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## ABSTRACT

This study investigates the impact of introducing participatory intrahousehold decision-making on the empowerment of women in agricultural households in sub-Saharan Africa, particularly in Ugandan coffee farming households. Participatory intrahousehold decision-making is expected to empower women through increasing their voice and lifting collective action problems, which otherwise compromise efficiency and equity of the household farm. With a mixed methods approach this study captures the impact on multiple dimensions of empowerment, including women's perceptions of the process, meaning and value.

Women portrayed three possible pathways towards empowerment in their household: "Breaking through the wall of patriarchy" – the preferred pathway but conditional on being married to a cooperative husband - "Circumventing" it, or having "No choice but to take full responsibility" in case of husbands who are ill or migrant workers.

On the basis of a randomized encouragement of couples to participate in an intervention introducing participatory intrahousehold decision-making, we quantitatively demonstrated the catalyzing effects on different domains of women's empowerment, including involvement in strategic household decisions, women's control over household income, personal income and assets. Women's decision-making power about cash crop production, another strategic domain that women value, increased to some extent. These impacts support women in following a pathway to empowerment by "Breaking through the wall of patriarchy", but are also valuable for women for whom that pathway is out of reach.

Policies and programmes introducing participatory intrahousehold decision-making have the potential to empower women in domains they value and should be combined with effective ways to accomplish women's wish to gain economic power to actively contribute to the development of their household.

## 1. INTRODUCTION

Agricultural production in sub-Saharan Africa, including East Africa, is characterized by smallholder household farming and does not score high in terms of efficiency or sustainability. Additionally, there is increasing evidence of inequality. Significant gender productivity gaps are observed within household farms, in part linked to imbalanced intrahousehold allocation of time and resources (e.g. Ayalew, Bowen, Deininger, & Duponchel, 2015). At the same time, there is overwhelming evidence of intrahousehold inequalities with regard to expenditure, health care, nutrition and resource allocation that disadvantage women (Quisumbing & Maluccio, 2000). While a multitude of challenges at different institutional levels encumber sustainable, efficient and equitable outcomes of household farming, it is increasingly acknowledged that some of the challenges are situated at the level of the household (Doss & Meinzen-Dick, 2015).

Inequalities linked to gender and limited women's empowerment in rural societies are not only undesirable from a human rights perspective, they also encumber future sustainable agricultural production, economic growth, and poverty reduction (Goh, 2012; World Bank, 2012). Given the positive impacts of women's empowerment on investments in children's health and human capital, limited empowerment of women undermines the potential of future generations and contributes to gender inequalities persevering across generations (World Bank, 2012).

This research explores to what extent the introduction of a more participatory way of intrahousehold decision-making, in which spouses consult each other and decide together, increases women's empowerment in agricultural households. It studies the case of smallholder coffee farming households in central Uganda.

This article is structured as follows. In section 2, the literature dealing with intrahousehold decision-making in households and with women's empowerment is reviewed. Section 3 describes the context and more specially the intervention under study. In section 4 the mixed quantitative and qualitative methods are discussed. This is followed by the presentation of findings on women's valuation of different dimensions of empowerment in their household; their perceptions of the process towards empowerment in their household; the impact of introducing participatory intrahousehold decision-making on different dimensions of women's empowerment; and how these effects fit into women's own strategies for empowerment.

## 2. LITERATURE REVIEW

### 2.1. Agricultural households and intrahousehold bargaining

Insights into intrahousehold challenges in agricultural households are essential parts of the puzzle to achieve agricultural development that is not only sustainable and efficient, but also gender equitable. In a household farm system, the prevailing farm organization in sub-Saharan Africa, the household makes interrelated decisions about (investments in) production and consumption of the resources (re)generated through the household farm (Morduch, 2005). As each household member has his/her own utility function with different preferences and different abilities to impact outcomes, there will be bargaining between household members (Alderman, Hoddinott, Haddad, & Udry, 2003; Doss & Meinzen-Dick, 2015). The weight of household members' decisions about production and consumption will depend on their relative bargaining power, as will the distribution of costs and benefits (Agarwal, 1997; Doss, 2013).

There is substantial evidence that intrahousehold bargaining does not necessarily lead to cooperative solutions (e.g. Iversen, Jackson, Kebede, Munro, & Verschoor, 2011; Fiala & He, 2017, Munro, 2017) and that the distribution of benefits in cooperative – and non-cooperative – outcomes is not necessarily equitable across household members (e.g. Goldstein and Udry 2008: in Doss, 2013; Duflo & Udry 2004: in Doss, 2013; Doss 2006: in Doss, 2013; Fiala & He, 2017). To understand why some agricultural households fail to reach cooperative and equitable outcomes Doss and Meinzen-Dick (2015) suggest to conceptualize the household farm system as a common pool resource (CPR) from which exclusion is difficult and the consumption of resource units derived from the CPR is rival (Ostrom, 1990). In parallel with users of CPR, agricultural households can be considered a group of users of a common household farm system seeking provision- i.e. sustaining the common resource system by ensuring a supply of resource units - through (agricultural) production. Resources and benefits generated through the common household farm system are distributed across its members, like CPR users appropriate resource units. As in CPR settings, inefficiencies can arise from the fact that individual household members are tempted to underinvest in agricultural production because they would individually bear the costs but only (expect to) receive a share of the benefits (*provision dilemma*), or from the fact that individual household members may overconsume and deplete the household farm resources because they can individually benefit while bearing only a portion of the costs related to overuse (*appropriation dilemma*). This can compromise sustainability and equity and, in turn, generate a disincentive to invest in the common farm (Doss & Meinzen-Dick, 2015; Ostrom, 1990).

A key insight into CPR governance is that cooperative outcomes are possible with appropriate 'rules of the game' or 'institutions' (Ostrom, 1990).<sup>1</sup> Appropriate rules of the game can counter the provision and appropriation dilemmas by altering the users' incentives and are typically based on trust, (reciprocity) norms and mutual commitment (Cardenas & Carpenter, 2008; Ostrom, 1990). The CPR literature demonstrated that cooperation and rule compliance are more likely in case of limited power imbalances between users and when everyone can participate effectively in the rule- and decision-making process (Agrawal, 2001; Doss & Meinzen-Dick, 2015).

In sub-Saharan household farming systems it is unlikely that every household member can effectively participate in rule- and decision-making and that intrahousehold power relations are balanced. Particularly women's intrahousehold negotiation positions may be rela-

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[1] We conceptualize 'rules of the game' as regularized patterns of behavior that shape human interaction and that are moulded by people's practices, underlying structures and sets of formal and informal rules in use (Clever, 2002).

tively weak in this context. Their position depends on their – de jure and de facto - access to private and common productive assets, income earning means, as well as social and external support systems (Agarwal, 1997), which, in rural societies in sub-Saharan Africa, are subject to gender-ascribed constraints rooted in patriarchal norms, rules and customs (Kabeer, 2015). Gender skewed social perceptions, for instance, may imply a systematic undervaluation of women's contributions to the household's (re)production and an underestimation of her needs. Social norms can set limits to what can be negotiated by women and how this can be done (Agarwal 1997).

In recognition of the presence of collective action problems and power imbalances in agricultural households, Doss and Meinzen-Dick (2015) point out that it is worth investigating whether more participatory household decision-making could contribute to greater cooperation and equitable sharing of resources and benefits in agricultural households. Promoting participatory household decision-making could lift information asymmetries between household members and strengthen women's voice in rule- and decision-making, all of which may be beneficial for cooperation and equity.

## **2.2. Participatory intrahousehold decision-making and women's empowerment**

In this study we are particularly interested in the potential of participatory intrahousehold decision-making for equitable household farming, thus in its potential to contribute to gender equity and empowerment of women in agricultural households. The way in which the promotion of participatory intrahousehold decision-making contributes to women empowerment differs from interventions that focus on strengthening women's bargaining power by increasing their access and control over resources, for instance by the promotion of income generating activities (IGA). Other interventions aim to increase women's agency through awareness raising, education, and group membership, albeit revolved around IGA. The promotion of participatory intrahousehold decision-making fits into interventions that aim to directly change decision-making processes within the household by strengthening women's voice and facilitating women to build their bargaining power by increasing their share of and control over household resources.

The hypothesis is that, by promoting participatory household decision-making, household members will contribute more, and more equal shares to the common household farm, act less opportunistically and consume household resources in a more sustainable and equitable manner. This is expected because household members, and especially spouses, are better informed about the household's investment and expenditure needs, about each other's contributions to farm production and about each other's consumption from the household income. In turn, the experience of less opportunistic provision and consumption is expected to strengthen incentives for cooperative behavior; as does more involvement in rule and decision-making (Agarwal, 2001; Doss & Meinzen-Dick, 2015). Finally, while in patriarchal societies, women have limited voice and influence in intrahousehold decision-making by introducing participatory intrahousehold decision-making, spouses are encouraged to communicate and make decisions in correspondence with each other. This implies the voice and influence of women in intrahousehold decision-making will be greater. Hence, inequitable outcomes are expected to be less likely as women participate more effectively in intrahousehold rule- and decision-making (Agarwal, 1997).



### 2.3. Defining women's empowerment

Empowerment is a debated concept and has been operationalized in many different ways by different authors in different contexts (Ibrahim & Alkire, 2007). We follow the widely accepted definition of Kabeer (1999) and define empowerment as *a process of change where people acquire the ability to make strategic life choices*. Though simple, this definition captures a number of essential elements which need to be taken into account in any measurement efforts.

First of all, empowerment should be seen as a *process*, where women actively progress from a state of gender inequality and disempowerment to a state of greater equality. This dynamic element distinguishes empowerment from static concepts such as autonomy (Jejeebhoy & Sathar, 2001), but also complicates its measurement. The time period over which this process should be monitored is unpredictable and will depend on the nature and extent of the intended changes (Doss, 2013; Malhotra, Schuler, & Boender, 2002).

