry period” faced by people in the villages:

*“There is no malnutrition in the community because it gives us food early. Problems like malnutrition have decreased and hunger in the family has also decreased”.*

*Respondent 6,43 yrs. old. Married, Zambia.*

The improved yields of crops introduced by the Project had also improved the food security of participants particularly those who possessed a small land base:

*“Because of MIRACLE project. They gave me seeds, they taught me about good farming. They taught me how to plant soybean well. I now get more yields from a small land. I am now meeting my needs. I have enough food throughout the year. I depend on myself now”.*

*Respondent 4,46 yrs. old. Widow, Malawi.*

*“We have food throughout the year. Getting nutritional foods. Had only a small piece of land for farming but now she is getting a lot of crops.”*

*Respondent 3, 36 yrs. old Married, Malawi.*

In Zambia and Malawi both widows as well as those in a relationship with their HIV infected and affected spouses were aware of the nutritional benefits of legumes and its help in improving the soil fertility of their plots. Comments from individual interviews confirmed findings from focus group discussions on the level of awareness of improved production practices, intercropping, multiple cropping, improved nutrition and income.

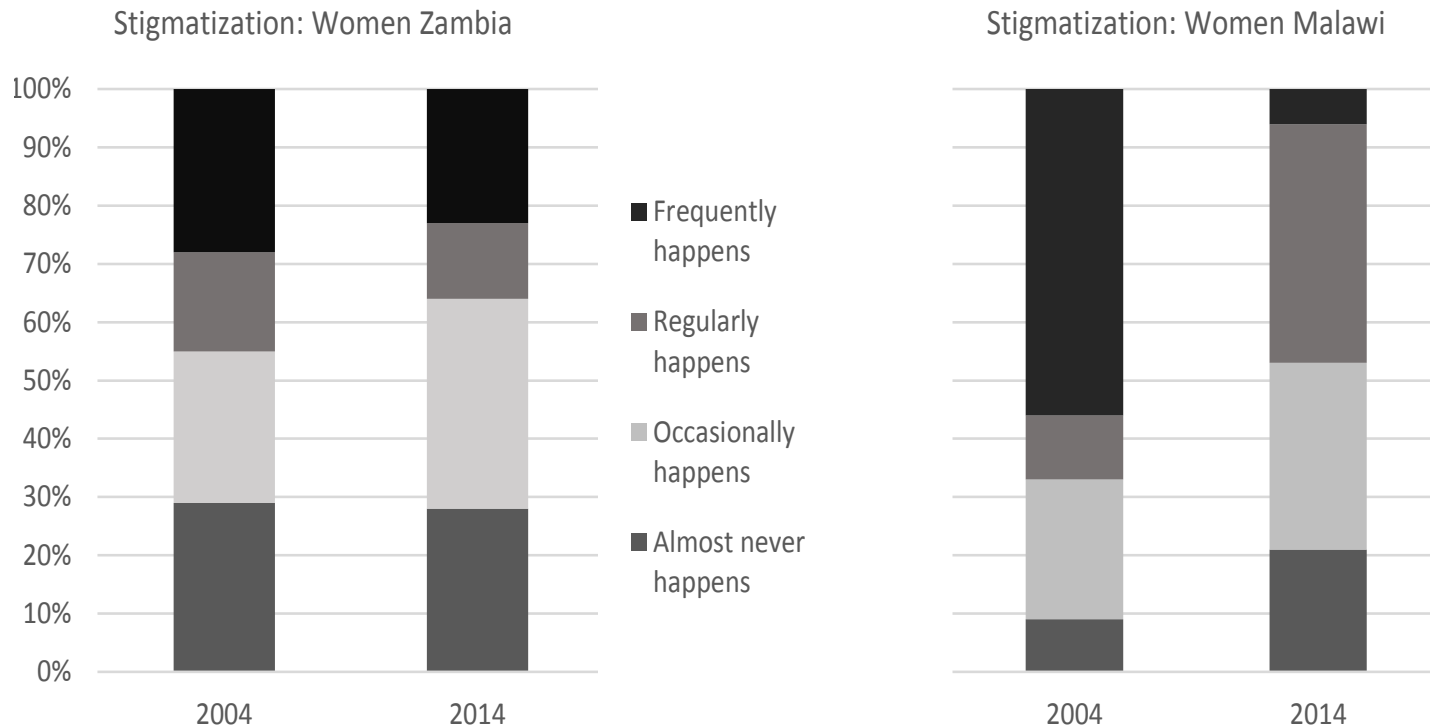
*“I have seed to recycle. I am not only growing nutritious seeds, but also know how to manage my plots and implement soil fertility measure to sustain my farm. I have also started making sausages from cowpeas.*

