Economic Analysis of Community-based Development Interventions in Rural Pakistan

by

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Executive Summary

This dissertation undertakes the economic analysis of community-based development (CBD) interventions in rural Pakistan, with a focus on empirical analysis of the targeting, matching, and impact of such interventions. “CBD” is a term used in reference to projects that allow for the active participation of its end-users in their design and management. Recently, the approach has become popular as a development strategy in developing countries, because it is expected to improve the targeting performance, efficiency, accountability, and transparency of poverty-reduction interventions.

Pakistan lags behind other South-Asian nations in implementing CBD projects; one of the reasons for this could be the male dominance inherent in its society. Participation by women in the labor market and in citizens’ activities outside the home is low, making it difficult to pursue there a CBD approach that involves women. Reflecting the lack of CBD activities in Pakistan, the number of academic studies on them is also small.

In this dissertation, I attempt to fill these research gaps by investigating the case of a women-driven and women-focused nongovernmental organization (NGO); such an organization is rare in the Pakistani context. Research on the CBD approach that involves econometric analysis, within such a unique context, is therefore a valuable contribution to the existing literature.

I address two general research questions: (1) whether CBD interventions are well targeted towards the poor, and if yes, under what conditions; (2) whether CBD interventions result in improvements in the welfare of participants, and if yes, under what conditions.

To answer these questions, I conduct in-depth analysis, covering all the major steps of the CBD process, that is, targeting performance; within the community organization (CO) dynamics, through analysis of the preference-matching process; and impact assessment. In each step, I pay sufficient attention to clean identification, using microeconometric tools. Owing to the lack of such evidence in the case of Pakistan, the analysis in this dissertation is expected to contribute significantly to the literature.

For the empirical analysis, I conducted original surveys to compile a comprehensive dataset. I conducted six surveys that were implemented in collaboration with the NGO. As the main data source, I use a two-year panel dataset of villages and sample households, comprising the

baseline and follow-up surveys. I also collected detailed information on COs on a census basis. The panel dataset of sample households also contains information on an intervention conducted as a randomized controlled trial (RCT) to mitigate crop income losses stemming from wild boar attacks (WBAs). This is one of the rare attempts in Pakistan to apply RCTs to the assessment of CBD activities.

The empirical results are summarized in terms of targeting performance, preference-matching, the impact of community-based organization (CBO) participation on welfare indicators, and the impact of RCT intervention, in that order.

I first assess targeting-performance by testing the following two hypotheses: (1) whether CO villages are systematically poorer and more vulnerable than non-CO villages; (2) whether CO members (*T*-group) are systematically poorer and more vulnerable than non-members (C_1-group) in CO villages. I test the hypotheses by using baseline village and household level surveys. Results vis-à-vis targeting performance is well in place. The NGO has been able to reach out to poorer villages with lower levels of adult literacy and access to basic amenities, and higher susceptibility to natural disasters; it has also reached out to households with lower access to basic amenities and greater vulnerability to natural disasters.

In the next stage, I conduct the preference matching analysis in two ways: (1) match between preferences of CO members, CO-proposals, and PHKN interventions, and (2) identify correlates of the preference matching of CO members, CO-proposals, and PHKN interventions To cover all the mentioned dimensions of performance-matching process, I use a comprehensive dataset compiled from CO survey, baseline and follow-up surveys of sample households, and CO meeting records. I find the overall matching of 70 percent between CO members' preferences and CO-proposals and 52 percent between CO-proposals and PHKN interventions. At the same time, I show that CBD interventions were free from the elite capture and no difference between female and male COs as far as the preference matching is concerned. Moreover, NGO facilitator influence was weak.

In the last stage, I conduct two types of impact assessment. In the first assessment, which involves a conventional methodology that employs household surveys, I compare welfare indicators of CO (*T*-group) and non-CO (C_1-group and C_2-group) households. I use a two-year panel dataset of villages and sample households. The analysis shows that CO membership has improved the welfare of member households in terms of women's empowerment, credit access, *Zakat* payment, and the resilience to withstand micro-shocks; nonetheless, membership was also

found to have a minimal impact on the consumption growth of members.

In the second impact assessment, I examine the impact of RCT intervention on crop losses due to WBAs and consumption measures. I apply the difference-in-difference (DID) econometric technique to a two-year panel dataset of the households eligible to be included in RCT. I find a significant reduction in the crop-income losses of the treated households. . Nevertheless, the impact of the intervention on consumption measures is insignificant.

I speculate that these empirical findings suggest that the active involvement of women at the NGO's management and end-user level upon embracing CBD approaches leads to better targeting performance and positive impacts, as well as the absence of elite capture. As this dissertation investigates only one NGO, the provision of empirical evidence with regard to this speculation is left to future research.

With regard to empirical findings, future research can take several directions in supporting and strengthening the evidence offered by this dissertation. Expanding the database by the use of social experiments is one direction, and this is especially useful in cleanly identifying the influence of facilitators in the preference-matching process. There is a need for further investigations regarding the opportunity costs incurred with participation in CBD activities and other factors that may possibly dilute the welfare impact of CBD activities.

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Chapter 1: Introduction

1.1 Background and Motivation

In recent years, the involvement of local communities in developmental activities has become an essential part of poverty-reduction strategies (Binswanger–Mkhize et al., 2010). According to Mansuri and Rao (2004), "Community-based development [CBD] is an umbrella term which refers to projects allowing active participation of its end-users in project design and management process while community-driven development [CDD] pertains to those CBD projects in which communities directly control key decision making" (p.2).[1] Community participation is expected to improve the targeting, efficiency, impact, accountability, and transparency of poverty-reduction interventions, because of its use of local intelligence and resources to develop a sense of ownership among the local communities (Bardhan, 2002). CBD and CDD can contribute to the decentralization of power, and to the empowerment of local communities (Bardhan and Mookherjee, 2000); therefore, CBD is emerging as a popular model for grass-root level development—an emergence that has manifest as a stark increase over the years in World Bank funding for CBD projects (Mansuri and Rao, 2004).[2]

In South-Asia, where CBD activities used to alleviate poverty and develop local communities are commonly found today, similar activities can be traced back to the 1940s (Binswanger–Mkhize et al., 2010). However, as a nation of South-Asia, Pakistan trails not only in this respect, but also in terms of human resource development (HRD). Successive regimes in Pakistan, whether elected or not elected, have been unable to provide Pakistanis with either access to basic amenities or institutions of local governance at the grassroots level, for a number of reasons. During the 1970s, nongovernmental organizations (NGOs) entered the arena with the objective of filling the gap left by the public sector in providing essential public goods; however, they had little success (Khan et al., 2011). The apparent reasons for this failure are deep-rooted social inequality, that is, the unequal distribution of income and assets; strong

[1] According to the World Bank's Poverty Reduction Strategy Paper Sourcebook (Dongier et al., 2003), CDD is a mechanism to enhance sustainability, improve efficiency and effectiveness, allow the upscaling of poverty reduction efforts, make development more inclusive, empower poor people, build social capital, strengthen governance, and complement market and public sector activities. CDD is expected to achieve these by reducing information issues associated with the identification of development priorities, projects, and eligible recipients of private benefits in target communities, while enhancing the resources available to the poor through credit, social funds, capacity building, and occupational training, and building the civic capacities of the communities by nurturing their representative organizations.

[2] World Bank assistance to CBD projects increased from USD 325 million in 1996 to USD 3 billion in 2003. By 2001, the World Bank had financed over 98 social fund projects in 58 countries (Rawlings and Schady, 2002).

networking among the elite, based on familial, clan, and tribal relations; and little exposure to concepts like community-based organizations (CBOs) and their use in grass-root development (Kurosaki, 2006). In any case, limited microeconomic research has been undertaken vis-à-vis CBD activities in Pakistan, save for a few isolated studies (e.g., Khwaja, 2009; Cheema et al., 2006; Kurosaki, 2005).

The relative lack of NGO activities and of research in Pakistan with regard to the CBD approach thus motivates this dissertation. As a study that focuses on CBD initiatives in rural Pakistan while employing rigorous analysis, this dissertation is a valuable addition to the existing literature.