Secondly, empowerment refers to *strategic life choices*, not day-to-day household decisions which have insignificant consequences for people's lives. Policies that increase women's authority or efficiency within domains which were already assigned to them do not lead to empowerment. The choices women are enabled to make need to carry the potential to challenge existing power relations and transform women's position within the household and society (Kabeer, 2005).

As a third point, the concept of choice necessarily implies the *possibility of alternatives*. These alternative ways of 'being and doing' need to be real possibilities, not just materially but also within people's minds. In patriarchal societies, women have often internalized their position of lesser value, adapted their preferences and do not find traditional gender roles unjust (Malhotra, Schuler, & Boender, 2002; Sen, 1990). There are many examples of gender inequality which appear to be chosen by the women themselves, even though these choices undermine the women's own well-being (e.g. Kabeer, 2001; Shaffer, 1998). Thus, the process of empowerment requires an inner transformation from unquestioned acceptance of the existing situation to critical consciousness, where women become able to "at least imagine the possibility of choosing differently" (Kabeer, 1999: 441).

Finally, empowerment includes social, economic, political, and psychological dimensions and operates in the different arenas (or "spheres") of the household, village, and larger society (Ibrahim & Alkire, 2007; Malhotra, Schuler, & Boender, 2002). Women may be empowered in their private roles as wives or mothers within the sphere of the household, while still experiencing large gender gaps in their public roles as farmers, business partners, or village representatives (e.g. Alkire, 2008). In the larger community sphere, collective solidarity and mutual support of women is crucial to achieve structural change.

### 2.4. Measuring women's empowerment

Measuring empowerment deserves its own extensive literature review which lies beyond the scope of this work and for which we refer to e.g. Malhotra, Schuler, and Boender (2002), Ibrahim & Alkire (2007) or Narayan (2005), and references therein. The measurement of the complex and multi-dimensional concept of empowerment can be facilitated by breaking it down in terms of the three inter-related dimensions of *resources* (pre-conditions), *agency* (the process of decision-making) and *achievements* (the outcomes of the choices made) (Kabeer, 1999) (visualized in Figure 1). In recognition of the multi-dimensional aspect of empowerment, many authors have constructed aggregate indicators capturing a number of different dimensions (e.g.

Alkire, Meinzen-Dick, Peterman, Quisumbing, Seymour, & Vaz, 2013; Ibrahim & Alkire, 2007).

Resources can broadly be seen as ‘enabling factors’ for empowerment. They extend beyond the purely economic and material level of ‘assets’ to include human and social resources which can enhance women’s ability to make decisions, such as education and social status. However, access to resources only determines the potential for choice, it does not suffice to overcome patriarchal systems of control at the household and community level which inhibit women from realizing this potential into actual choice (Kabeer, 1999; Kabeer, 2001; Garikipati, 2008). There is even a danger of negative effects when additional resources cause jealousy and mistrust (Majurin, 2012) or reduce husbands’ feeling of responsibility to provide for the household (Mayoux, 2001).

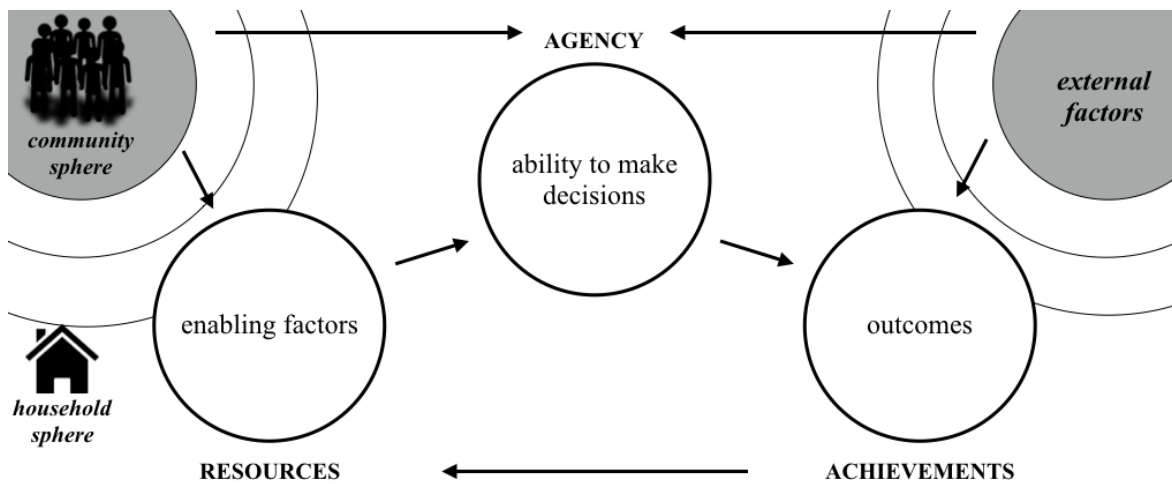
Achievements are the outcomes of the ability to make decisions. At the community level, women’s empowerment is often equated with national levels of political representation, legal rights or economic reform (Malhotra, Schuler, & Boender, 2002). Freedom of mobility and group membership are commonly measured achievements at the village level. At the individual or household level, studies often look at fertility, children’s health and education, and the incidence of domestic violence. Yet the use of achievements to indicate empowerment holds a number of caveats. First of all, outcomes of the ability to make choices are often difficult to untangle from resources, the pre-conditions that determine this ability. Secondly, the validity of achievement indicators depends on how well they capture changes in gender inequality within households and communities rather than overall increases in living standards or well-being (Kabeer, 2001). And finally, empowerment should focus on achievements valued by the women themselves, rather than by the researchers or policymakers in charge of the evaluation (Kabeer, 1999). Women might prefer to invest their increased agency in strengthening the household unit rather than gaining more independence from it, since this is neither socially accepted nor the women’s own desire (Kabeer, 1999). Here it becomes tricky to differentiate with mental conditioning and the extent to which this desire is in fact intrinsic or an external expectation which has been internalized. Aside from these caveats, many achievement indicators are relatively easy to measure and therefore widely available.

Many authors agree that agency is the essence of women’s empowerment (e.g. Malhotra, Schuler, & Boender, 2002). Agency refers to the ability to define one’s goals and act upon them (Kabeer, 1999) and is most often operationalized as decision-making on various domains (e.g. Mabsout and Staveren, 2010). However, as an indicator of empowerment, one needs to carefully choose which decisions to focus on. Strategic life choices are relatively infrequent in women’s lives and are often necessarily replaced by a (weighted) combination of observable smaller day-to-day decisions (Kabeer, 1999; 2005). Furthermore, agency is both an absolute concept – e.g. to what extent is a woman able to make decisions about household expenditures – and a relative one – e.g. does she have as much decision-making power over household expenditures as compared to the men in her household (Hanmer & Klugman 2016)?

Women’s ‘sense of agency’- the meaning and purpose they themselves give to their actions and decisions- constitutes the psychological dimension of empowerment. It is often neglected, even though its fundamental importance directly follows from the inherent subjectivity of the empowerment concept (Kabeer, 1997; 1999). A number of qualitative studies of microfinance programs have provided valuable insights into gender inequality and empowerment ‘as a lived experience’ (Kabeer, 2001: 68) and report a.o. an enhanced sense of self-worth, a new identity as valued contributors to the household, renewed respect in the eyes of their husbands,

and more acceptance and inclusion within the community as effects which are greatly valued by the women themselves (Kabeer, 2001; Hunt & Kasynathan, 2001). Attempts to quantify this anecdotal evidence on the psychological dimension of empowerment have so far been limited.

**Figure 1: Women's empowerment as a multi-dimensional concept**



## 2.5. Research questions

This study responds to the challenge identified by Doss and Meinzen-Dick (2015) to investigate if a more participatory mode of intrahousehold decision-making, in which spouses communicate better and make decisions in correspondence with each other, contributes to greater gender equality and the empowerment of women in agricultural households through lifting collective action problems and enhancing women's voice. It addresses the challenge set by Kabeer (1997) to include in the measurement of the multi-dimensional concept of empowerment women's perceptions of their empowerment process, of the sources of their agency and sense of power, and the value and meaning they assign to empowerment.

This mixed method study will address the following research questions: 1) What meaning and value do women assign to different dimensions of empowerment in their household?; 2) How do women perceive their process towards empowerment in their household?; 3) What is the impact of introducing participatory intrahousehold decision-making on different dimensions of women's empowerment?; and 4) How do the effects of the introduction of participatory intrahousehold decision-making fit into women's own strategies for empowerment in their households?

The article proceeds as follows. Section 3 provides a description of the gender household approach of the Hanns R. Neumann Stiftung (HRNS) through which participatory intrahousehold decision-making is randomly introduced in smallholder coffee farming households in central Uganda. Section 4 describes the mixed method approach to evaluating its impact on women's empowerment. Section 5 presents our results with discussion and we conclude in Section 6.

### **3. CONTEXT: SMALLHOLDER COFFEE FARMING HOUSEHOLDS IN UGANDA AND THE HANNS R. NEUMANN STIFTUNG GENDER HOUSEHOLD APPROACH**

This study concentrates on smallholder coffee farming households spread over five districts in the Masaka region of central Uganda. Agricultural production on the household farm typically comprises food crops for household consumption, of which excess harvests are sold, as well as some cash crops (mostly coffee) for marketing. The household farm system comprises of productive resources such as land, labor, financial and other assets, from which agricultural produce and income are derived.