*Respondent 1,40 yrs. old. Married, Zambia.*

### Changes in social well-being and levels of stigmatization

Individual female respondents indicated positive changes in their social well-being and a decrease in the level of stigmatization associated with both poverty and HIV/AIDS. It should be noted that these improvements would be linked in part to longer term changes in participant's access to HIV/AIDS treatment and other initiatives which have improved life-span in addition to those introduced and facilitated by the Project.

In the past it was clear that both the poor and those with HIV/AIDS suffered significant stigmatization and discrimination:



**Figure 5.** Frequently happens or almost never happens.

*“People used to fear and isolate people with HIV/Aids. When people realized I was HIV positive in 2004 they never wanted to interact with me. People like me were segregated. There was discrimination at that time”.*

*Respondent 1, 40 yrs. old, Married, Zambia*

*“People were always isolated and we did not share food with him or her. The person will not do any development work because they are always isolated”.*

#### **Focus group member, Malawi**

The decrease in stigmatization can be seen both within the family and also in changes in relations within the community:

*“I get more respect from family now. Before I was not staying at home a lot. I was always out working, begging.*

*They used to ask what kind of woman is this who is always out and not at home.”*

*Respondent 2, 37 yrs. old. Divorced, Zambia*

*“Poverty is not a good thing; if you are poor people they don’t respect you. Now my respect is increasing, now I have enough food and I am no longer begging for food”.*

*Respondent 3, 36 yrs. old. Married, Malawi.*

*“People have seen now even people living with HIV/AIDS*

*also do better in their lives. They can do like other people without this sickness*

*Respondent 1, 40 yrs. old. Married, Zambia.*

*“At this time I am almost considered as one of the bread winners in the community. People come to me to give them buckets of maize, seeds and advise how to do their farming and I am being respected.”*

*“MIRACLE project has changed my life and the lives of others who are in the same situation like me. Now people are coming to me to give them seeds, ask for advice and share food with me. We hug and embrace each other, laugh and cry together without fear and stigma”.*

*Respondent 1, 40 yrs. old. Married, Zambia*

At the community level, village focus groups provide insights into changes in the degree of stigmatization in the past ten years. Groups were asked to indicate the level of stigmatization in the village on a four point scale from “Frequently Happens” to “Almost Never Happens” (Figure 5).

Changes in the proportions of women facing different levels of stigmatization indicate quite different situations in the Zambian and Malawi villages. In the Zambian case, the proportion reporting stigmatization “Regularly Happens” and “Frequently Happens” has declined but the “Almost Never Happens” proportion remains approximately the same. In the case of Malawi, the picture has changed markedly since 2004 with the



proportion reporting “Frequently Happens” declining substantially between 2004 and 2014 with an associated increase in the intermediate levels.

### **Ownership/ improvement of assets**

A number of respondents indicated an improvement in the ownership of assets including livestock, land and housing as well as improvements in the quality of their housing:

*“I have a house in our village, its iron roofed, it is with cement”.*

*Respondent 7, 42 yrs. old. Married, Malawi.*

*“I built a new house, (with) iron sheets and bought two cattle. I am becoming good to do the conservation agriculture every year. I got more and cultivated better than the way I did the previous years. Now I am the best in my community”.*

*Respondent 8, 40 years old. Divorced, Zambia.*

### **Access to credit**

No use of formal sources of credit was reported by women in either the Zambian or Malawi villages. The main source of credit in both areas were VSL groups established and facilitated by NGO's some time prior to the start of the Miracle project. Earlier research in Malawi (Molloy et al 2016; Waller, 2014) indicated that women participating in VSL's tended on average to be wealthier than non-participants. However, the interviews indicate an increased level of effective participation of women in village VSL's has resulted from both the improved nutrition and income generated by crops introduced by the Project as well as the improvements in health status as a result of ART programs.