1.2 Literature on the Economics of Community-based Development Interventions

Despite the growing popularity of CBD interventions, they often suffer from mistargeting (ADB, 2006; Mansuri and Rao, 2004; Rao and Ibanez, 2005; Chase, 2002; Paxson and Schady 2002; World Bank 2002) and elite capture (Bardhan and Mookherjee, 2005). Furthermore, it is difficult to develop consensus among member households owing to household-level heterogeneity, and this adversely affects need prioritization—particularly with respect to the selection of public projects, participation in civic activities, and targeting effectiveness (Alesina and La Ferrara, 2000; La Ferrara, 2002b; Galasso and Ravallion, 2005; Banerjee and Somanathan, 2007; Araujo et al., 2008).

The existing CBD and CDD literature can be broadly classified into three generations. The first-generation studies are based on anecdotal evidence; those of Finsterbusch and Van Wicklin (1989) and Abraham and Platteau (2004) are well-known examples. The second-generation studies include theoretical and descriptive empirical work; the study of Bardhan and Mookherjee (2000) is one of the most influential theoretical studies. There are a large number of empirical studies in this category, and they have mixed results and different levels of authenticity and technical depth; examples from this generation are the studies of Katz and Sara (1997), Khwaja (2004), Rao and Ibanez (2003, 2005), and Park and Wang (2010). The third-generation studies employ rigorous program evaluation methodologies, including randomized controlled trials (RCTs[3]). The work of Khwaja (2009), Labonne and Chase (2009), and Arcand and Fafchamps (2011) are some of the well-known studies belonging to this generation.

[3] Well-known studies employing RCTs in development economics in general are those of Banerjee and Duflo (2008), Gugerty and Kremer (2008), Ashraf et al. (2009), Rassekh and Segaren (2009), Casey et al. (2010), and Dupas and Robinson (2011, 2012), among others.

In the remainder of this section, I will focus on the studies that are directly relevant to the scope of this dissertation. I will summarize each study in turn, in line with the structure of this dissertation.

CBD activities result in the decentralization of power. According to Bardhan and Mookherjee (2000), local governments are often well-informed of local conditions, but tend to be highly susceptible to elite capture[4] in the absence of a reliable mechanism of accountability. They theorize that elite capture increases with an increase in local inequality.

Rao and Ibanez (2003, 2005) investigate the preference-matching process (termed as "preference targeting" by the authors) in the Jamaica Social Investment Fund (JSIF). They employ retrospective data collected from a sample of JSIF member communities. These studies attempt to match the major needs of the communities with JSIF interventions. Rao and Ibanez report a mismatch between community needs and project interventions, that is, only two of five community needs were addressed by the interventions. Moreover, the studies show that community members who have higher education and stronger networking dominate decision-making and match their preferences more successfully with project interventions than those lacking such attributes. Interestingly, the aforementioned elite domination does not constitute a pure elite capture but an *altruistic elite capture*, as around 80 percent of the respondents were satisfied with project outcomes. However, since the studies employ retrospective data, these studies' results may suffer from recall bias.

Labonne and Chase (2009) also focus on the preference-matching process of the CBD approach, albeit in a different way. They examine the mechanism through which household-level preferences are aggregated to generate community-level proposals, by using data from a CDD project implemented in the Philippines. Furthermore, the study investigates how proposals are chosen by the communities and resources are allocated across the villages. The results of that study support the flow of resources to the poorest and most politically active villages; furthermore, they find that both a community and its leader are able to represent equally their preferences in the community proposals. The study also finds that elected leaders of villages with heterogeneous communities tend to dominate their communities' preferences. However, the authors admit to the study's shortcomings: "given decision-making procedures in CDD projects, narrow measures of community preferences fail to capture households' interest in several types of support. Further, it is hard to model in a simple way how household preferences

[4] According Bardhan and Mookherjee (2000), elite capture of the local government is not a universal phenomenon.

are aggregated" (Labonne and Chase, 2009, p.228).

Humphreys et al. (2006) investigate the potential influence of facilitators in shaping the opinion of a community. That study involves a countrywide social experiment that comprises deliberative public meetings implemented in the island state of Sao Tome and Principe, which has a total population of 160,000. The public debates focus on the potential use of expected oil revenues. To facilitate smooth debates, each of the groups was assigned a discussion leader (i.e., facilitator) for the purposes of moderation, and recording detailed outcomes. Bearing in mind the random nature of the assignment, the authors were able to gauge the influence of facilitators on the outcomes of these group discussions, ultimately determining the considerable influence of those facilitators. Indeed, "the preferences recorded in the deliberative meetings to a large degree reflect the preferences of discussion leaders, not participants" (Humphreys et al., 2006, p.24). Being a social experiment, the internal validity of the study is not an issue, but external validity remains questionable.

Bjorkman and Svensson (2009) analyze a randomized field experiment involving the frequent community-based monitoring of local health services in Uganda. That study shows that the regular monitoring of service providers results in improvements in health services, in terms of both quality and quantity. The community monitoring also resulted in lower absenteeism among health officials, improved responsiveness in terms of waiting times, and more concerted efforts by service providers, as well as overall improvements in health-service utilization and declines in child mortality. The authors assume there to be few spillover effects stemming from interventions among control groups, owing to an average distance of 30 km between the control and treatment groups. However, the study emphasizes, "before scaling up, it is also pertinent to subject the project to a cost–benefit analysis and relate the cost–benefit outcomes to other possible interventions" (p.26).

In summary, the existing literature is dominated by case studies that are mostly based on qualitative and descriptive analysis. Although such case studies have enriched the existing literature with detailed narratives of strategies, timeframes, actors' perspectives, and intermediate setbacks, they are less powerful in segregating the contribution of social action from other contextual factors. A large number of studies review outcomes of specific initiatives, without attempting to draw broader conclusions about the effectiveness of specific interventions under particular contexts (Joshi, 2010).

In any case, it is difficult to establish causality (Mansuri and Rao, 2004) when it comes to impact assessments of CBD interventions. The existing literature offers a limited number of scientific ways in which to assess the impact of CBD programs (World Bank, 2006). The use of RCTs in evaluating the impact of specific interventions on well-defined outcomes is increasingly preferred as a means of demonstrating impact (Banerjee and Duflo , 2008; Bjorkman and Svensson, 2009; Banerjee et al, 2010; Olken, 2007; Pandey et al, 2009). Although the methodologies within those studies are rigorous, the interventions assessed tend to be quite narrow, in order to ensure internal validity; this results in lower external validity. Joshi (2010) proposes that RCT results be supplemented by qualitative work that can unearth the processes associated with actual impacts.

According to Mansuri and Rao (2004), data on representative treatment and control groups—collected through baseline and follow-up surveys—are required, if we are to undertake the much-needed rigorous analysis of CBD impacts. This dissertation is an attempt to satisfy this need. Since this dissertation analyzes a case in Pakistan, I review in the next section the related literature pertaining to the Pakistani context.

1.3 Research on Community-based Development Interventions in Pakistan

Only a few studies focus on the CBD approach in Pakistan: Kurosaki and Khan (2012), Khan et al. (2011), Khwaja (2009), Cheema et al. (2006), Kurosaki (2005), and Kurosaki (2006). Among them, Khwaja (2009) can be considered the most influential and frequently cited one.

Khwaja (2009) uses data captured in the execution of community-managed infrastructure projects in the Northern Areas of Pakistan. The study investigates a random sample of community managed-projects completed by the Agha Khan Rural Support Programme (AKRSP) through the involvement of local communities.[5] The study shows that the adverse impact of prevailing inequality, social fragmentation, and lack of leadership in a community can be tackled through better project design. In other words, the study finds that a well-designed project produces better results, even in a community that possesses adverse attributes. The study identifies the impact based on specifications with community fixed effects; however, in Khwaja's dataset, some of the communities that implemented multiple projects were funded by a variety of donors—some of whom might have had different terms and conditions pertaining to postcompletion upkeep and maintenance. Such terms and conditions might have been adjusted owing to donors having learned the attributes specific to the community or region. Therefore,

[5] AKRSP has been implementing CBD interventions in the Northern Areas of Pakistan for decades. It networks strongly with the local communities and has the support of the general citizenry of the region.

these terms and conditions might have reshaped community behavior and resulted in different outcomes. For instance, some donors may ask for the imposition of stricter sanctions, subsequent to a community's failure to maintain the existing projects properly.[6] As such, within-community variations in project design, as examined by Khwaja (2009), were not exogenously imposed upon the communities; rather, they came about through an endogenous process of change in community behavior. In this sense, the study's claim that a good design should work in a "bad" community is too naïve and lacks external validity.