Qualitative work in the study area and findings from a pilot study confirm that decisions in farming households in this context are informed by patriarchal norms and customs (Lecoutere and Jassogne, 2017). Generally, men have a lot of decision-making power over the household farm's organization, over the allocation of land, labor, and money to invest in agricultural production, and over income earned through the household farm. These patriarchal customs not only limit women's voice but also preserve information asymmetry between spouses about each other's contributions and benefits. The fact that, at marriage, typically women move to their husband's village where in most cases he already owns land creates an initial imbalance which complicates women's weight in final decisions not only on the transfer, but also on the usage of the land.

All the households in this study produce Robusta coffee as a cash crop and are connected to the Hanns R. Neumann Stiftung (HRNS), an independent German non-profit foundation established in 2005 to sustainably improve the economic profitability and livelihoods of smallholder coffee farmers in 18 countries around the world through grass-roots projects (HRNS, 2016). HRNS works with the smallholder coffee farming households included in this study on different livelihood challenges. HRNS invites farmers to attend farmer field schools to learn best practices on profitable and sustainable farming and climate change mitigation, and encourages them to jointly market their coffee through producer organizations (PO) to increase their competitiveness. Additionally, the HRNS Gender Household Approach (GHA), which is implemented in selected regions, recognizes the importance of gender equality for the overall well-being of the coffee farming households and the need to address challenges to collective action at the intrahousehold level. Rather than solely targeting women in female headed households who have some level of control over land and are able to reap the benefits from coffee, HRNS' GHA also targets married women, for whom the challenges are different. The HRNS GHA does not aspire to empower women to become independent and manage on their own, but aims to promote coffee production as a family business where all members contribute and benefit equally from the household farm (HRNS, 2016).

The first step of the GHA is introducing PO leaders to the program and motivating them to mobilize their PO members to attend the second activity, couple seminars, as a couple. In the couple seminars, which take about 3 to 4 hours, the HRNS gender officer guides couples through a self-assessment of the current division of roles and responsibilities in their household and who has control over which household resources. Through enhanced awareness of the current gender imbalances, couples become motivated to introduce changes.

The third step consists of the Change Agent program, a package of activities intensively coaching couples on how to implement participatory intrahousehold decision-making. This is the intervention that has been randomly encouraged for this study among a random selection of monogamous couples participating in the couple seminars. First, the couples follow a

one-day workshop focused on putting participatory planning and decision-making into practice by drafting a joint household farm plan and budget. Secondly, the couples are mentored by the HRNS gender officer and receive a subsequent household visit to support the implementation of their farm and budget plans. Thirdly, women are invited to attend a women leadership training to increase their participation and representation in farmer groups. The fourth and final activity is a follow-up workshop in which couples share experiences and self-evaluate the coaching program.

As a final element of the GHA, the couples in the Change Agent program are stimulated to promote participatory intrahousehold decision-making and gender equality within their communities in order to create a positive spillover and widen the program's reach. For that purpose, HRNS also organizes drama shows in the communities.

## **4. METHODS**

### **4.1. A mixed methods approach**

To deal with the fact that women's empowerment is complex, multi-dimensional, dependent on an interplay of control over resources, agency and achievements, and needs to include the value and meaning women give to their actions and decisions, we adopted a mixed method approach (Greene, 2007). Our mixed method research strategy is a sequence of qualitative inquiry informing quantitative research then followed by a qualitative – partly participatory – interpretation of the quantitative results.

### **4.2. Quantitative data and method of analysis**

To evaluate the differential impact of the two stages of the HRNS Gender Household Approach - the couple seminars and the subsequent Change Agent program, through which participatory intrahousehold decision-making is introduced in smallholder coffee farming households, a randomized control trial (RCT) with three different groups was set up together with HRNS<sup>2</sup>.

The RCT targeted 29 couple seminars with 10-25 participating couples, organized for couples from 77 POs spread over five districts across the Masaka region. Out of the participating couples of each couple seminar, up to six randomly selected monogamous couples received encouragement through an invitation and a personal phone call by the HRNS gender officer to sign up for the Change Agent program.<sup>3</sup> These couples make up the *treatment group* (encouraged). Another random selection of up to six monogamous participant couples of each couple seminar were assigned to the first control group, *control-A* (non-encouraged). Comparison of treatment and control-A groups tells us the impact of the Change Agent program within a group of couples who attended a couple seminar. Since after encouragement couples cannot be forced to actually participate in the Change Agent program, nor can couples who did not receive encouragement but voluntarily signed up be excluded, the study has to take into account non-compliance from two sides. The external validity of the results is limited to the compliers, encouraged couples who choose to participate in the treatment and non-encouraged couples who comply to not

[2] The collaboration with HRNS limits the external validity of our results to coffee farming households who are members of the HRNS producer organizations. These households likely differ significantly in economic well-being from merely subsistence farmers. PO membership mostly serves the purpose of accessing agronomic trainings and improve pricing and marketing of individual coffee harvests. In case membership additionally correlates with more openness and flexibility towards new knowledge and ideas, this could also imply a more open disposition towards discussing and addressing gender roles and imbalances.

[3] We filtered out couples whom we knew to be polygamous at this stage. De facto, the sample still includes 7% polygamous couples. We control for that by matching (see further).

participating. Hence, we estimate local average treatment effects.

Control-C constitutes a second control group of monogamous couples randomly selected in five districts in the Masaka region where HRNS does not implement its GHA but conducts its normal agronomic trainings for the POs (as it does in the areas where the GHA runs). By comparing the treatment and control-C groups, we can evaluate the impact of the combination of having received the Change Agent program, the couple seminars, and the community drama shows. Comparison of control-A and control-C groups allows us to evaluate the combined impact of the couple seminars, the presence of couples who followed the Change Agent program as role models in the community, and the community drama shows.

At baseline, the individual surveys conducted separately with each of the spouses of the selected couples, took place immediately after the couple seminars (before the encouragement to participate in the Change Agent program) between November 2015 and July 2016. Endline interviews were done on average one year later from January to April 2017 in approximately the same order.<sup>4</sup> 748 respondents were interviewed at baseline, 74 of which (10%) were lost from the sample at endline due to attrition<sup>5</sup>. We have checked differential attrition of observed baseline characteristics to make sure the couples who drop out do not differ from the main sample, which would affect our assumption of perfect randomisation. Our analysis will be based on the cleaned sample of 674 respondents or 337 couples, which includes 153 treatment couples, 148 control-A couples and 36 control-C couples ([See Supplemental File 1](#) for an analysis of balance across treatment and control groups).

In the cleaned sample, five encouraged treatment couples chose not to participate in the Change Agent program, while eight non-encouraged control-A couples did participate. Out of a total of 301 treatment and control-A couples, this represents a very high level of 96% compliance. In our analysis, partial compliance is taken into account in a two-stage regression, where the random encouragement status  $Z$  is used as an exogenous instrumental variable (IV) for the endogenous treatment status  $T$ . We additionally use propensity score matching (PSM) with inverse probability of treatment weighting to control for initial conducive elements for women's empowerment (measured at baseline) that were qualitatively identified and could be operationalized (see Table 1 in Section 5.2. and Section 5.3.1.). The fact of controlling for initial conducive elements for women's empowerment means we actually look at the catalyzing effect of introducing participatory intrahousehold decision-making. We opted for PSM rather than regression analysis to control for these elements because it is a less parametric alternative for balancing the distribution of covariates across the groups that are compared (Li, Zaslavsky, & Landrum, 2013), while it saves degrees of freedom by controlling for the effect of multiple covariates reduced into one score (Cepeda, Boston, Farrar, & Strom, 2003).<sup>6</sup>

Two-stage IV regression combined with PSM using inverse probability weighting is also used for the comparison of the treatment and control-C groups. Here all control-C respondents complied with their encouragement status, since HRNS did not conduct any gender activities in their villages they could attend. Since these couples in the control-C group were not

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[4] The dataset and code is available on request. From October 2019 onwards, the dataset will be accessible through the institutional data repository of the University of Antwerp.

[5] Attrition dropped 40 respondents from the treatment group, 24 from control-A, and 10 from control-C. Lack of consent for the interview by the husband, wife, or both spouses was the main reason (84%), the remaining 16% attrition was due to sickness, old age, death, divorce, or relocation.

[6] With PSM observations on the margin may get little weight as it puts the emphasis on observations in different groups that are as similar as possible; whereas in regression analysis, that relies on minimizing the squared errors, observations on the margin may get a lot of weight (Blattman, 2010). Both PSM and regression analysis rely on assumptions that unobservable differences are absorbed by controlling for observable factors and do not bias results.



chosen from a group which self-selected to participate in a couple seminar, we cannot be certain they are statistically identical to the treatment and control-A groups. Apart from controlling for conducive elements for empowerment, the variables included in the PSM also control for the initial self-selection of treatment couples into a couple seminar. For the comparison of control-A and control-C groups, we use a single regression combined with the same PSM procedure. Finally, we also use this method to compare the combined treatment and control-A groups with the control-C group to increase statistical power.

The quantitative individual surveys to measure women's empowerment are inspired by the Women Empowerment in Agriculture Index (WEAI) (Alkire, Meinzen-Dick, Peterman, Quisumbing, Seymour, & Vaz, 2013) and cover the four domains of ownership (assets and income), decision-making (household and agricultural categories), group participation and time use. All questions refer as much as possible to specific situations or decisions to introduce face-validity and minimize the bias from socially desirable answering compared to more open questions on respondent's overall feelings of power or freedom (Holvoet, 2005; Hanmer & Klugman, 2016). Additionally, we asked respondents' perceptions about the evolution of their households' food security and well-being as a way to capture achievements at the household level. [Supplemental File 2](#) reports descriptive statistics for all outcomes analysed in Section 5.3.