*“I have joined VSL to be able to buy fertilizer to put in my garden. In the past I could not buy seeds. I used only local varieties. I will get more yields with hybrid and fertilizer.”*

*“I am a member of Village Savings Loans, I joined last year because Miracle project gave VSL the seeds. So I was forced to join also I saw others borrowing money to buy fertilizer”.*

*Respondent 9, 24 yrs. old. Married, Malawi.*

It is also clear that access to credit through VSL's has enabled many women to undertake activities on their own and reduce reliance on their husbands:

*“Now women borrow money and use it for business and fertilizer. In the past they just depended on the husband, now they depend on themselves”.*

*Focus Group Member, Malawi*

Access to and involvement in other village level socio-economic groups has also been stimulated:

*“I belong to the woman's club, the Cooperative, IITA and also PTA. It is important to belong to a group, cooperative or a club because you learn a lot of things which will improve your way of living. The Cooperative is being helped by the government by giving them the FSP (fertilizer support program) and IITA gives her chosen crop”.*

*Respondent 10, 52 yrs. old. Widow, Zambia.*

The improved access to VSL's has also facilitated a greater degree of independent action within the household and community by some women:

*“Women's clubs are good for women and they are not overpowered by men”*

*“Village savings and loans. They are able to borrow secretly money from the group and help their husband take care of their home”.*

*“Borrow money and use it for business and fertilizer. In the past they just depended on husband now they depend on themselves”*

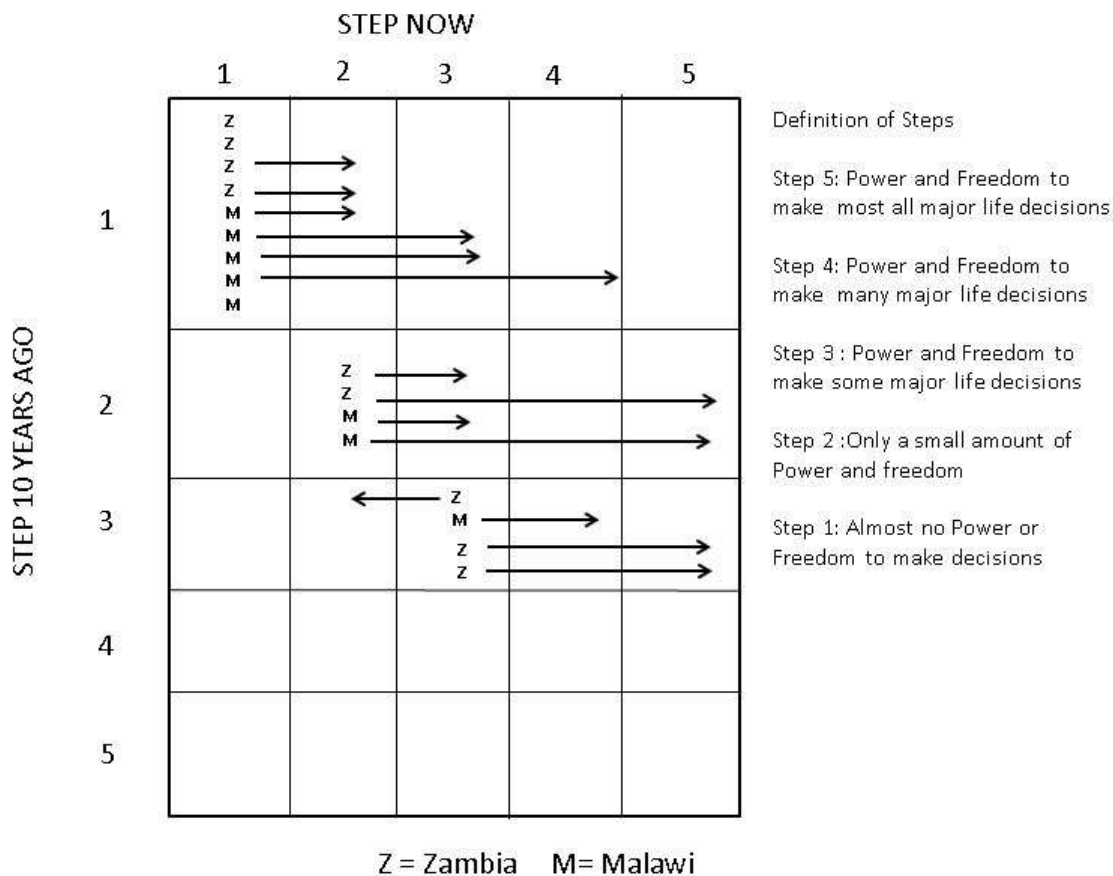
*“VSL getting loans for iron sheets build better homes send children to school”.*