Moreover, Khwaja (2009) focuses on community-based infrastructure projects that are at a rather advanced stage in the CBD intervention cycle (Khan et al., 2011; Labonne and Chase, 2009); it does not take into account the number of preceding steps within the cycle (for example, project area(s) selection, CBO formation and maturity process and sanction of a community based infrastructure project). As only a few CBOs reach this stage, the external validity of findings by Khwaja (2009) may be in doubt.

Other studies of Pakistan have a focus slightly different from that of this dissertation. For example, the study of Cheema et al. (2006) involves in-depth descriptive analysis of reforms, introduced in Pakistan in 2000, that pertained to decentralization (an expected outcome of the CBD approach).[7] The authors describe the main aspects of the reforms and their evolutionary process from a historical perspective. Although useful, that study is not empirical and quantitative in nature. Moreover, Kurosaki (2005) investigates the citizen community boards (CCBs), with close resemblance to CBOs introduced in Pakistan in 2001.[8] That study empirically analyzes the conditions under which a CCB is likely to be established and prepare a project proposal; it does not, however, analyze the targeting performance and impact of CBD interventions.

[6] NGOs like AKRSP seldom offer an infrastructure project to communities with poor maintenance of existing project(s). In practice, community infrastructure projects are offered to communities as a reward for their good performance in other interventions offered by NGOs—for example, a high rate of microfinance repayment (Kurosaki and Khan, 2012). Besides, the communities with infrastructure projects have comparatively higher level ability of collective actions than those without it.

[7] The decentralization reforms were introduced by then military ruler, General Musharraf in 2000 and implemented in 2001.

[8] Following the successful formation of a CCB, its member could propose developmental schemes to the concerned local government. Subject to the approval of a scheme, funds equivalent to 80 percent of the scheme's cost are paid to the concerned CCB by the local government.

1.4 Contributions of This Dissertation

Given the paucity of empirical literature reviewed in the previous section, this dissertation focuses on CBD interventions in Pakistan, and thus contributes considerably to the existing body of literature. Two major research questions are addressed through this dissertation: whether CBD interventions are well-targeted towards the poor, and if yes, under what conditions; and whether CBD interventions result in improvements in the welfare of participants, and if yes, under what conditions. The empirically verifiable hypotheses to address these questions are explained in individual chapters below.

I analyze a case where interventions are implemented by a women-driven and women-focused NGO in Pakistan. This dissertation is unique by virtue of its focus on an NGO with these characteristics: Pakistan is a region known for its male domination, and women there are systematically excluded from participatory development owing to their weak bargaining power (Agarwall, 2001). The NGO operates in disaster-prone areas with the aim of reaching out to the environmentally vulnerable and poor, and hence alleviating their poverty through CBOs (henceforth referred to as community organizations, or COs[9]) at the grass-root level. Above all, this dissertation intends to employ rigorous empirical analysis, including RCTs that cover all essential stages of the CBD process and levels of CBD approach.

First, this dissertation comprehensively investigates the targeting performance of the Pakistani Hoslamand Khawateen Network (PHKN). The analysis contributes to the literature, given the current lack of such discussion in the case of Pakistan. I find that the PHKN has been able to target poorer villages and households; I also find that more highly educated and socially endowed households are more likely to join the PHKN.

Second, this dissertation undertakes in-depth analysis of the preference-matching process inherent in the CBD approach. Within-CO analysis of CO planning and PHKN response, with detailed data and quantitative analysis, is new to the literature. I find the overall preference-matching level of the PHKN not to be high, but it is free of elite capture. Moreover, females COs are at par with male COs, when it comes to preference matching. I also analyze the role of the PHKN facilitators.

[9] In Pakistan, the term "CO" is frequently used in reference to a CBO. For instance, the Pakistan Poverty Alleviation Fund (PPAF), the apex public sector donor and watchdog of CBD activities in Pakistan, officially uses the term "CO" in its project management guidelines. For this reason, the term "CO" has been adopted and broadly used by NGOs that follow the CBD approach in Pakistan.

Third, this dissertation assesses the impact of PHKN interventions, by using comprehensive datasets and various methodologies. Through its analysis, this dissertation expands the current literature by offering a better understanding of the welfare impacts of CBD activities. This type of information is particularly new in the Pakistani context. The analytical results show that PHKN's membership has improved the welfare of the member households in terms of women's empowerment, credit access, Zakat (Islamic charity) payment, and resilience to withstand micro-shocks. However, it has minimal impact on the consumption growth of its members. In addition to these analyses that use conventional survey-based methodologies, this dissertation also applies an RCT methodology design. To the best of my knowledge, this is one of the rare attempts in Pakistan to apply RCTs to the assessment of CBD activities. Moreover, none of the existing studies that relate to farm-household risks focuses on income losses owing to wild animal attacks in general and wild boar attacks (WBAs) in particular. This part of the dissertation also attempts a novel concept whether a CBD activity works when implemented outside the ambient of CBD by including nonmembers among its beneficiaries.

1.5 Structure of This Dissertation

This dissertation is offered in three major parts: an introductory part that comprises Chapters 1 and 2, a main analysis that consists of core chapters (Chapters 3–6), and a concluding part that comprises Chapter 7. The introductory part provides detailed background information with respect to the dissertation. The datasets used in this research are unique and compiled from original surveys, the details of which are provided in Chapter 2.

The core chapters flow in the following fashion. Chapter 3 investigates the targeting performance of the CBD approach; it also provides direction for the investigations that are carried out in the balance of the core chapters. After a CO is formed characterized by the selection process analyzed in Chapter 3, within-CO dynamics become especially important; therefore, Chapter 4 primarily investigates the preference-matching process, but also explores the possibility of elite capture in that process, and reveals how things happen within a CO. After a CO is formed and its activity plans prepared, PHKN interventions start to take place; identifying the impact of the interventions thus becomes important. Therefore, Chapters 5 and 6 focus on the impact assessment of PHKN interventions. Chapter 5 adopts a conventional methodology that uses survey data that pertains to past interventions. On the other hand, Chapters 6 employs an RCT design, which allows for the clean identification of impact through the randomized placement of interventions. Another new aspect of Chapter 6 is that the PHKN interventions also involve nonmembers.

Finally, the conclusion summarizes the findings of this dissertation; it also discusses possible directions for future research and proposes policy recommendations.

Chapter 2: Study Area and Data

2.1 Study Area

Pakistan is a country located in South Asia (Figure 2.1 – A). The country's human development is low with a current ranking of 145th among 169 countries, in terms of the Human Development Index (HDI) of the United Nations Development Programme (UNDP) (2011), slipping seven places in that ranking from its 2010 position. Pakistan's mean years of schooling and per-capita gross national income are 4.9 years and $2,550 (in 2005 purchasing power parity [PPP] dollars; see Table 2.1 for details), respectively.[10] According to HDI rankings, the country lags behind most of its neighboring countries in South-Asia. Approximately one-quarter of its total population was estimated to be living below the poverty line in the mid-2000s.[11] An increase in poverty is expected, owing to the rise in international grain prices (2008–10), the floods of 2010, and the torrential rains of 2011 (GOP, 2011). A great majority of the poor lack access to basic amenities and efficient credit sources (World Bank, 2002).