#### **4.3- Qualitative data and method of analysis**

Since the primary interest of the qualitative research component lies in the subjective perspectives of the women on the meaning and process of empowerment, we have chosen to interview only women. Interview respondents were purposively selected based on the quantitative survey data. We created an aggregate empowerment score as the unweighted average time evolution from baseline to endline of all survey outcomes with less than 50% missing data<sup>7</sup>. After some minor adjustments to get a balanced sample in terms of age and geographic location, we selected 25 respondents, 7 women from the treatment group with a relatively high empowerment score, 3 with a relatively low empowerment score; 6 control-A women with a high and 2 with a low empowerment score; 4 control-C women with a high and 3 with a low empowerment score.

The sample of interview respondents for the qualitative data collection is necessarily limited in both size and selection and not representative of the full sample included in the quantitative study. However, at the end of the interview process, we felt close to having reached saturation and having obtained a complete spectrum of the women's perspectives on their empowerment process.

Interviews were carried out over a period of nine days between 29 June and 9 July 2017, three respondents within the same district were visited each day. All interviews were conducted in private between the respondent, the researcher and a female translator who had been involved in quantitative endline data collection.<sup>8</sup> The average interview duration was 1.5 hrs, with a range of 45 min to 3 hrs.

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[7] This requirement reduces the list to twenty included outcomes: nine categories of household decision-making, agricultural decision-making on the major food and cash crops and the adoption of any labor-intensive agricultural practices, ownership of land on which food and cash crops are planted, bicycle ownership, percentage of small live-stock and poultry owned personally compared to the household total, and group participation in terms of membership, input and leadership of any group.

[8] The interview transcripts are available on request. From October 2019 onwards, the interview transcripts will be accessible through the institutional data repository of the University of Antwerp.

In the qualitative interviews, we chose to focus mostly on decision-making since this represents both the essence of empowerment (agency) and the emphasis of the HRNS gender program (see [Supplemental File 3](#) for the interview guideline). We asked women how their weight in final decisions in the area of daily needs, food and cash crops, major household expenditures and land evolved over time, visualizing it on a scale from 1 to 10 for the current, last, and second to last agricultural season (see Figure A in [Supplemental File 3](#)). The first interviews highlighted the crucial importance of transparency and control over resources for women's involvement in strategic household decision-making, which led us to expand the interview guideline with questions on the usage and sharing of household and personal sources of income. To gain insight into whether women can 'imagine the possibility of choosing differently' (Kabeer, 1999: 441), the interviews not only ask about (changes in) the current situation, but include a question about the women's ideal situation in terms of decision-making for each category and whether they think it likely that they will reach this situation in the near future. In a final participatory element respondents are asked to evaluate how important weight in final decisions for the different categories is for them to lead the life they have reason to value (see Figure B in [Supplemental File 3](#)). Aside from household decision-making, group participation was included to better understand the spillover between the household and community spheres.

Interview notes were analyzed in at least four different ways: screening for patterns of different pathways for women's empowerment (informative), categorizing constraints and drivers for empowerment recurrently mentioned by women (informative), understanding what women value in an empowering process (reflective), reflecting on quantitative findings with the aid of women's accounts (reflective).

## 5. RESULTS

This section reports the quantitative and qualitative findings for each of the four research questions introduced in Section 2.5.

### 5.1. What meaning and value do women assign to different dimensions of empowerment in their household?

The first research question on the meaning and value women themselves give to empowerment is captured throughout the qualitative interviews. A participatory ranking exercise specifically inquired about the importance women assign to their weight in final decisions for the different categories of decisions discussed during the interview - daily needs, food crops, major household expenditures, cash crops and land - as well as the importance of input in the decisions of groups. The results for the 21 out of 25 respondents to whom this question was asked are shown in Figure 2 below. It is insightful to contrast women's ideal situation as reflected in this assignment of importance to the different categories of decision-making with their reality. The latter is summarized in Figure 3 which presents our translation of women's qualitative stories of whether or not they feel empowered in the categories of daily needs expenditures, food crops, cash crops, major household expenditures and transparency on income.





Bringing together reality and ideal situation, daily needs is the domain where women's involvement is most accepted, while women themselves assign this the lowest importance. They wish to and expect to share this responsibility with their husbands. Most women also have decision-making power on food crops, which, in contrast to daily needs, they find crucially important to assure their household's food security. Only somewhat more than half of the interview respondents feels empowered in decisions on major household expenditures and cash crops, while ideally most women strongly wish to be involved in these strategic domains in order to actively contribute to the well-being and economic development of their household, from which they derive great pride and sense of agency. Figure 3 further shows a clear correlation between financial transparency in the household and women's involvement in strategic domains, which will be clarified in the next section.

## **5.2. How do women perceive their process towards empowerment in their household?**

The qualitative in-depth interviews provided a rich source of information not only on the meaning and value women assign to different dimensions of empowerment, as discussed above, but also on women's perceptions of their empowerment process.

A first observation is the diversity of relationships between husband and wife, - happy or troubled marriages, large or smaller age differences, and of husbands and wives as individuals - some being young, other older with adult children, some being ambitious, others more passive. Furthermore, the degrees of self-perceived empowerment reported by the interviewed women showed great diversity as well. As discussed in the previous section, most women want to be actively and greatly involved in all decisions that matter for the household, but this is not always achieved. In reality their involvement depends on how strongly patriarchal norms are playing in their households. We call this a "*Wall of patriarchy*", a barrier to women's decision-making power within the household and to their empowerment. The strength of this "*wall of patriarchy*" is largely beyond women's control and depends mostly on the husband's goodwill.

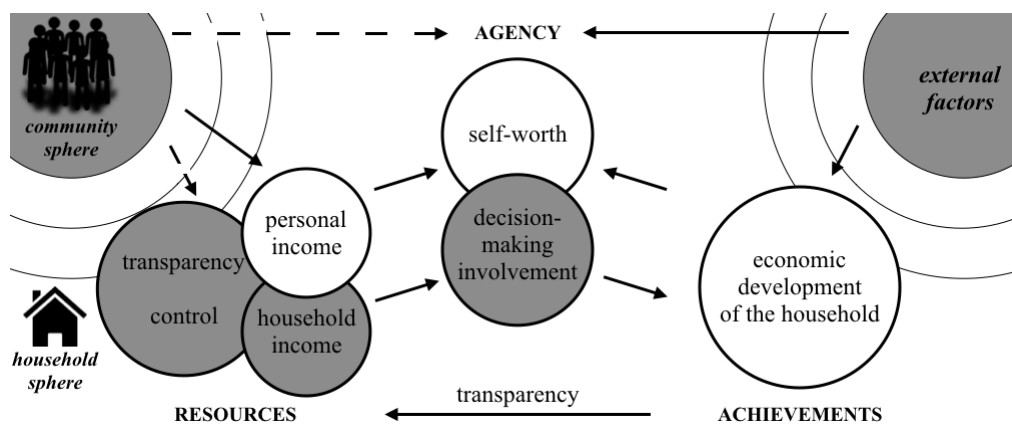
From the women's accounts, we could distinguish three broadly defined pathways towards empowerment, based on the wall of patriarchy (the first two are visualized in Figure 4). We labelled the first pathway "*Breaking through the wall of patriarchy*". This pathway is conditional on being lucky to have married a flexible husband who does not abide by patriarchal modes of organizing the household and is willing to be cooperative. About half of the interviewed women depicted this as the pathway to their empowerment. Most of them reported a source of personal income – sometimes through paid labor, but mostly through small livestock, trade, selling crafts or food and in a few cases through a personal coffee plantation - to supplement household needs and provide in their own needs but especially to increase their bargaining power within their household. Only two women on this pathway do not have personal income and solely rely on sharing household resources and benefits in full cooperation with their husbands. This pathway further splits into two situations: cooperation or goodwill. In the first situation, spouses cooperate and share decision-making power to some – small or larger – extent. In this situation, women can increase the chance the husband will be transparent over the household coffee income and share decision-making power over how that income should be spent by putting more effort into coffee production or investing some of her personal money in it. In the other situation, the husband is not transparent about the household income earned from coffee but he displays the goodwill to prioritize the household well-being. We see the interaction with the community sphere in the case of two women who have status in the community as well as

decision-making power over coffee (or their own coffee plantation). Additionally, one woman in a cooperative household is part of a group of couples who all attended a couple seminar where good cooperative practices in the household are discussed.

We labelled the second pathway, experienced by somewhat less than half of the interviewed women, “*Circumventing the wall of patriarchy*”. If women cannot, do not want to or no longer dare to rely on the cooperation or goodwill from the part of their husbands, the only pathway towards their empowerment is strengthening their independence within the household by taking control over resources. In this situation, earning a personal income is deemed extremely important to allow active contribution to the family or to manage the household by themselves if needed. Women consider personal income important to increase their bargaining power as well, but to a lesser extent. In this situation, women mostly have full control over food crops and their husbands full control over cash crops.

The third pathway is labelled “*No choice but to take full responsibility*”. In three cases, women had nearly full responsibility over food as well as cash crop production and other household affairs because their husband is a migrant worker or is ill. In these cases women do not really face a wall of patriarchy within their household but these women nevertheless indicated they were not happy with the situation. They feel this responsibility as a heavy burden that they would have preferred to share with their husband.

**Figure 4: Pathways of women’s empowerment.**



The circles with a white background indicate the “*Circumventing the wall of patriarchy*” pathway, while the circles with a gray background are additionally available to women on the “*Breaking through the wall of patriarchy*” pathway. Dashed arrows correspond to pathways described in the literature for which we have not found evidence in the interviews. We have added an arrow indicating the influence of the community sphere on women’s personal income through savings groups, and the iterative effect of the household’s economic development on women’s sense of self-worth.