*Focus Group Members, Zambia.*

### **Women's effective participation in decision-making**

Limited data were obtained in the study on women's participation in household decision-making. The interviews indicated that land use decisions in both Zambia and Malawi by single, divorced or widowed women were made primarily by themselves whereas in the case of married women they were either made jointly or by their partner. A broader view of changes in the decision-making ability of women respondents is provided by the Ladder of Power and Freedom tool (Muñoz-Boudet et al., 2013) which is used as a general indicator of changes in the overall degree of agency of respondents. The tool uses five predefined steps ranging from “no power to make decisions” to the “ability to make almost all major decisions” in their lives. Women respondents were asked to situate themselves on the scale both now (2014) and ten years previously. Responses of the 17 respondents (9 from Zambia, 8 from Malawi) are shown in Figure 6.

Steps 1 and 2 on the scale represent only a very small degree of power or none at all. Step 3 represents the ability to make a few major life decisions and steps 4 and 5 the ability to make many or all major life decisions. Using this measure some 58% of respondents showed an increase in their degree of empowerment. Six



**Figure 6.** Changes in the ladder of power and freedom of Women in Zambia and Malawi Villages.

six (35% - 2 Zambia, 4 Malawi) the ability to make many or all major life decisions.

**Conclusion**

The Empowerment component of the framework discussed in this paper covered the woman’s ownership of assets, access to formal and informal credit, decisions regarding production and household income and membership in social and economic groups. Some female respondents reported improvement in their household’s ownership of assets in the form of land, livestock and housing as a result of project activities although the role of the woman in making these specific decisions was not clear. Although there is no use of formal credit institutions in the communities, there was clear evidence of increased use of VSL groups by women in the villages and indications that some women were able to independently access loans from them both for home improvements and small business initiatives. The final element of the Empowerment Component, and an aspect considered significant in the literature, was the woman’s ability to make or contribute to household and

production related decisions (Kabeer, 1999). In general terms, based upon the limited range of information generated from interviews, single, divorced or widowed women appeared to have gained more control over their circumstances than those who were married. However, the Ladder of Power and Freedom measure of agency indicated that only three of the seventeen (17.65%) respondents remained in the “least powerful” category. The remainder displayed at least some modest improvement in ability to make important decisions in their households with five (29.41%) showing quite considerable improvement. The overall results indicate that improvements in women’s economic condition, health and nutrition have occurred during the course of the Project however, improvements in the level of empowerment remain for the most part modest (FAO, 2011).

The paper acknowledges that the impacts of the project on women using the expanded “CARE” framework are more difficult to evaluate. In terms of the Health, Economic and Social Well-being Component, all of its elements including woman’s food security, nutrition, physical health, productivity/ profitability and social well-being appear to show modest improvements over the

previous ten years. However, data limitations and the fact that the Project built upon previously initiated activities in the villages make it impossible to attribute these changes exclusively to the MIRACLE project.

Despite the limitations, this paper has sought to explore some aspects of the relationship between an agricultural project and its female participants. Although health and nutrition as well as the status of women in agriculture has received extensive attention in the literature in recent decades, a research gap still persists in explaining the interface between gender, health and nutrition and how interventions in health and nutrition can contribute to improving gender equity in countries and contexts where the beneficiaries are primarily survivors of HIV/Aids or other similar types of pandemics and livelihood challenges. This paper has made an attempt to contribute to this effort.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interest

## ACKNOWLEDGEMENTS

The authors gratefully thank all the IITA project stakeholders, key informants, community members and IITA staff who freely provided information and insights for this study. We are grateful for the facilitation and support provided by the Director IITA Southern Africa Dr. David Chikoye, IITA Communication Office (Bode, Jeffrey Oliver and Catherine Njuguna), Tundu Kaonga, Senior Agriculture Officer in Kazungula district in Zambia and Benedicto Kanyika in Malawi throughout the study.