Khyber Pakhtunkhwa (KPK), known formerly as the North-West Frontier Province (N.W.F.P), is one of Pakistan's four provinces. The peculiar geopolitical and socioeconomic conditions of the province make it an interesting case. The province is economically backward, compared to the Punjab and the Sindh provinces, but is a little more affluent than the Baluchistan province. The province borders Afghanistan; it has therefore been the central stage for most Afghan conflicts, including the Soviet occupation and the more recent global war against terrorism. The Afghan conflicts have inflicted irreparable losses with respect to the province's economy, law and order, and social fabric,[12] which have in turn severely affected the capacity of an already resource-stricken provincial government to reach out to the poor and neglected regions of the province, and provide public goods and services like education, health, and basic amenities. This is evident from the fact that access in this province to improved drinking water and toilets is considerably worse than that suggested by national-level figures (Table 2.2). Moreover, prevailing conflicts and the subsequent economic meltdown has had a toll on the lives of children and women in the province, in particular (UN, 2003);[13] therefore, the province has the highest dependency ratio in the country (Table 2.2). Under such circumstances, the role of

[10] Cited on http://hdr.undp.org/en/media/HDR_2011_EN_Table1.pdf, accessed October 29, 2012

[11] The total population of Pakistan, as of mid-2010, was an estimated 173.5 million.

[12] According to the critics, these Afghan issues are believed to put tremendous pressure on the local economy, as it has involved around three million Afghan refugees, an increase in illegal weapons and militancy during the Soviet occupation, a deterioration in law and order, and the loss of scores of human lives—not to mention billions of USD in the Pakistani economy—subsequent to Pakistan joining the war on terrorism.

[13] The United Nations (UN), 2003, ACR Weekly Newsletter Vol.2, No.18 (April 30, 2003), Pakistan: UN Report on Impact of Violent Conflict on Women and Girls,
at http://acr.hrschool.org/mainfile.php/0125/122/, accessed October 29, 2012.

women-managed civil society organizations and NGOs that have a special focus on women and children becomes very important.

District Haripur has an area of 1,725 km^2 and a total population of 692,228, as per the 1998 census (Figure 2.1 – B).[14] As shown in Table 2.3, among individuals aged 10 years and older, the district has the highest literacy rate among the province's major districts. However, the district has poor access to basic civic facilities and amenities, like access to improved water (Table 2.3). According to the provincial government, one-third of the district's population lives below the poverty line.[15] Women's participation in the labor market is low, owing to low investment in human capital, social and family pressures regarding girls' education, and issues pertaining to the mobility of women.[16] The entire district is rain-fed, with the exception of the area with canal irrigation (i.e., one-third of its area). The district is highly susceptible to both natural and manmade disasters. Owing to the senseless degradation of the natural resource base, in recent years, the district has faced frequent flash floods, landslides, and WBAs.

2.2 Pakistani Hoslamand Khawateen Network (PHKN)

2.2.1 Introduction

The NGO I have chosen to examine in this dissertation is called the PHKN,[17] which came into being on June 10, 2000 and is led by Mrs. Irum Fatima, the current president. The PHKN's main project area comprises District Haripur of KPK province.[18] PHKN initiated its CBD activities in 2000 from a small village called Pind Hashim Khan, of District Haripur. At that time, the PHKN was called the Pind Hashim Khan Network, and it was a network of a small group of women with the shared goal of lifting up the lives of their fellow women, both socially and economically. Thanks to generous funding by both local and international donors, PHKN has experienced rapid growth. In recent years, PHKN has expanded its operations in several districts,

[14] This is the most recent population census in Pakistan. The population census was scheduled in 2011 but has not yet been completed, and no data has been released to date. According to KPK authorities, the population of the district in 2010 was estimated to be 1,265,799. This figure was culled from the KPK's official website (http://www.khyberpakhtunkhwa.gov.pk/aboutus/Area-Population.php), accessed May 15, 2011.

[15] Cited from http://www.khyberpakhtunkhwa.gov.pk/aboutus/Area-Population.php, accessed May 15, 2011.

[16] Cited from http://www.statemaster.com/encyclopedia/Haripur-District and http://www.sungi.org/situation_analysis_of_district_haripur.html, both accessed May 11, 2011.

[17] The Pakistani Hoslamand Khawateen Network (PHKN) is an Urdu name, the closest English-language approximation of which is "Pakistan's Courageous Women Network."

[18] The headquarters of PHKN are also situated in District Haripur. (A district is a basic unit of local administration that comes under the jurisdiction of a province.)

with its focus being on District Haripur.[19]

Bearing in mind the difficult working conditions inherent in the project area (i.e., those that exact tremendous physical and psychological stress), the PHKN seems to be doing a great job of specifically targeting women through its CBD interventions. However, as described in Chapter 1, these interventions are susceptible to elite capture—in particular, the social status of the women who lead the CBOs may increase the chances of such capture. Hence, it will be interesting to investigate empirically how PHKN interventions impact the lives of the underprivileged and most vulnerable segments of Pakistani society. It is worth mentioning here that the PHKN has a strong presence in its project area; therefore, I can safely relate the empirical findings of this dissertation directly to the activities PHKN.

2.2.2 PHKN's community-based development process

The PHKN follows a CBD approach, in which residents of a village or a commune are organized into a CBO or CBOs. In the case of PHKN, such CBOs are called COs; therefore, in the balance of this dissertation, I use the term "CO" in place of "CBO." To be eligible for PHKN interventions, a village or commune must have a CO or COs.

Generally, a PHKN intervention involves the following steps. First, the PHKN approaches village heads or peer leaders (e.g., village elders, school teachers, locally elected members, and religious leaders), in what is called the initial contact. Along with this contact, the PHKN staff members conduct a baseline assessment of the area that comprises its communal data; they also undertake a basic-needs assessment. The PHKN follows three possible routes in approaching a village or commune. First, a potential village is identified by PHKN staff members, through the use of secondary information. Second, the PHKN is approached by the district administration (e.g., social welfare, agriculture, health, education, and livestock departments) or local politicians; the PHKN is then asked to engage a village or commune in CBD activities. Third, the peer leaders of a village or commune may approach the PHKN and request an initial contact. In practice, the PHKN most frequently takes the first of these three routes to initial contact.

Soon after the initial contact, the PHKN holds several rounds of meetings with peer leaders, local communities, and stakeholders. The stage involving the meetings is called the first dialogue, and the details thereof are recorded in the PHKN logbooks. A CO is formed upon the

[19] At the time of the baseline survey, the PHKN had activities in the Districts Haripur, Abbottabad, Mansehra, Kohistan, and Lower-Dir of KPK. The PHKN also had limited outreach in the Federally Administered Tribal Areas (FATA) of Pakistan.

fulfillment of the minimum qualification criteria and after having garnered support among an appropriate number of villagers. This stage is called the second dialogue, and during it, community development tools such as participatory rapid appraisal (PRA) and village resource mapping are used to identify the developmental needs and priorities of the CO members; the CO leadership (i.e., the president, secretary, and activists) is elected and its capacity is built so that it can manage the CO (i.e., record-keeping, accounting, and savings management). During the third dialogue, all PHKN interventions (e.g., provision of microfinance [MF], HRD training, micro-infrastructure projects [MIPs], etc.) are implemented.

Once a CO is formed through the aforementioned steps and is registered with the PHKN, it commences its normal functions. Usually, a CO holds monthly meetings, during which its members discuss PHKN activities, major issues pertaining to their village or commune, and future plans to address those issues. The meetings also provide a public platform for collecting savings from CO members. CO savings records are kept in individual savings accounts. Apart from the leadership's training, all COs are provided with equal opportunities to access HRD training, through which the PHKN aims to disseminate income-earning and microenterprise management skills among CO members. It is worth mentioning that HRD is an integral part of the PHKN's mission statement, and hence, constitutes an essential component of its core objectives. The types and number of HRD training sessions vary among COs, in line with each community's unique training needs.