Despite the diversity in women’s lived experiences, the interviewed women largely agree on what constitute the main obstacles to empowerment and what are conducive elements. The main obstacles – which cement the wall of patriarchy – are norms, rules and perceptions derived from a patriarchal societal organization, a husband who rigidly abides by such norms and rules, and women’s restricted capabilities linked to limited income, resources and freedom. The conducive elements to women’s empowerment as perceived by the women are listed in Table 1. We distinguished elements that are beyond women’s control (exogenous), elements or circumstances in which women’s agency plays a role, elements that increase women’s bargaining power and/or their independence, and external influences.

As became clear when we discussed the first pathway, a ‘flexible’ and responsible husband who is open to cooperation is conducive for women’s empowerment – but beyond her

control. A husband is more likely to be 'flexible' if he is educated. A small age difference between spouses and a longer marriage in which trust has been built are beneficial as well. An extramarital relationship of the husband is bad news for women's empowerment.

A woman gains decision-making power when she is able to manage the household in a crisis situation, when the husband is not around or ill, and when she can contribute to the household's food provision and other household needs from her own money or garden. As mentioned in the description of the first pathway, women can 'earn' decision-making power in agricultural production by contributing in planning, implementation and investment. When there is trust and joint decision-making on income and expenditure in the household, women reciprocate with transparency about their personal income. Without joint-decision making, in some cases women avoid transparency as they fear their husband would reduce his contributions to the household or to her personal needs. A woman can sometimes resort to threats such as refusing to provide labor when she does not agree with the decisions about cash crops (labor shirking), she can complain to the husband in order to change him, she can 'play the card' of the children, or she can threaten with separation. With regard to agricultural land, since women marry into the community where the husband normally already owns land, her right to that land is limited to a veto right to selling or renting it out, which she feels to be stronger in case of a legal marriage and with children. Women have somewhat more decision-making power over land acquired or developed during marriage.

Elements that increase women's bargaining power and/or their independence (depending on which pathway they are on) include personal income, personal savings in the form of livestock or savings in a group, a personal coffee or food garden, and personal land.

Some of the external influences conducive for their empowerment mentioned by women include membership of savings groups – for savings but also for knowledge and exchange, the couple seminars by HRNS, household visits and the authority of the HRNS gender officers, and other cooperative husbands or couples influencing their own husband. In case of land, sensitization workshops and the formal land right system are seen as helpful. Women also pointed to a number of external influences that stand in the way of sharing cooperative household practices such as norms prescribing that women should 'sacrifice' themselves for their household and persevere, that women's dignity depends on her success in managing the household and that cooperation in the household is seen as being lucky, not as a situation a woman has a right to.

**Table 1: List of conducive elements for women's empowerment as perceived by women**

<b>Enabling women's empowerment within the household</b>	
<b>Exogenous</b>	Flexible and responsible husband Educated husband Small age difference Longer marriage, more trust (negative) Extra-marital relationship or polygamy
<b>Agency</b>	Managing in a crisis situation or when the husband is not around or ill Contributing to the household's food provision and other household needs from own money or own garden Working and contributing in investment on coffee or in the development of agricultural land Being transparent on personal income, conditional on trust and joint decision-making in household Refusing to provide labor in case one does not agree with decisions about cash crops Complaining in order to influence or change husband Playing the card of the children or threatening with separation Acquiring or developing land during marriage
<b>Increasing bargaining power and/or independence</b>	Personal income and assets Personal savings (livestock, group savings) Controlling a personal food or coffee garden Children (to add to veto-power over land) Hiding of personal income to avoid that husband stops sharing household income
<b>External influences</b>	Land: Sensitization workshops; formal land right system Membership of savings group Membership of other group, for knowledge and exchange Couple seminars, household visits, HRNS authority Other husbands or cooperative couples for leverage and authority (negative) The risk of losing dignity and appreciation in community – “a woman is judged by her success in managing the household” - is in the way of extra-household (group) leverage to bargaining power (negative) Other women are often 'jealous' of cooperation in the household (which is in the way of sharing good practice): “Other women consider me lucky” (negative) Norms of serving the household benefit, work hard, persevere, and put yourself aside for the sake of the children is also transferred by other women

### **5-3. What is the impact of introducing participatory intrahousehold decision-making on different dimensions of women's empowerment?**

This third research question is addressed through impact analysis of the quantitative survey data. As discussed in Section 4.2 we estimate treatment effects by comparing the treatment group with control-A and with control-C using a two-stage IV regression to take into account imperfect compliance with the encouragement of treatment; a single regression analysis was used to compare the two control groups as well as the combined treatment and control-A group with the control-C group.

### **5.3.1. Controlling for women's initial level of empowerment with PSM**

In each model we control for initial levels of women's empowerment by matching the groups using available indicators for the conducive elements for empowerment described above in Table 1 as covariates. The randomization should have assured balanced distribution of these factors across treatment and control groups, but we opted to additionally control for women's initial level of empowerment to look at the catalyzing effect of participatory intra-household decision-making on different domains of women's empowerment.

The conducive elements in Table 1 which can be operationalized from the survey data include as exogenous factors the husband's education, age difference between husband and wife, age of the wife as a proxy for the duration of marriage and whether or not the husband reported having a second wife. Factors which increase women's bargaining power include personal off-farm income reported by the wife, personal ownership of a bicycle (personal assets), personally owned cattle and small livestock (personal savings), decision-making power on the staple food and cash crops as proxies for women's control over a personal food or coffee garden, and the number of children (up to age 16). Finally, we use membership of a savings or other group to operationalize external influences which are conducive to empowerment. In addition we control for exogenous household wealth through the land size as reported by the husband and the household food security reported by the wife. We additionally control for off-farm income reported by the husband, as this potentially lowers his stakes in cash crops and leaves more room for the wife's involvement (Agrawal, 2001). Tests for balance, based on Imai and Ratkovic (2014), did not reject the hypothesis of unbalanced distributions of covariates for any estimated model. The tolerance level for propensity scores to comply with the overlap assumption was set at 1e-8. In some cases where dependent variables suffered from too much missing data we did not exclude observations based on a set tolerance level, thus the overlap assumption may have been violated.

### **5.3.2. Decision-making**

#### **5.3.2.1. Women's involvement in decision-making over household expenditures**

The survey differentiates between nine categories of household expenditures (see Table 2). For each category, respondents were asked whether over the last three months any farm income was spent on these expenditures and who made the decision(s) to do so<sup>9</sup>.

There are significant positive treatment effects on decision-making about major household expenditures and investments when we compare women in the treatment or control-A group, with women in the control-C group. Women in the treatment group are 12% more likely to be involved in decisions about major household expenditures and 26% more likely to be involved in decisions about investment expenditures than women in the control-C group; women in the control-A group are 17% more likely to be involved than women in the control-C group for both types of expenditures. Women in the treatment group are also 28% more likely than women in the control-C group to be involved in decisions about sending money to relatives.

When we compare women in the treatment and control-A group, treatment effects are limited. There is an indication that women in the treatment group are 11% more likely to be involved in decisions about minor household expenditures (significant at 11%); but they are 10% less likely to be involved in decisions about major household expenditures.

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[9] If no expenditure was made, they were asked to what extent they feel they could make their own personal decision. We constructed a binary outcome variable of respondents' involvement in decision-making indicating they either personally, or jointly with their spouse or someone else outside the household made a decision, or they feel they could personally make such a decision to a large or medium extent.

**Table 2: Treatment effect for involvement in decision-making on nine categories of household expenditures: minor household expenditures, school fees and children's needs, health care, inputs in agriculture, major household expenditures, investments in a personal business, personal items, sending money to relatives, and social activities. The significance is indicated with the regression p(z)-value, and an additional (\*\*\*) for  $p < 0.01$ , (\*\*) for  $p < 0.05$ , (\*) for  $p < 0.1$  and (^) for  $p < 0.15$ .**

expenditure	effect	n	beta	stddev	P(z)	R <sup>2</sup>
minor HH	T-CA	294	0.11	0.07	0.11 (^)	
	T-CC	163	0.00	0.14	0.98	
	CA-CC	178	-0.05	0.13	0.68	0.003
	T+CA-CC	328	-0.08	0.13	0.55	0.006
school fees	T-CA	294	0.06	0.07	0.38	
	T-CC	163	0.19	0.14	0.18	
	CA-CC	178	0.00	0.13	0.98	0.000
	T+CA-CC	328	0.10	0.14	0.48	0.010
health care	T-CA	294	-0.01	0.07	0.92	
	T-CC	163	0.11	0.14	0.42	
	CA-CC	178	0.12	0.13	0.37	0.013
	T+CA-CC	328	0.13	0.14	0.33	0.017
agri inputs	T-CA	294	-0.03	0.06	0.61	
	T-CC	163	0.08	0.11	0.48	
	CA-CC	178	0.10	0.10	0.30	0.016
	T+CA-CC	328	0.08	0.09	0.35	0.011
major HH	T-CA	294	-0.10	0.05	0.04 (**)	
	T-CC	163	0.12	0.04	0.00 (***)	
	CA-CC	178	0.17	0.04	0.00 (***)	0.065
	T+CA-CC	328	0.14	0.03	0.00 (***)	0.055
investments	T-CA	294	-0.01	0.07	0.87	
	T-CC	163	0.26	0.10	0.01 (**)	
	CA-CC	178	0.17	0.10	0.08 (*)	0.035
	T+CA-CC	328	0.25	0.09	0.01 (***)	0.067
personal	T-CA	294	0.00	0.05	0.99	
	T-CC	163	-0.02	0.09	0.79	
	CA-CC	178	-0.02	0.11	0.86	0.001
	T+CA-CC	328	-0.02	0.10	0.87	0.000
relatives	T-CA	294	0.06	0.07	0.35	
	T-CC	163	0.28	0.11	0.01 (**)	
	CA-CC	178	0.13	0.09	0.16	0.019
	T+CA-CC	3258	0.22	0.09	0.02 (**)	0.054
social	T-CA	294	0.00	0.05	0.99	
	T-CC	163	0.15	0.15	0.32	
	CA-CC	178	0.06	0.11	0.57	0.006
	T+CA-CC	328	0.11	0.13	0.41	0.016

### 5.3.2.2. Women's involvement in decision-making over adoption of agronomic practices

### **for cash crops**

To evaluate the impact of the HRNS program on efficient and sustainable farming, respondents were asked whether in the last season they had adopted any agronomic practices for sustainable intensification for their coffee plantations and who in their household made the decision(s) to do so.<sup>10</sup>

Table 3 shows a positive treatment effect of 15% on the likelihood of women's involvement in deciding upon applying trenches in the coffee plantation when comparing the treatment and the control-A groups with the control-C group. The likelihood of being involved in decisions about applying compost is 35% higher for women in the treatment groups compared to women in the control-C group; 22% higher for women in the control-A group. There is an indication that women in the control-A group are 16% more likely to be involved in decisions about desuckering the coffee trees than women in the control-C group (significant at 15%).