## REFERENCES

- Alkire S, Meinzen-Dick RA, Peterman A, Quisumbing AR, Seymour G, Vaz A (2013). The Women's Empowerment in Agriculture Index. *World Development* 52:71-79. <https://doi.org/10.1016/j.worlddev.2013.06.007>.
- Badstue L, Kantor P, Prain G, Ashby J, Petesch P (2014). Innovation and Development through Transformation of Gender Norms in Agriculture and Natural Resource Management: A Global Comparative Research Initiative. Unpublished manuscript.
- Baylies C (2002). The impact of AIDS on rural households in Africa. A shock like any other. *Development and Change*. 33(4):611-632. DOI: 10.1111/1467-7660.00272.
- CARE (2013a). CARE pathways push-pull operational framework. CARE. Atlanta, GA. <http://www.care.org/sites/default/files/documents/AG-2013-Innovation-Brief-Operational-Framework-Pathways.pdf>; Accessed 24 March 2016.
- CARE (2013b). CARE pathways farmer field and business school brief. Innovation brief. CARE. Atlanta, GA: [http://www.care.org/sites/default/files/documents/ffbs\\_innovation\\_brief.pdf](http://www.care.org/sites/default/files/documents/ffbs_innovation_brief.pdf); Accessed 24 March 2016.
- Chapoto A, Jayne TS (2008). Impact of AIDS-related mortality on farm household welfare in Zambia. *Economic Development and Cultural Change* 56(2):327-374. DOI: 10.1086/522894
- Dawson H (2013). HIV/AIDS, the erosion of social capital and the collapse of rural livelihoods in the Nkomazi district of South Africa. *African Journal of AIDS Research* 12(4):185-194. doi: 10.2989/16085906.2013.863218.
- Deere CD, Twyman J (2012). Asset Ownership and Egalitarian Decision Making in Dual-headed Households in Ecuador. *Review of Radical Political Economics*, Union for Radical Political Economics 44(3):313-320.
- Doss C (2013). Intra-household bargaining and resource allocation in developing countries. Policy Research Working Paper 6337. World Bank. Washington DC: <http://library1.nida.ac.th/worldbank/fulltext/wps06337.pdf>. Accessed 7 May 2016.
- Doss C, Kovarik C, Peterman A, Quisumbing A, van den Bold M (2015). Gender inequalities in ownership and control of land in Africa: Myth and reality. *Agricultural Economics* 46(3):403-434. DOI: 10.1111/agec.12171
- Drimie S (2002). The impact of HIV/AIDS on rural households and land issues in Southern and Eastern Africa. A Background Paper prepared for the Food and Agricultural Organization, Sub-Regional Office for Southern and Eastern Africa. <http://www.fao.org/wairdocs/ad696e/ad696e00.htm>. Accessed 15 May 2016.
- Dzanja JL, Christie M, Fazey I, Hyde T (2013). The role of social capital on rural food security: the case study of Dowa and Lilongwe Districts in Central Malawi. *Journal of Agricultural Science* 7(12):165-176. doi:10.5539/jas.v7n12p165.
- Ellis-Jones J, Gondwe T (2013). Linking innovations systems with participatory research and extension: MIRACLE experiences from southern Africa. *Agriculture for Development* 18:13-17.
- Farnworth CR, Fones Sundell M, Nzioki A, Shivutse V, Davis S (2013). Transforming gender relations in agriculture in Sub-Saharan Africa. Stockholm: Swedish International Agricultural Network Initiative (SIANI). <https://www.sei-international.org/mediamanager/documents/Publications/SIANI-Gender-Africa-book/SIANI-2013-Transforming-Gender-Relations-highres-FULL.pdf>. Accessed 10 June 2016.
- FEWS Net (2014). Zambia Livelihood zones and descriptions. FEWS Net. Washington DC: [http://www.fews.net/sites/default/files/documents/reports/ZM\\_LZ\\_descriptions\\_2014\\_0.pdf](http://www.fews.net/sites/default/files/documents/reports/ZM_LZ_descriptions_2014_0.pdf). Accessed 24 May 2016.
- Fletcher D, Kenney L (2011). Rural women's access to financial services, credit, savings and insurance. *Gender in agriculture pp.* 187-208.
- Food and Agriculture Organization (FAO) (2003). Incorporating HIV/AIDS considerations into food security and livelihoods projects. Rome: Food and Agriculture Organization of the United Nations <http://www.fao.org/docrep/004/Y5128E/Y5128E00.htm>. Accessed 10 June 2016.
- Food and Agriculture Organization (FAO) (2008). An introduction to the basic concepts of food security. [www.foodsec.org/docs/concepts\\_guide.pdf](http://www.foodsec.org/docs/concepts_guide.pdf). Accessed 10 June 2016.
- Food and Agriculture Organization (FAO) (2011). Women in Agriculture. Closing the gender gap for development. In: *The State of Food and Agriculture*. FAO. Rome. Accessed 10 June 2016
- Fox MP, Mazimba A, Seidenberg P, Crooks D, Sikateyo B, Rosen S (2010). Barriers to initiation of antiretroviral treatment in rural and urban areas of Zambia: A cross-sectional study of cost, stigma and perceptions about ART. *Journal of the International AIDS Society* 13(8):8-8. doi: 10.1186/1758-2652-13-8.
- Ganyaza-Twalo T, Seager J (2005). Literature review on poverty and HIV/AIDS: Measuring the social and economic impacts on households. Unpublished paper, Human Sciences Research Council, Cape Town, South Africa. Retrieved from <http://www.sahara.org.za/index.php/activities/poverty-project.html>
- Gross R, Schoeneberger H, Pfeifer H, Preuss HJ (2000). The four dimensions of food and nutrition security: Definitions and concepts. *SCN News* 20(20):20-25.
- Haddad L, Gillespie S (2001). Effective food and nutrition policy responses to HIV/AIDS: What we know and what we need to know. FCND Discussion Paper No 112. Washington DC: International Food Policy Research Institute. <http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/76110>.