In villages where formal educational institutions are lacking, the PHKN occasionally extends support to community-based schools. Similarly, the PHKN may be helpful in training and mobilizing informal health workers—e.g., traditional birth attendants (TBAs)—in villages that have poor health facilities. PHKN staff members remain in close contact with local communities by making frequent CO visits. During such visits, besides checking CO logbooks, PHKN staff members have in-depth discussions with CO members regarding their most pressing issues.[20]

The PHKN invests large amounts of funding on two major types of intervention, that is, MF and MIPs. A CO is supposed to contribute around 20 percent of the total cost of a sanctioned MIP. The PHKN gauges the performance of a CO by its total amount of savings and uses that savings amount as a yardstick to advance MF and/or sanction an MIP.[21] Sometimes, the savings might be diverted towards an MIP or its upkeep cost, as CO members' individual contributions. CO

[20] See Khan et al. (2011) for further details.

[21] On the other hand, where there is a dire need, the needs consideration may override the allocation principle, based on the CO savings. I observed a few cases in which a CO with a poor savings record but great need nonetheless received PHKN services.

savings are sometimes used in internal lending, to help a CO member in times of financial hardship.[22]

The description of PHKN's CBD process suggests a strong link between PHKN personnel (facilitators) and village peer leaders (local elite, as well as CO leadership), and that between the local elite and common villagers (CO members). These links suggest the possibility of elite capture and other influences, thus making this dissertation an interesting research case.

2.3 Survey Design

To accomplish the core objectives of this dissertation, I use a dataset compiled from six surveys that had been implemented in collaboration with PHKN; Table 2.4 summarizes those six surveys. As the main data source, I use in the analysis a two-year panel dataset of villages and households, comprising the baseline and follow-up surveys of the PHKN.

The baseline survey comprises three tiers, that is, village, CO, and household-level surveys.[23] The village survey is an attempted census, including both villages with and without the COs, that is, villages with and without PHKN coverage. The village-level survey attempted to cover all villages that were (potential) target areas of PHKN. For administrative reasons, I was not able to obtain valid information from two villages in District Haripur. On the other hand, since PHKN activities target several neighboring villages, two villages in District Mansehra and four villages in District Abbotabad were also surveyed. Therefore, 105 observations of villages, of which 99 are located in District Haripur, are included in the baseline village survey. The baseline CO data comprise all 90 registered COs of the PHKN at the time of the baseline survey. The baseline household survey is a sample survey that covers 583 households distributed across the CO member households (categorized as *T*-group) in CO villages and nonmember households, in both CO (categorized as C_1-group) and non-CO villages (categorized as C_2-group). See Table 2.5 for the distribution of the sample households.

The resurvey of the three groups of households (*T*-group, C_1-group, and C_2-group) and their respective villages was conducted in the follow-up survey. Out of the 583 baseline sample households, I was able to resurvey 571 households. I replaced these 12 attritted households. Out of the 571 households resurveyed, two changed their PHKN membership status. For the main

[22] Internal loans are sanctioned only when a two-thirds majority of the members present in a CO meeting approves the loan request. By the time of the follow-up survey, I had not encountered even a single case of internal lending.

[23] Analysis of the three-tier baseline survey data is given by Khan et al. (2011).

analysis using the household panel data, I use the subsample of 569 households that were surveyed in both benchmark and follow-up surveys and maintained the same membership status. Details regarding the distribution of sample households are available in Table 2.5. It is worth mentioning that owing to financial constraints, I had to decide whether to collect total income or consumption data from the sample households during the baseline and follow-up surveys. I preferred consumption data, as it is considered a better measure of welfare than income (Deaton and Zaidi, 2002).

During the time of the resurvey, another survey was conducted to record the meeting proceedings of the registered COs, over a one-year period (from September–October 2010 to November 2011) in which a CO resolution was approved. The final database of COs' meeting records includes records of 253 meetings for the registered COs of PHKN.[24] The meeting records are used for the analysis of dynamics within a CO (intra-group dynamics).

The resurvey of sample households provides additional information on treatments to mitigate crop losses because of WBAs, participation in the Benazir Income Support Programme (BISP),[25] food security, ethnicity, and relationship with local elite (e.g., village head). Of particular interest to this dissertation are data on PHKN interventions vis-à-vis WBAs, which are provided on the basis of the RCT design. In early 2011, PHKN provided capacity-building training with the intention of mitigating crop-income loss owing to WBAs; this training was offered to a randomly chosen subset of eligible households.

During November–December 2012, I implemented the third round of the household survey. All households that were covered in the second round were successfully resurveyed in the third round. In the future, I intend to incorporate data of the third round in some of the quantitative analysis of the dissertation.

2.4 Sample Characteristics

Detailed tables of summary statistics are provided and discussed in each chapter of this dissertation. In this section, I offer an overview of the characteristics of the study villages, COs, and sample households.

Survey #1 comprises village data, containing more than 200 variables that characterize the

[24] These COs also include nine nonfunctional COs.
[25] BISP is a one-of-a-kind, government-funded intervention program that provides cash transfers, capacity-building, and insurance coverage, among other things, to poor and vulnerable households.

villages surveyed. The dataset contains information on 105 villages (99 villages are in District Haripur; the rest are in District Abbotabad or Mansehra); see Section 3.2 and Table 3.1 in Chapter 3 for details. Most of these villages are highly dependent on agriculture, as far as the labor force is concerned. The occupation-based distribution of the population in the villages is consistent with that at the national level, and the adult literacy rate in the sample villages is almost at par with provincial and national-level figures. Most of the sample villages are rain-fed, and they have poor access to amenities like natural gas, cable TV, and internet access. Overall access to formal health and education facilities is also quite low in the villages. The survey also captured information on the existence of dispute-settlement forums (DSFs) in the villages, and the systems of local governance. The systems here consist of traditional DSFs, that is, *jirga,* and nontraditional or parallel DSFs.[26]

From survey #2, I compile a dataset of 90 COs. See Section 4.2 and Table 4.1 of Chapter 4 for details of the information therein. Small villages have one female CO and one male CO, at most, while large villages may have several female (male) COs. Usually, a CO covers one or a few *mohallas* (a commune or geographic subunit of a village), distinct from the other *mohallas* covered by COs within the same village. Owing to social and cultural constraints, males and females have separate COs. Almost three-quarters of the COs are run by women; this is a unique feature of the PHKN, and in studying it, this dissertation serves as a special case study in the context of the male-dominated society of Pakistan. As far as PHKN's major interventions are concerned, all COs have benefitted from HRD training,[27] about one-third of the COs have received an MIP,[28] and about one-quarter of the COs have availed MF.[29]

The benchmark household survey (Survey #3) data contain more than 500 variables and represent 583 sample households; see Section 3.2 and Table 3.2 of Chapter 3 for details. The household dataset also contains individual-level information such as age, gender, relationship to

[26] A *jirga* is a council of local elders that helps settle local disputes.

[27] By combining all kinds of HRD training, it does become apparent that all COs have received such training. The average number of training sessions per CO is six. The HRD training sessions are classified into three types, namely, leadership and managerial skill development training, nonconventional HRD training, and natural disaster management training. The average expenditure per CO for HRD training is in excess of PKR 300,000 (PKR: Pakistani rupees; see footnote 54, below).

[28] The size of each of these MIPs ranges from PKR 175,000 to PKR 855,000, with its mean at PKR 500,000. One of the popular MIP fields is water and sanitation. When an MIP is implemented in a village, not only CO members but also nonmembers benefit from the project. It is estimated that the number of nonmember beneficiary households are almost twice the number of beneficiary member households.

[29] Credit is advanced to individual members, with the average loan size being in excess of PKR 6,500. In addition to the three major interventions, DSFs represent important CO activities facilitated by the PHKN. The CO data include information on common social forums (CSFs), including mosques, *bethak* (a traditional guesthouse), and *hujra* (a traditional place of socialization used by men). Some variation also exists in the use of local DSFs. The quantitative analysis of these CO performance indicators is left for future analysis.

the household head, work status, education status, and health status; it covers 3,600 members. The overall characteristics of the sample households are comparable to those of the villages studied.