There are negative treatment effects as well. As compared to control-C women, treatment women are 15% less likely to be involved in decisions about intercropping in the coffee garden; control-A women 25%. Treatment women are also 13% less likely to be involved in decisions about applying recommended weeding practices than control-A women.

**Table 3: Treatment effect for women's involvement in adoption decision on agricultural practices.**

<b>practice</b>	<b>effect</b>	<b>n</b>	<b>beta</b>	<b>stddev</b>	<b>P(z)</b>	<b>R<sup>2</sup></b>
<i>trenches</i>	T-CA	176	-0.03	0.06	0.66	
	T-CC	108	0.15	0.04	0.00(***)	
	CA-CC	108	0.15	0.04	0.00(***)	0.057
	T+CA-CC	189	0.15	0.03	0.00(***)	0.066
<i>intercropping</i>	T-CA	174	0.09	0.07	0.17	
	T-CC	94	-0.15	0.05	0.00(***)	
	CA-CC	119	-0.25	0.08	0.00(***)	0.115
	T+CA-CC	198	-0.18	0.03	0.00(***)	0.087
<i>compost</i>	T-CA	153	0.02	0.09	0.87	
	T-CC	90	0.35	0.08	0.00(***)	
	CA-CC	38	0.22	0.11	0.06(*)	0.084
	T+CA-CC	161	0.33	0.05	0.00(***)	0.130
<i>weeding</i>	T-CA	287	-0.13	0.06	0.04 (**)	
	T-CC	160	-0.02	0.14	0.89	
	CA-CC	173	0.09	0.13	0.45	0.010
	T+CA-CC	320	0.03	0.14	0.82	0.001
<i>desuckering</i>	T-CA	271	-0.02	0.07	0.82	
	T-CC	153	0.12	0.14	0.41	
	CA-CC	160	0.16	0.11	0.15(^)	0.031
	T+CA-CC	302	0.14	0.13	0.29	0.022
<i>stumping</i>	T-CA	257	-0.04	0.05	0.35	
	T-CC	144	0.00	0.09	0.96	
	CA-CC	150	0.00	0.11	0.99	0.000
	T+CA-CC	283	0.00	0.10	0.96	0.000

[10] Pruning and investing in mulch or fertilizer was adopted by less than 10% of respondents and treatment effects on these practices are not examined further.



### 5.3.3. Assets and income

#### 5.3.3.1. Women's asset holding

Assets, as well as income, provide the necessary resources to make strategic life choices and can thus be seen as a precondition for empowerment. The importance of assets was highlighted by the women we interviewed and through PSM we controlled for women's control over the plots on which the most important food and cash crop are grown and women's ownership of cattle, small livestock, poultry and bicycle as conducive initial conditions for their empowerment (Table 1). Here we examine treatment effects on livestock (cattle, poultry, and small livestock such as goats and pigs) owned by the women personally in comparison to the total amounts owned by the household (see Table 4). As such we make the distinction between access to resources and whether women in reality have control over their use.

To put the observed treatment effects in perspective, it is interesting to know that, on average, women own a relatively large share of their households' poultry (60%) and small livestock (55%), but a relatively small share of the cattle (15%).

We observe positive treatment effects when comparing treatment to control-A, with treatment women's share of small livestock 11% higher than that of control-A women. There are negative treatment effects on women's shares of poultry for. As compared to the control-C group, this is 25% lower in the treatment group, and 23% lower in the control-A group. We find no treatment effects on women's shares of cattle.

**Table 4: Treatment effect for women's asset holding: ratio of personally owned cattle, small livestock and poultry to the household total.**

asset	effect	n	beta	stddev	P(z)	R <sup>2</sup>
cattle	T-CA	141	0.06	0.05	0.24	
	T-CC	84	-0.12	0.21	0.56	
	CA-CC	33	-0.31	0.24	0.21	0.151
	T+CA-CC	155	-0.19	0.23	0.43	0.053
small livestock	T-CA	247	0.11	0.06	0.04 (**)	
	T-CC	142	0.08	0.08	0.33	
	CA-CC	151	-0.07	0.09	0.49	0.008
	T+CA-CC	279	0.02	0.08	0.81	0.001
poultry	T-CA	211	0.00	0.06	0.96	
	T-CC	127	-0.25	0.08	0.00 (***)	
	CA-CC	127	-0.23	0.07	0.00 (***)	0.097
	T+CA-CC	239	-0.25	0.07	0.00 (***)	0.119

#### 5.3.3.2. Women's personal income

Similar to assets, personal income is a precondition for empowerment and its importance was strongly emphasized by the women themselves in the interviews. Off-farm income of both wife and husband is included in the covariates used for PSM. Aside from off-farm income, the surveys ask about personal income earned in the last three months from selling livestock (comprising all types of livestock: cattle, small livestock and poultry) and receiving remittances. Table 5 presents the estimated treatment effects on the log transformed women's personal income from these sources.

There is an indication of a positive 38 % change ( $e^{0.32}-1$ ) in the income earned by women in the treatment group from selling livestock in the three months prior to endline data

collection as compared to that of women in the control-A group (significant at 13%); but not different from control-C women.

There are large positive treatment effects on income from remittances. As compared to that of control-C women, there is positive 127 % change of income from remittances if women are in the treatment group; a positive 72 % change if they are in the control-A group.

**Table 5: Treatment effect for women's income from selling livestock and remittances (logarithm of total amount received in the last three months).**

<i>income</i>	<i>effect</i>	<i>n</i>	<i>beta</i>	<i>stddev</i>	<i>P(z)</i>	<i>R<sup>2</sup></i>
<i>sale livestock</i>	T-CA	95	0.32	0.22	0.13(^)	
	T-CC	71	0.09	0.37	0.82	
	CA-CC	52	-0.38	0.48	0.43	0.024
	T+CA-CC	95	0.01	0.41	0.99	0.000
<i>remittances</i>	T-CA	124	0.15	0.17	0.39	
	T-CC	49	0.82	0.31	0.01(**)	
	CA-CC	58	0.54	0.28	0.05(*)	0.125
	T+CA-CC	126	0.75	0.28	0.01(**)	0.185

### 5.3.3.3. Control and transparency over income from coffee

With coffee being the main source of income for these households and given that transparency between spouses about cash income is not automatic, who receives the cash income from selling coffee is crucially important for control over this household resource. We use the ratio of income from coffee jointly or personally received by the wife over the total income received by the household as an indicator for women's control.

The qualitative interviews highlighted that apart from control, transparency and accountability of household resources are crucially important for women's involvement in decision-making. Women explained that if they are not aware of how much money is available, they cannot make decisions and, if they would propose a decision, their husband could claim he lacks the money. We assume that the level of transparency is higher if wife and husband report approximately the same amount of income earned from coffee and use the ratio of the gap between the wife-reported and husband-reported total income from coffee (absolute value) over husband-reported total income as an indicator (*transparency*<sub>1</sub>). A second dummy indicator *transparency*<sub>2</sub> takes the value 1 if that ratio does not exceed 25%. In Table 6 treatment effects on both transparency indicators and on women's involvement in receiving the income from coffee are presented.

The results, which should be carefully interpreted because of considerable missing data and possible violation of the overlap assumption, point to positive treatment effects on women's involvement in receiving the income from coffee. The ratio of income jointly or personally received by the wife over the total coffee income received is 15% higher in the treatment group than in the control-C group; in the control-A group it is 16% higher than in the control-C group. Transparency over the income from coffee however has not changed as a result of the introduction of participatory intrahousehold decision-making.

**Table 6: Treatment effect for control and transparency over coffee income.**

\*observations which violate the overlap assumption were not excluded due to missing data

income	effect	n	beta	stddev	P(z)	R <sup>2</sup>
(pers+joint)/total	T-CA	73	-0.03	0.07	0.62	
	T-CC*	46	0.15	0.07	0.04(**)	
	CA-CC*	41	0.16	0.08	0.04(**)	0.106
	T+CA-CC*	80	0.18	0.05	0.00(***)	0.150
transparency 1	T-CA	172	-0.02	0.05	0.70	
	T-CC	108	0.10	0.15	0.52	
	CA-CC	112	0.03	0.13	0.79	0.002
	T+CA-CC	196	0.09	0.15	0.54	0.013
transparency 2	T-CA	172	0.03	0.05	0.59	
	T-CC	108	-0.12	0.15	0.42	
	CA-CC	112	-0.07	0.13	0.58	0.009
	T+CA-CC	196	-0.12	0.15	0.41	0.024

#### 5-3-4. Group participation

Groups provide an arena outside of the household where gender norms can be discussed and where collective solidarity can enhance women's ability to negotiate change within their households. The surveys differentiate between agricultural producer organisations (PO), micro-credit groups (MC), and 'other' (community, religious, parents, women,...) groups. Aside from simply recording membership, the surveys probe the level of group participation and representation through questions on whether respondents hold a leadership position, how comfortable they feel speaking in the group, and how much input they feel they have in the group's decisions (Table 7).