- Accessed 7 July 2016.
- Harsmar M (ed) (2006). *Agricultural development in Sub-Saharan Africa. Workshop Proceedings.* Stockholm: Expert Group on Development Issues, Ministry for Foreign Affairs. Stockholm, Sweden.
- Hejase AJ, Hamie I, Hejase HJ (2020). The Gender Wage Gap within the Agricultural Sector: A Case from South Lebanon. *Journal of Business Theory and Practice* 8(4):32. <http://dx.doi.org/10.22158/jbtp.v8n4p32>
- Hejase AJ, Hejase HJ, Hejase, HA (2015). Gender Wage Gap in Lebanon: Explorative Analysis. *Journal of Applied Economics and Business Research* 5(1):1-19.
- Hindin M (2005). Women's autonomy status and nutrition in Zimbabwe, Zambia and Malawi. in USAID (ed.) *A Focus on Gender. Collected Papers on Gender Using DHS Data.* 93-116. Calverton Maryland USA: ORC Macro. [http://pdf.usaid.gov/pdf\\_docs/pnade016.pdf#page=99](http://pdf.usaid.gov/pdf_docs/pnade016.pdf#page=99). Accessed 28 May 2016. <http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/127909>
- IITA (2010). *Making Agricultural Innovations Work for Smallholder Farmers Affected by HIV/AIDS in Southern Africa.* Proposal submitted to HIV/AIDS Regional Team for Africa National Programme Officer Regional Advisor: Food Security / Human Rights. Unpublished document. Accessed 28 May 2014.
- Kabeer N (1999). Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment. *Development and Change* 30(3):435-64.
- Kabeer N (2001). Reflections on the Measurement of Women's Empowerment. *Discussing Women's Empowerment: Theory and Practice.* SIDA Studies (3):17-57.
- Kabeer N (2012). Women's Economic Empowerment and Inclusive Growth; Labour markets and enterprise development. SIG Working Paper 2012/1. IDRC, Ottawa.
- Kassie M, Stage J, Teklewold H, Erenstein O (2015). Gendered food security in rural Malawi: why is women's food security status lower. *Food Security* 7(6):1299-1320. DOI 10.1007/s12571-015-0517-y
- Lewden C, Chene G, Morlat P, Raffi F, Dupon M, Dellamonica P, Pellegrin JL, Katlama C, Dabis F, Lepout C; Agence Nationale de Recherches sur le Sida et les Hepatites Virales (ANRS) CO8 APROCO-COPILOTE Study Group; Agence Nationale de Recherches sur le Sida et les Hepatites Virales (ANRS) CO3 AQUITAINE Study Group (2007) HIV-infected adults with a CD4 cell count greater than 500 cells/mm<sup>3</sup> on long-term combination antiretroviral therapy reach same mortality rates as the general population. *Journal Acquired Immune Deficiency Syndrome.* 46(1):72-77. doi: 10.1097/QAI.0b013e318134257a. PMID: 17621240.
- Lunde T (2009). *Escaping Poverty: Perceptions from Twelve Indigenous Communities in Southern Mexico.* Dissertation submitted to Johns Hopkins University, Baltimore for the Degree of Doctor of Philosophy. University Microfilms 329 p.
- Maize for reducing Protein-Energy Undernutrition (A Review. *African Crop Science Journal* 25(4):521-537. Based on a work at [www.ajol.info/](http://www.ajol.info/) and [www.bioline.org.br/cs](http://www.bioline.org.br/cs). DOI: <http://dx.doi.org/10.4314/acscj.v25i4.9>
- Malawi National Vulnerability Committee (2005). *Malawi Baseline Livelihood Profiles Version 1.* [http://pdf.usaid.gov/pdf\\_docs/Pnagd538](http://pdf.usaid.gov/pdf_docs/Pnagd538). Accessed 2 December 2016.
- Malhotra A (2003). Measuring empowerment at the national level: An economist's perspective. In Narayan D. (Ed.). *Measuring Empowerment: Cross-Disciplinary Perspectives.* (Washington DC, The World Bank) pp. 267-284.
- Malhotra A, Schuler S, Boender C (2002). *Measuring Women's Empowerment as a Variable in International Development.* Background paper prepared for the World Bank workshop on poverty and gender: New perspectives (Vol. 28).
- Mbonu NC, Van den Borne B, De Vries NK (2009) Stigma of people with HIV/AIDS in Sub-Saharan Africa: A literature review. *Journal of Tropical Medicine* <http://dx.doi.org/10.1155/2009/145891>
- Meinzen-Dick RS, Johnson N, Quisumbing A, Njuki J, Behrman J, Rubin D, Peterman A, Waitanji E (2011). Gender, Assets, and Agricultural Development Programs: A Conceptual Framework. CAPRI Working Paper No. 99. International Food Policy Research Institute: Washington, DC.