Figure 2.1 (A)

Map of Pakistan (inset Map of Khyber- Pakhtunkhwa – KPK Province)

Figure 2.1 (B)

Map of District Haripur (inset: Map of KPK Province)

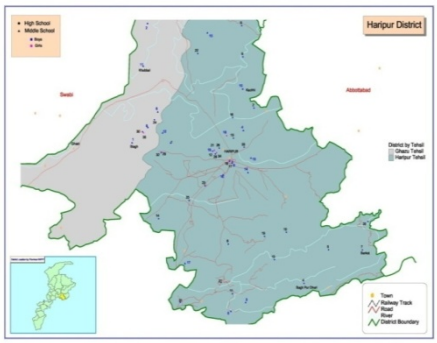

Table 2.1

Comparison of Khyber-Pakhtunkhwa (KPK) with other provinces

HDI Rank (2011)	Country	Human Development Index Value	Life expectancy at birth (years)	Mean years of schooling (years)	Expected years of schooling (years)	Gross national income (GNI) per capita (constant 2005 PPP $)	GNI per capita rank minus HDI rank	Non-income HDI Value
97	Sri Lanka	0.691	74.9	8.2	12.7	4,943	12	0.768
134	India	0.547	65.4	4.4	10.3	3,468	–10	0.568
145	Pakistan	0.504	65.4	4.9	6.9	2,550	–7	0.526
146	Bangladesh	0.500	68.9	4.8	8.1	1,529	11	0.566

Note: The table has been prepared by the author after accessing data from the following source.

Source: UNDP, cited on http://hdr.undp.org/en/media/HDR_2011_EN_Table1.pdf, accessed on October 29, 2012.

Table 2.2

Comparison of Khyber-Pakhtunkhwa (KPK) with other provinces

Level/Indicator	Dependency ratio*	Household size*	Literacy Rate (age 10+ years)**			Access to improved water source***	Access to toilet**
			Total	Male	Female		
Punjab	85.82	6.4	60	70	51	83	72
Sindh	84.09	6.6	59	71	46	76	62
Khyber-Pakhtunkhwa	97.50	6.7	50	68	33	58	62
Baluchistan	94.62	8.1	41	60	19	88	31
National	-	8.0	58	69	46	88	66

Note: The table has been prepared by the author after accessing data from the following sources;

* Population census, 1998

**Pakistan Social and Living Standards Measurement (PSLM) 2010-11 [where literacy is defined as ability to read and write a simple letter]

***PSLM 2008-09 [where literacy is defined as ability to read and write a simple letter]

Cited on;

http://www.pbs.gov.pk/sites/default/files/pslm/publications/pslm_prov2010-11/tables/2.14a.pdf, access date, November 02, 2012.

Table 2.3

Comparison of Haripur with neighboring district and provincial capital

Level/Indicator	Dependency ratio*	Household size*	Literacy Rate (age 10+ years)**			Access to improved water source***	Access to toilet**
			Total	Male	Female		
Abbottabad	85.82	6.40	69	81	59	83	65
Haripur	84.09	6.60	70	84	57	76	80
Mansehra	97.50	6.70	58	74	45	58	66
Peshawar	94.62	8.10	54	68	38	88	81
Provincial	-	-	50	68	33	73	62
National	-	8.00	58	69	46	88	66

Note: The table has been prepared by the author after accessing data from the following sources;

* Population census, 1998

**Pakistan Social and Living Standards Measurement (PSLM) 2010-11 [where literacy is defined as ability to read and write a simple letter]

***PSLM 2008-09 [where literacy is defined as ability to read and write a simple letter]

Cited on;

http://www.pbs.gov.pk/sites/default/files/pslm/publications/pslm_prov2010-11/tables/2.14a.pdf, accessed on November 2, 2012.

Table 2.4

Summary of Six Surveys

S. #	Survey	Description	Survey Period	Type (Census / Sample)	Reference Period	No. of Obs.
1.	Village benchmark survey	Survey of villages with and without COs, i.e. CO and non-CO villages	September - October, 2010	Attempted Census*	The survey date	105 (Villages)
2.	CO benchmark survey	Survey of all registered COs	September - October, 2010	Census	The survey date	90 (COs)
3.	Household benchmark survey	Survey of sample member (T) and non-member (C1 & C2) households from CO and non-CO villages, respectively	November - December, 2010	Sample	The survey date, except for non-food and food expenditure with a reference period of one week and one year, respectively	583 (Households)
4.	Village re-survey	All those villages in which household survey was administered	November - December, 2011	Sample	The survey date and changes during one year since the village benchmark survey	41 (Villages)
5.	Household re-survey	Re-survey of households covered in the household benchmark survey	November - December, 2011	Sample	The survey date and changes during one year since the household benchmark survey (except for food expenditure with a reference period of one week)	583 (Households)
6.	COs Meeting Record	Meeting proceedings of all registered COs held between October 2010 and November 2011, in which a CO resolution was approved	November - December, 2011	Census	One year until the survey date	253 (Meetings)

* Two villages in Haripur District were not covered due to administrative reasons.

Table 2.5

Distribution of Sample Households by Treatment Status

Categories/Level	Treatment Group (T)	Control Group 1 (C1)	Control Group 2 (C2)	Total
Number of villages covered in the baseline household survey	21	19[a]	20	41
Number of COs covered in the baseline and follow-up household surveys	50	n.a.	n.a.	50
Number of households covered in the baseline household survey	249	234	100	583
Number of baseline sample households that were also covered in the follow-up household survey and the membership status did not change	248	233	88	569
Number of baseline sample households that were also covered but found with membership status changed in the follow-up household survey	1	1	0	2
Number of replacement households added in the follow-up household survey	0	0	12	12

Notes:

a. These 19 villages are the subset of 21 villages to which the treatment households in the baseline survey belonged. In two villages of the 21 villages, no control households were surveyed, since the majority of households in the villages were already CO members.

Chapter 3: Targeting Performance of Community-based Development Interventions

3.1 Introduction

Besides other positive contributions,[30] the CBD approach is expected to improve targeting performance, as the use of local knowledge can improve targeting and reduce program placement costs (Mansuri and Rao, 2004). Furthermore, the use of local knowledge is expected to bear greater relevance in a situation where credible monetary data for potential use in targeting activities are not available. According to Alatas et al. (2012), in developing countries—where the majority of potential target group is employed in the informal sector—the availability of verifiable income records is always an issue. Therefore, it is difficult to identify target group by employing conventional targeting techniques such as means tests. For these reasons, identification through the CBD approach is expected to improve targeting.

However, the absence of institutional support and/or homogeneity within a community may diminish the usefulness of local information. In the absence of local governance institutions, it is difficult to ensure accountability in the course of implementing CBD initiatives in decentralized settings. For instance, according to Conning and Kevane (2002), within-community heterogeneity may result in a variety of perceptions vis-à-vis poverty, and this may adversely impact targeting performance. The situation becomes worse when the perceptions of donors (i.e., governments, NGOs, multilateral donors, and philanthropists) with regard to poverty differ from those of the local community. These conditions may create an environment conducive to elite capture.

In addition, even when the CBD approach is able to target poorer villages, it may fail in reaching out to the poor households within each village (Mansuri and Rao, 2004), which can be termed as "poor targeting or mistargeting". For instance, the study of Galasso and Ravallion (2001)—whose motivation closely resembles that of this chapter—investigates the targeting performance of the "Food-for-Education (FFE) Program" in Bangladesh. The targeting mechanism adopted for the program comprises two stages: selection of the participating *Union Parishads*[31] by the central government (henceforth referred to as the "center"), and the identification of eligible households by the communities concerned. By employing both household and community-level data, Galasso and Ravallion identify the factors that can

[30] The CBD approach is also expected to contribute to the decentralization of power; the creation of high-quality, low-cost public goods; and empowerment. These, however, are not the focus of this chapter.
[31] A *Union Parishad* on average consists of about 15 villages.

potentially influence targeting by the center and the community. The study shows that the larger a program is, the lower the levels of land inequality and remoteness therein are, the lower the number of shocks is, and also the lower private redistribution of transfers is, the more within-village targeting improves. Furthermore, the decision-making ability of the community potentially has a strong influence on the program outcomes, and the results show that the center's program placement did not take into account village attributes that may potentially help in reaching out to the poor.