Women in the control-A group are 5% more likely to be member of a micro-credit group than women in the control-C group. Women in the treatment group are as likely as control-A and control-C women to be in a micro-credit group, but they are 11% less likely than control-A women to be member of another type of group. Treatment and control-A women are 24% more likely to be member of a producer organisation, probably due to the fact that they are in the HRNS program due to their current active involvement in their PO.

The results for women's leadership positions, comfort with speaking and input in decisions in the group should be considered with care because of considerable missing data and possible violation of the overlap assumption. Nevertheless, as compared to women in the control-C group, it is 9% more likely that treatment women feel they have an input in decisions in their micro-credit group and 28% more likely they hold a leadership position; control-A women are 10% more likely to have input in decisions and 26% more likely to take a leadership role. Control-A women are 4% more likely to feel their input matters in decisions in their PO as compared to control-C women. Conversely, the likelihood that treatment women and control-A women feel at ease speaking in public in their PO is 34%, respectively 30%, lower than among control-C women.

**Table 7: Treatment effect for group participation through membership, extent to which women feel comfortable speaking in public, extent to which they feel they have input in the group's decisions, and whether or not they hold a leadership position. Less than 10% of respondents report group membership for the category of 'other' groups and thus provided a valid answer to the subsequent questions; these indicators are not included.**

\*observations which violate the overlap assumption were not excluded due to missing data

practice	effect	n	beta	stddev	P(z)	R <sup>2</sup>
membership PO	T-CA	294	0.06	0.07	0.38	
	T-CC	163	0.24	0.14	0.09(*)	
	CA-CC	172	0.24	0.11	0.02(**)	0.059
	T+CA-CC	328	0.23	0.12	0.06(*)	0.053
membership MC	T-CA	294	-0.02	0.06	0.76	
	T-CC	163	0.12	0.12	0.36	
	CA-CC	172	0.05	0.11	0.07(*)	0.003
	T+CA-CC	328	0.08	0.12	0.49	0.008
membership other	T-CA	294	-0.11	0.04	0.01(**)	
	T-CC	163	-0.01	0.10	0.89	
	CA-CC	172	0.05	0.07	0.50	0.005
	T+CA-CC	328	0.01	0.09	0.87	0.001
comfort speaking PO	T-CA	62	0.01	0.15	0.97	
	T-CC*	35	-0.34	0.12	0.01(**)	
	CA-CC*	37	-0.30	0.17	0.09(*)	0.066
	T+CA-CC*	67	-0.35	0.10	0.00(***)	0.122
comfort speaking MC	T-CA	67	0.01	0.10	0.95	
	T-CC*	37	-0.04	0.12	0.75	
	CA-CC*	44	-0.03	0.11	0.77	0.002
	T+CA-CC*	74	-0.05	0.10	0.65	0.005
input decisions PO	T-CA	153	-0.01	0.04	0.77	
	T-CC	82	0.02	0.02	0.32	
	CA-CC*	83	0.04	0.02	0.10(*)	0.011
	T+CA-CC	161	0.03	0.01	0.05	0.008
input decisions MC	T-CA	97	0.00	0.07	0.98	
	T-CC*	60	0.09	0.04	0.03(**)	
	CA-CC*	59	0.10	0.05	0.05(*)	0.041
	T+CA-CC	90	0.09	0.03	0.01(**)	0.037
leadership PO	T-CA	153	-0.02	0.04	0.67	
	T-CC	82	0.03	0.04	0.53	
	CA-CC*	83	-0.02	0.06	0.71	0.002
	T+CA-CC	143	0.01	0.04	0.68	0.001
leadership MC	T-CA	97	-0.10	0.11	0.40	
	T-CC*	60	0.28	0.11	0.01(**)	
	CA-CC*	59	0.26	0.09	0.01(**)	0.090
	T+CA-CC	90	0.28	0.07	0.00(***)	0.106

### 5-3-5- Time use

The traditional gender division of household activities is an important aspect of women’s empowerment. When increased participation by women in productive and community activities is not accompanied by changes in the division of reproductive labor, empowerment initiatives risk increasing women’s workload. This is recognized by the HRNS gender program, which explicitly mentions “reduced workloads of women at home and time to participate in productive activities” as an expected outcome (HRNS, 2016: 26). The couple seminars put much emphasis on the importance of sharing all roles and responsibilities within the household (F. Paska, personal communication, 13 July 2017).

The survey asked respondents about the number of hours per day spent on productive activities (crop production, harvesting, post-harvest handling, taking care of livestock, and off-farm income activities), reproductive activities (taking care of children, cleaning, washing, cooking, fetching water and firewood), and leisure activities (daytime resting, entertainment, social visits and activities related to church or social groups). The total reported time adds up to on average 11.4 hrs for men and 11.8 hrs for women. Productive activities take up the majority of the day, with 77% of total time for men and 53% for women. Women spend 33% of their time on reproductive activities compared to 6% for men. We can alternatively compare time shares for the various activities between husbands and wives in the same couple, where we find that men spend on average 2.75 hrs more on productive activities, 0.4 hrs more on leisure, and 3.1 hrs less on reproductive activities compared to women (within a hypothetical working day of 12 hrs as was done in Lecoutere and Jassogne (2017)). Our indicators represent the difference in the share of time that the husband and the wife reported to allocate to leisure, productive and reproductive activities (Table 8 presents treatment effects on these indicators). The indicators assume a negative sign if the woman allocates a greater share of time.

There are no treatment effects on time use, not in the productive or reproductive sphere, nor on time spent on leisure.

**Table 8: Treatment effect for the difference in productive, reproductive and leisure time shares between husband and wife.**

<i>activity</i>	<i>effect</i>	<i>n</i>	<i>beta</i>	<i>stddev</i>	<i>P(z)</i>	<i>R<sup>2</sup></i>
<i>productive</i>	T-CA	293	-0.01	0.04	0.73	
	T-CC	163	0.05	0.09	0.59	
	CA-CC	178	-0.01	0.07	0.93	0.000
	T+CA-CC	327	0.03	0.08	0.69	0.004
<i>reproductive</i>	T-CA	293	-0.01	0.02	0.68	
	T-CC	163	0.00	0.03	0.92	
	CA-CC	178	0.04	0.03	0.26	0.014
	T+CA-CC	327	0.01	0.03	0.76	0.001
<i>leisure</i>	T-CA	293	0.02	0.03	0.54	
	T-CC	163	-0.05	0.09	0.57	
	CA-CC	178	-0.03	0.07	0.64	0.005
	T+CA-CC	327	-0.04	0.08	0.61	0.006

### 5.3.6. Achievements at the household level

Achievements are the outcomes of decision-making agency and a common indicator of women’s empowerment. At the household level, we look at the impact of the Change Agent program and couple seminars on women’s perception of the evolution of well-being (in terms of income and consumption) and food security of their household compared to one year ago. Such evolution is subject to other influences apart from cooperation in the household, such as weather, luck, pest, illness,.... Some of those influences can be assumed to be common shocks and affect all households, while randomization should assure idiosyncratic influences are balanced across treatment and control groups. Hence we expect to be able to capture the effect of more cooperative household farming as a result of participatory intra household decision making on household achievements.

Table 9 shows that women in the treatment group are 16% more likely than women in the control-C group to report a positive evolution in their households’ food security; women in the control-A group are 13% more likely than women in the control-C group to report a positive trend in food security. There is an indication that women in the treatment group are also 10% more likely to report that their household well-being is (much) better than one year ago compared to women in the control-A group (significant at 14%).

**Table 9: Treatment effect for economic development of the household in terms of women’s perceptions on the evolution of their household’s well-being and food security compared to one year before the end-line survey.**

<i>evolution</i>	<i>effect</i>	<i>n</i>	<i>beta</i>	<i>stddev</i>	<i>P(z)</i>	<i>R<sup>2</sup></i>
<i>HH well-being</i>	T-CA	293	0.10	0.06	0.14(^)	
	T-CC	163	-0.04	0.15	0.80	
	CA-CC	176	-0.13	0.13	0.29	0.019
	T+CA-CC	326	-0.10	0.14	0.48	0.010
<i>HH food security</i>	T-CA	294	-0.06	0.05	0.23	
	T-CC	163	0.16	0.04	0.00(***)	
	CA-CC	177	0.13	0.04	0.00(***)	0.038
	T+CA-CC	321	0.14	0.03	0.00(***)	0.052

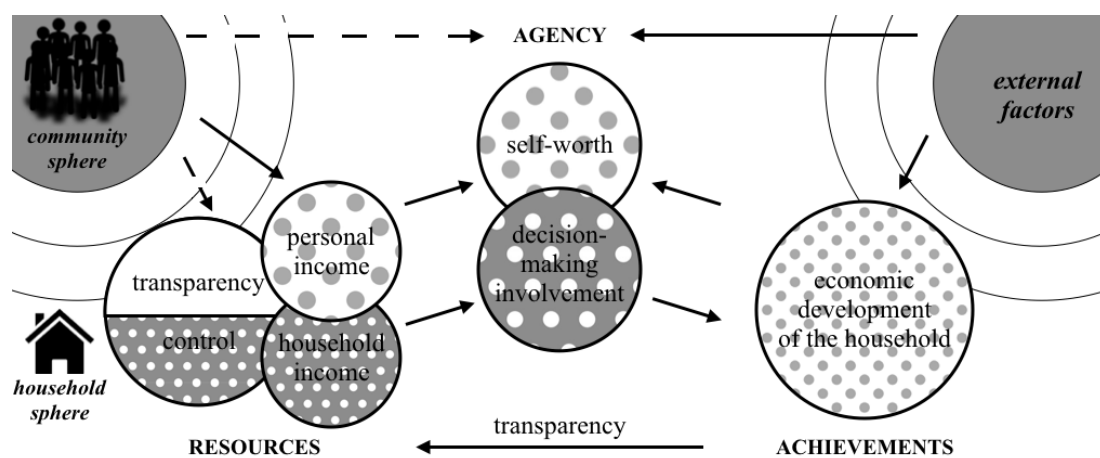
### 5.4. How does the impact of introducing of participatory intrahousehold decision-making fit into women’s own strategies for empowerment?