- Mhango S, Mpama L, Mkangara C, Soka D, Panigrahi R, Kwilasa M, Attiah G, Eliasu A, Coulibay M, Fame I, Sidira F, Nakuti J, Maravanyika O, Chikavanga A (2015). Designing a common gender indicator framework for CARE's Pathways Program. CARE, Atlanta, Georgia USA. <http://www.fsnnetwork.org/sites/default/files/53%20-%20FINAL%20to%20printer%20-%20Gender%20indicator%20design%20WORKSHOP%20REPORT-%20APRIL%202013.pdf>. Accessed 6 March 2016.
- Miruka M, Hillenbrand E (2016). Theorizing Women's Empowerment in Agriculture. In: Steiner R, and Hanks D (Eds), *Harnessing the Power of Collective Learning.* Routledge, London, pp. 131-145.
- Molloy E, Asimenye C, David M (2016), *Gender Analysis of Village Savings and Loans. Enhancing Community Resilience Programme (ECRP), UKaid, Irish Aid & Norwegina Embassy.*
- Muñoz Boudet AM, Petesch P, Turk C, Tumala A (2013). *On Norms and Agency : Conversations about Gender Equality with Women and Men in 20 Countries.* Directions in development: human development. World Bank, Washington, DC: <https://openknowledge.worldbank.org/handle/10986/13818> License: CC BY 3.0 IGO.
- Mutangadura GB, Sandkjaer B (2009). Mitigating the Impact of HIV and AIDS on Rural Livelihoods in Southern Africa. *Development in Practice* 19(2):214-226. DOI: 10.1080/09614520802689477 R
- Ng'ambi C, Dzanja J, Mwase W (2015). Rural Farming Households Vulnerability to Climate Variability in Malawi: A Case of Chitekwere Area Development Programme (ADP) in Lilongwe District. *Journal of Agricultural Science* 7(7):93. DOI: <http://dx.doi.org/10.5539/jas.v7n7p93>
- Njuki J, Kruger E, Starr L (2013). Increasing the Productivity and Empowerment of Women Smallholder Farmers. Results of a Baseline Assessment from Six Countries in Africa and Asia. CARE USA: Atlanta, Georgia: 24pp <http://www.care.org/sites/default/files/documents/pathways-global-baseline-report-2013.pdf>. Accessed 21 July 2016.
- Nyakurwa CS, Gasura E, Mabasa S (2017). Potential for Quality Protein Panagides D, Graciano R., Atekyereza P, Gerberg L, Chopras M (2007). A review of nutrition and food security approaches in HIV and AIDS programmes in Eastern and Southern Africa. *Discuss Paper* 48:1.
- Parker DC, Jacobsen KH, Komwa M (2009). A Qualitative Study of the Impact of HIV/AIDS on Agricultural Households in Southeastern Uganda. *International Journal of Environmental Research and Public Health* 6(8):2113-2138. doi: 10.3390/ijerph6082113
- Putnam RD, Leonardi R, Nanetti R (1994). *Making Democracy Work. Civic traditions in modern Italy.* Princeton University Press. Princeton, NJ.
- Quisumbing AR, McClafferty B (2006). Using gender research in development. *Food Security in Practice Technical Guide Series 2.* Washington, D.C.: International Food Policy Research Institute (IFPRI). <http://dx.doi.org/10.2499/0896297551>
- Samuels AF, Naomi R (2011). Health regains but Livelihoods lag: findings from a study with people on ART in Zambia and Kenya. *Journal of Psychological and socio-medical Aspects of AIDS/HIV* (23)6:48-754.
- Sitko NJ, Chapoto A, Kabwe S, Tembo S, Hichaambwa M, Lubinda R, Ciwawa H, Mataa M, Heck S, Nithani D (2011). Technical Compendium: Descriptive Agricultural Statistics and Analysis for Zambia in Support of the USAID Mission's Feed the Future Strategic Review. No 104016, Food Security Collaborative Working Papers, Michigan State University, Department of Agricultural, Food, and Resource Economics. [ageconsearch.tind.io/record/104016](http://ageconsearch.tind.io/record/104016). Accessed 3 January 2017.
- Tsai AC, Bangsberg DR, Weiser SD (2013). Harnessing Poverty Alleviation to Reduce the Stigma of HIV in Sub-Saharan Africa. *PLoS Medicine* 10(11):e1001557. doi:10.1371/journal.pmed.1001557
- Tschirhart N, Kabanga L, Nichols S (2015). The Convergence of HIV/AIDS and customary tenure on women's access to land in rural Malawi. *SAHARA-J: Journal of Social Aspects Of HIV/AIDS* 12(1):134-146. doi: 10.1080/17290376.2015.1124049.