Given these findings within the literature, this chapter attempts to garner a better understanding of targeting performance. First, I employ village and household-level data that contains an array of geographic, socioeconomic, demographic, and vulnerability-related measures, to analyze targeting performance. The list of variables therein is more comprehensive than any adopted in the existing literature. Second, some of the parameters—like networking with the local elite and environmental vulnerability—are used here for the first time, to analyze the targeting performance of CBD interventions. In assessing the performance of targeting, I define "good" targeting as the success of PHKN in placing its programs in poor villages (in terms of lower adult literacy, poor access to basics amenities, higher level of susceptibility to the natural disasters, etc.) and reaching out to the poor households (poorer access to basic civic services and environmental vulnerability). This is because the aim of PHKN is to improve the livelihood of poor and vulnerable households and there is a consensus among PHKN leadership and villagers that these indicators are relevant proxy for the poverty and vulnerability.

The rest of this chapter is organized in the following manner. Section 3.2 describes the data, and Section 3.3 elaborates the empirical strategy used in the analysis. Section 3.4 comprises a comparison of villages with and without COs, and that of households belonging to the two sets of village through inter-village targeting analysis[32], while Section 3.5 compares the treated and control households by intra-village targeting analysis. Section 3.6 concludes the chapter.

3.2 Data

I employ two datasets in my analysis; in this section, I provide detailed descriptions of them.

3.2.1 Benchmark village-level data (Survey #1 of Table 2.4, Chapter 2)

I present in Table 3.1 summary statistics for all 105 villages, comprising both villages with (henceforth referred to as "CO villages") and without (henceforth referred to as "non-CO villages") COs, covered through the survey—99 of which are in District Haripur, and the

[32] CO and non-CO villages will be explained in subsection 3.2.1

remainder of which are in District Abbotabad or Mansehra. Village size, based on population, ranges from 140 to 8,245. Over one-half of each village's population relies entirely on agriculture for subsistence; 20 percent of the population is employed by the services sector. The occupation-based distribution of the populations of the villages is consistent with that at the national level. The literacy rate in the surveyed villages exceeded 54 percent, which also aligns with both provincial and national-level averages. The sample villages are mostly rain-fed; 28 percent of them that are canal-irrigated. This suggests a strong link between agricultural output and precipitation level. Therefore, in such areas, abrupt changes in rainfall may cause either crop failure or flash floods. Differences in literacy rate and/or access to canal irrigation among the CO and non-CO villages may suggest prevailing poverty in both sets of villages; they may also be helpful in assessing the PHKN's targeting performance.

The study area presents a gloomy picture, as far as access to amenities is concerned. Only one-fifth of the villages have access to natural gas, while one-quarter have cable TV and internet access. Essential components of the rural market place—namely, grocery shops called *Karyana* shops, vegetable shops, and fruit shops—show large across the village variations. Village-level disparities in access to these amenities might also be useful in assessing the PHKN's targeting performance.

Overall, access to formal basic-health facilities is very low in the villages. For instance, only 16 percent of the villages have at least one basic health unit (BHU). The villages instead tend to have access to informal facilities of basic health, e.g., over 80 percent of the villages have at least one trained TBA. When it comes to formal education facilities, around 87 percent of the villages have at least one primary school, 35 percent have at least one middle school, and 21 percent have at least one high school. To fill any gaps in terms of formal educational institutions, there exist decent numbers of informal educational institutions, e.g., community-based schools and *Deni-Madrassahs* (religious schools). It will be interesting to see in further analysis how these formal and informal facilities of health and education, endogenous to the PHKN interventions, vary across the CO and non-CO villages. I intend to use these endogenous factors as robustness checks to assess PHKN targeting performance.

To investigate the existence of a local-governance system,[33] the village survey captures information regarding the existence of DSFs. The system comprises traditional DSFs, that is, *Jirga,* and nontraditional or parallel DSFs. A great majority of the villages have one of these two

[33] It will be interesting to investigate the extent to which village-level targeting has been influenced by the local-governance system. Unfortunately, I have no access to data vis-à-vis the purely exogenous variable of local governance.

types of DSF. It will be worth investigating how the system varies across the CO and non-CO villages.

More than 88 percent of villages have been affected by the 2010 floods.[34] Because of exogenous characteristics of flood, it is used as a rough proxy to capture the susceptibility of villages to natural disasters before PHKN interventions. Moreover, it will be interesting to see how damages owing to floods vary across the CO villages and non-CO villages.

3.2.2 Household benchmark survey data (Survey #3 of Table 2.4, Chapter 2)

In Table 3.2, I present separately the summary statistics of the key variables under seven major categories. According to the demographics, the average household size is 6.2 members, which is smaller than the national average of 7.20. The female–male ratio is 1.14, which is better than that national level female–male ratio of 0.93. Moreover, around 9 percent of the sample households are headed by a female.

The average years of schooling among household members and heads are only 5.7 and 5.9 years, respectively. The male members, on average, have higher levels of education than the female members, with the difference between the former and the latter consisting of at least one year of school. Around 76 percent of the adult population of the sample households is literate, which is quite high in comparison to the national average of 54 percent. According to the results, the female literacy rate is lower than that of males, by at least 10 percentage points; this household-level disparity in education between male and female members is a reflection of male domination in the study area.

The housing conditions—e.g., flooring (*h_floor*) and access to drainage (*drainge*)—suggest that a considerably large proportion of the sample households is poor. Furthermore, household-level access to natural gas, internet, and cable TV is considerably lower than that at the village level, suggesting substantial within-village variation in actual use of these services. The major physical assets—e.g., land and livestock—have an unequal across the household distribution, which is reflected in large standard deviations with respect to these variables. I consider housing conditions and land ownership exogenous to PHKN interventions, while livestock ownership and access to amenities are endogenous.

[34] In July–August 2010, Pakistan experienced the worst floods in its history. The floods badly affected 84 of the 121 districts of the country, and affected the lives of more than 20 million people (i.e., one-tenth of Pakistan's population). The floods resulted in more than 1,700 human fatalities, and damage to or destruction of around 1.8 million homes (UN, 2010, p.1).

Two variables under the rubric of "susceptibility to natural disasters" show that 34 percent of the households have been affected by the 2010 floods, while an equal percentage of households have registered losses owing to WBAs.

To show the social status of the sample households and their networking with the local elite, I use three dummy variables: native household (*native*); social status of the household (*sol_status*); and relationship with the local elite, both blood and nonblood (*networking*). More than 93 percent of the sample households are native and enjoy high social status, while 36 percent of the same network with the local elite.

3.3 Empirical Strategy

To assess the targeting performance of the CBD approach, I test the two following hypotheses. First, I test H_1: whether CO villages are systematically poorer and more vulnerable than non-CO villages. As a statistical test, I employ the null hypothesis: observable characteristics of CO villages and non-CO villages are the same. Second, I test H_2: whether CO members (T-group) are systematically poorer and more vulnerable than nonmembers (C1-group) in CO villages. As a statistical test, I employ the null hypothesis: observable characteristics of *T*-group and C_1-group households in CO villages are the same. I test the hypotheses at the village or household level, as appropriate: H_1 can be tested at the village and household level, while H2 can be tested only at the household level.

If, in the course of testing H_1, I find that CO villages are poorer than non-CO villages, say the CO villages have lower adult literacy, access to basic amenities, and higher susceptibility to the natural disasters, etc., I will conclude that the PHKN targets poorer villages. This finding would reflect the net effect of two mechanisms: that the PHKN endogenously approaches poorer villages, and that poorer villages select themselves in approaching the PHKN. Although I cannot cleanly identify the mechanisms separately, I attempt this separation by using different definitions of "CO village," as explained below. Similarly, while testing H_2, if I find that member households are different from the nonmember households in a CO village, say the members have lower access to the amenities and higher vulnerability to natural disasters than the nonmember, etc., I will infer that the former are poorer than the latter.

To focus on targeting—rather than on impact—throughout this chapter, I will analyze the predetermined and exogenous factors that reflect the targeting performance of the PHKN.[35]

[35] The factors endogenous to PHKN interventions are introduced into the analysis only as robustness checks, particularly in village-level multivariate analysis.