After levelling out initial empowerment of women across treatment, control-A and control-C groups via propensity score matching on a number of conducive elements for empowerment identified from the interviews, the analysis in the previous section quantitatively examined the catalyzing effect of introducing participatory intrahousehold decision-making through the Change Agent program (treatment) and the couple seminars (control-A). In this section we examine to what extent the impact of introducing participatory intrahousehold decision-making fits into women’s own strategies for empowerment. We visualize this in Figure 5.

The Change Agent program - but not the couple seminars - catalyzed women’s personal ownership of small livestock and personal income from selling livestock. Women’s personal income from remittances increased as well, both as a result of the Change Agent program and the couple seminars. In terms of access to group savings, only the couple seminars promoted women’s participation in micro-credit groups to a small extent.

Being able to provide for themselves and their households using their own resources gives women a great sense of power and subjective agency. As discussed previously, women use personal assets and income in both the “*Breaking through the wall of patriarchy*” and the “*Circumventing the wall of patriarchy*” pathways of empowerment. For the latter, personal assets and income allow them to independently provide for themselves and their household if needed. For the former, personal assets and income strengthen women’s bargaining power, which may be good news for collective action and more equitable and sustainable livelihood outcomes of the common household farm. The positive effect of the change agent program and couple seminars on the household’s food security and the positive effect of the change agent program on overall household wellbeing point in that direction.

**Figure 5: Introducing participatory intrahousehold decision-making increases women’s personal income and shared control over household coffee income, but not transparency.**



Women’s decision-making involvement in strategic decisions essential to empowerment (major household expenditures and cash crops) is strengthened. This leads to gains in household achievements reflected in improved food security. Reasonable assumption that women’s self-worth increased. Large dots represent relatively strong effects, small dots weaker effects.

It is interesting to note that the Change Agent program positively affected ownership of livestock, assets kept within the household, while the couple seminars positively affected women’s access to group savings, assets that can be hidden and are not easily accessible to other household members. Income from remittances, catalyzed by both interventions, could be easily hidden as well. There is observational and experimental evidence, also from Uganda, showing that people value the opportunity to hide income and resources from their spouse, women possibly more, one of the reasons being the ability to retain control over how it is spent (Iversen et al., 2011; Munro, 2017) In the qualitative interviews, women mentioned hiding their personal income and assets to prevent their husbands from reducing his contributions to the household. Possibly, women in couples who followed the Change Agent program are a bit more confident about keeping control over their personal resources and their husbands contributions; although nothing changed with regard to transparency about income from coffee, as we will see later.

The Change Agent program as well as the couple seminars seem to have catalyzed women’s control over income earned from coffee (as shown from the ratio of income jointly or personally received by the wife over the total coffee income). However, contrary to what one might expect, more shared control did not increase transparency over the income earned from coffee (as mea-

sured by the gap between wife- and husband reported income).

In the qualitative analysis of women's perceived pathways of empowerment it became clear that sharing control over household income and transparency over that income is only present in the "*Breaking through the wall of patriarchy*" pathway, and not in all cases. Women who "*Circumvent the wall of patriarchy*" on their pathway to empowerment reported sharing of household income and transparency to be absent. Thus, through their contribution to sharing control over coffee income, the Change Agent program and couple seminars may support women in "*Breaking through the wall of patriarchy*". According to women, both transparency and shared control over financial resources, including the income from coffee, are necessary and complementary conditions for their involvement in (strategic) decision-making in the household.

In line with women's priorities, both the Change Agent program and the couple seminars catalyzed women's decision-making power over strategic major household expenditures and business investments to the same extent. Both interventions therefore may aid women towards a pathway of "*Breaking through the wall of patriarchy*". Possibly, increased involvement of women in strategic decision-making in combination with a greater extent of sharing control over financial resources between spouses could also have contributed to lifting some of the collective action problems that these agricultural households face, more specifically information asymmetry and opportunistic behavior. This is reflected in treatment effects on economic development of the households. Additionally, the Change Agent program increased women's decision making power over minor day-to-day expenditures, which is easier to achieve and less of a priority to women. The Change Agent program also increased women's decision-making power over sending remittances to relatives, which could be important from a perspective of women's self-determination and social capital.

The gains in women's other priority strategic domain of cash crop production are less spectacular. Through the Change Agent program, but also through the couple seminars, women are more involved in decisions of applying compost and trenches in the household coffee plantation. In contrast, their involvement in decisions about intercropping decreased; about weeding as well but only as a result of the Change Agent program. One could speculate that the reduced involvement of women in decisions about intercropping and weeding, two labour intensive practices that are typically women's responsibility, points to greater shared responsibility. Whether these mixed results of women's involvement in decisions on sustainable intensification of cash crops indicate better cooperation with regard to household agricultural production is inconclusive.

The HRNS Gender Household Approach - neither the Change Agent program nor the couple seminars - did not make any change with regard to the intrahousehold time allocation despite great emphasis on a shared work burden. It remains a sticky domain, especially in this context with gender roles strongly informed by patriarchy.

With regard to group membership, qualitative information suggested women appreciate micro-credit groups but face constraints to participate in groups due to a lack of capital or time, or because their husband is not keen on their participation. Women also mentioned that jealousy, gossip and unsupportiveness keeps them away from joining groups. These factors could explain why few women, and only those in couples who participated in couple seminars, took the opportunity to join micro-credit groups. But, both the Change Agent program and the couple seminars boosted women's leadership particularly, and their input in decisions in micro-credit groups to some extent. The fact that the Change Agent program and couple seminars are



negatively related to women's ease at addressing producer organisations does not have a ready explanation.

A final question to address is the extent to which the introduction of participatory intrahousehold decision-making through the Change Agent program and the couple seminars answered to women's priorities in terms of their empowerment. The treatment and the couple seminars contribute to realizing women's aspiration to be involved in decisions on strategic household expenditures and cash crops in order to actively contribute to their household's development. Women's priority of sharing control over the income from coffee with their husband may also be attained to some degree with the help of the HRNS Gender Household Approach. Although highly valued by women and important to lift collective action problems due to information asymmetry, transparency over income from coffee has not benefited from the program. The positive impact of the HRNS Gender Household Approach on women's asset ownership and personal income contributes to women's own strategies of increasing their bargaining power and gaining control over resources. Finally, for women, assuring their household's food security is of crucial importance, which is promoted by both the Change Agent program and the couple seminars.

## **6. CONCLUSION**

Participatory intrahousehold decision-making is likely to promote collective action in agricultural households and thus efficiency and sustainability by reducing information symmetry. In addition, when spouses are better informed about the household investment and expenditure needs, and about each other's contributions to and consumption from the household resources, a more equitable manner of sharing costs and benefits in the common household farm system - to the benefit of women who are mostly disadvantaged in this regard - can be expected. Given the patriarchal context where women have very little voice and influence on household decisions, participatory decision-making which increases women's voice and decision-making power in their households is expected to have an effect on women's empowerment. This is investigated for the first time in this study through a mixed-method approach which measures women's empowerment in its complexity and includes the psychological dimension.

In conclusion, the introduction of participatory intrahousehold decision-making through the Hanns R. Neumann Stiftung Gender Household Approach is helpful in supporting women in following a pathway to empowerment by "*Breaking through the wall of patriarchy*" by increasing women's involvement in strategic household decisions and women's control over household income, personal income, and personal assets. Personal income and assets are even more important for women "*Circumventing the wall of patriarchy*" and undoubtedly also for women who are forced to manage on their own because their husbands are absent or ill. To some extent the introduction of participatory intrahousehold decision-making enhanced women's involvement in decisions about cash crop production, another strategic domain that women value as a way to actively contribute to the development of their households and "*Break through the wall of patriarchy*". However, despite the emphasis on shared work burdens, the intervention falls short in changing intrahousehold time allocation to productive and reproductive activities and leisure. Overall, the findings suggest that participatory intrahousehold decision-making can increase women's voice and decision-making power in some domains and contribute to a more equitable manner of sharing benefits from the common household farm system to some extent. The positive effects on economic household wellbeing, especially food security, may follow from the improved cooperation between spouses.

This study hints that, if given the choice, women would opt for the pathway in which they break through the wall of patriarchy and cooperate within the household. It would be worthwhile investigating what personal and household characteristics allow breaking through the wall. A mixed methods approach has proven enlightening in understanding women's empowerment processes, including from their perspective, and is the recommended method for any further study.

The patriarchal norms and traditions which constrain the roles and responsibilities men and women can and cannot take up within their household are learnt and reinforced over many years. Undoing them can likewise take time and potentially other, or stronger, treatment effects will be realized beyond the one-year time period covered by this study. Programs should allow the non-linear and gradual empowerment process to run its course and provide support along the full journey. A follow up study would be valuable to understand what changes over a longer term period.

Even when programs follow a gender transformative approach which aims to challenge and change gender imbalances through changing decision-making processes, women should be supported in their strategy of building economic power. As such, both their husbands and society are given instrumental reasons to rethink patriarchal gender constraints and welcome the involvement of women in economic development. At the same time we should remain vigilant not to overburden women.

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