- UNAIDS (2008). HIV, Food Security and Nutrition: Policy Brief-Expanded Version. Geneva: UNAIDS. [http://www.unaids.org/sites/default/files/media\\_asset/jc1565\\_policy\\_brief\\_nutrition\\_long\\_en\\_1.pdf](http://www.unaids.org/sites/default/files/media_asset/jc1565_policy_brief_nutrition_long_en_1.pdf). Accessed 3 September 2016.
- Waller MK (2014). Empowering Women through Saving groups: A Study from the Wellness and Agriculture for Life Advancement (WALA) Program, CRS.
- Weiser SD, Young SL, Cohen CR, Kushel MB, Tsai AC, Tien PC, Hatcher AM, Frongillo EA, Bangsberg D (2011). Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDS. *American Journal of Clinical Nutrition* 94(6):1729-1739. doi: 10.3945/ajcn.111.012070
- Whitehead A, Kabeer N (2001). Living with Uncertainty: Gender, Livelihoods and pro-poor growth in Rural Sub-Saharan Africa. IDS Working Paper 134, Brighton: Institute of Development Studies. <http://www.ids.ac.uk/files/Wp134.pdf>. Accessed 24 October 2016.
- World Health Organization (WHO) (2002). The World Health Report 2002. Reducing Risks, Promoting Healthy Life. Geneva: World Health Organization. [http://www.who.int/whr/2002/en/whr02\\_en.pdf?ua=1](http://www.who.int/whr/2002/en/whr02_en.pdf?ua=1). Accessed 30 October 2016.