3.3.1 Inter-village targeting analysis

In this subsection, I attempt to test H_1, which involves comparison of between; i. villages with COs ("CO villages") and villages without COs ("non-CO villages"), and ii. households belonging to CO villages and non-CO villages. I use data captured through Survey #1 and #3 in the analysis. I test H_1 both at the village and household level, and in the process conduct bivariate and multivariate analyses.

Through implementing i, I show the relative importance of PHKN placement or village self-selection in its community mobilization process (see subsection 2.2 of Chapter 2 for further details). I do this by altering the definitions of "CO villages" and "non-CO villages" (more on this later, in the subsection covering village-level bivariate analysis), and hence show the role of the PHKN's placement or a village's self-selection in the community mobilization. On the other hand, to implement ii, I compare the $T + C_1$-group (CO village households) and the C_2-group (non-CO village households) in bivariate and multivariate analysis.

3.3.2 Intra-village targeting analysis

To test H_2, I conduct a bivariate comparison followed by multivariate analysis of the T-group (member households in CO villages) and the C_1-group (nonmember households in CO villages) by employing household data solely from the CO villages. In conducting the Intra-village analysis to test H_2, I also add village fixed effects to the list of explanatory variables, in order to cleanly test H_2.

3.4 Inter-Village Analysis (Comparison of CO Villages and Non-CO Villages)

In this section, I discuss the results of the inter-village bivariate and multivariate analyses by employing key variables that relate to both sets of villages and households belonging to them.

3.4.1 Bivariate comparison of CO and non-CO villages

I compare the means of the variables described in subsection 3.2.1. As a robustness check, I employ two sets of non-CO villages: those from all districts (N = 65), and those solely from District Haripur (N = 59).

In this subsection, I examine different dimensions of the empirical strategy by which to address

potential concerns that may arise at various analytical levels. As mentioned in subsection 3.2.1, 99 of the 105 survey villages are in District Haripur; the rest are from either the Abbotabad or Mansehra District. It may be possible that the six villages belonging to Abbotabad or Mansehra are different from those in Haripur (N = 99), in terms of some unobservable attributes. Therefore, to address this concern and to provide a robustness check, I employ the full sample, as well as a subsample of the Haripur villages, in the bivariate analysis.

I also employ other robustness checks in the bivariate analysis. For instance, I use a number of definitions for "CO villages," among which is the default definition of the "CO villages", which refers to a list of the PHKN villages with a CO or similar activities. The PHKN list of CO villages also includes villages lacking a registered CO. I check the robustness of the analysis by repeating bivariate analysis with a narrower definition of the "CO villages", which refers to the villages with a registered CO.[36] I consider this a better measure by which to capture PHKN targeting performance. As an alternative measure, I employ a broader category of the "CO villages" by adding the villages contacted by the PHKN, but which failed to form a CO and hence are not included among the "CO villages". Henceforth, the group of villages formed is referred to as the wider definition of "CO villages". To identify pure placement by the PHKN, the use of the wider definition of "CO villages" to assess targeting performance might be superior to the use of the default definition of the villages. Therefore, I employ the wider definition as another robustness check.

Bearing in mind the alternative definitions of the CO and the data[37] available, I adopt dichotomous classifications, with 40 CO villages as per the default definition[38], 24 CO villages as per the narrower definition, and 60 as per the wider definition[39] (see the first rows of Table 3.3).

I show in Table 3.3, separately, the means of the CO villages and non-CO villages, as derived through statistical tests of equality. In line with their demographic attributes, CO villages are characterized by a literacy rate lower than that of non-CO villages—by at least 8 percentage points, in fact. Both village types are similar in terms of their population. Non-CO villages have

[36] The villages with a registered CO are also considered to fall under the default definition of "CO villages."
[37] Had I a larger sample size with which to work, I would have compared four types of villages, namely, the villages contacted by the PHKN, but which failed to form a CO; the villages with a registered CO or similar activities, but which are currently lacking a registered CO; the villages with a registered CO; and all others. However, in using the current dataset, these categories would have contained only 20, 16, 24, and 45 observations, respectively—numbers too small for our purposes.
[38] This equals 16, plus 24 villages.
[39] Here, the 60 villages equal 20, plus 16, plus 24.

a higher level of diversification in terms of occupational structure, which is an indication of their higher standard of living.[40]

The two sets of villages are similar in terms of their access to basic amenities like clean drinking water and roads by which to access the market. However, the two sets of villages are noticeably different in terms of accessibility to natural gas, cable TV, and internet. The results of the analysis show that the non-CO villages have better access to the aforementioned amenities, which are generally associated with economically better-off areas. The non-CO villages tend to have more grocery shops called *Karyana* shops—although the difference is significant only when there is a control group comprising all non-CO villages, and hence a better village market place. These factors suggest that CO villages are poorer than non-CO villages.

I find there to be no difference between the two sets of villages vis-à-vis access to formal health facilities. However, the CO villages have much better access to informal health services, e.g., trained TBAs.[41] The villages are also similar in terms of the availability of formal and informal educational facilities. The two village types are similar in terms of their access to formal education facilities; however, the CO villages have better access to informal education facilities—e.g., community-based schools—than do non-CO villages. The overwhelmingly strong presence of informal institutions and facilities in the CO villages suggests minimal presence and/or effectiveness of government at grass-root level in the study area.

DSFs provide a basis for local governance. No difference is found between the CO and non-CO villages in terms of the presence of a traditional DSF (e.g., *jirga*)—a characteristic exogenous to PHKN interventions and is evenly spread across all the villages. However, the number of nontraditional DSFs in CO villages is significantly larger than that in non-CO villages;[42] this reflects the strong presence in the CO villages of local-governance institutions essential to the effective use of local information, the presence of accountability, and hence better targeting performance (Mansuri and Rao, 2004).

Last but not the least is the incidence of damage owing to the 2010 floods. The damages were higher among CO than non-CO villages; this suggests that CO villages tend to be more vulnerable to natural disasters.

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[40] However, the occupational difference becomes insignificant when villages in Abbotabad and Mansehra are excluded.

[41] This is endogenous to PHKN interventions. As mentioned previously, in this chapter, endogenous factors are not employed for impact-assessment purposes; they are used only for identification purposes and as robustness checks.

[42] This illustrates PHKN's facilitation in bringing about a local-governance system that is more inclusive than traditional institutions. Analysis in this vein is left to future research.

As a robustness check, I segregate non-CO villages belonging to the districts of Abbotabad or Mansehra from the other non-CO villages. I followed with bivariate comparison between then-formed non-CO villages (in column C of Table 3.3) and CO villages, along with the full sample, in Table 3.3. Subsequently, contrast between the two sets of villages become slightly weaker.

As further robustness checks, I present in Appendix Table 3.1 the results of bivariate analysis based on narrower or wider definitions of CO villages. For these analyses, I adopt the dichotomous classifications that involve 40 CO villages[43] as per the default definition, 24 CO villages as per the narrower definition, and 60 CO villages[44] as per the wider definition; details thereof are shown in the first rows of Appendix Table 3.1. According to the robustness checks, no qualitative difference is observed once the wider definition of "CO villages" is employed for the analysis (Appendix Table 3.1). The results suggest that a major component of the net correlation between village characteristics and PHKN placement is the placement effect, that is, it is purely targeting by PHKN, and not village self-selection, that results in CO formation within a village.

In the course of summarizing the results of the bivariate analysis, it becomes clear that PHKN has been able to target poorer villages that feature lower adult literacy rates and limited access to amenities like natural gas, cable TV, and internet services. Moreover, it is also clear that the CO villages are more susceptible to natural disasters.

An especially promising finding of the bivariate analysis is that CO villages have better access to community-based schools, TBAs, and nontraditional DSFs. Since these attributes are potentially endogenous to PHKN interventions, I employ these attributes in multivariate analysis, but only as robustness checks.[45]

3.4.2 Multivariate comparison of CO and non-CO villages

Before proceeding further, it is worth noting that multivariate analysis is meant to be used solely for descriptive purposes. In this subsection, I employ simple linear probability models in the analysis. I use a dummy variable representing a CO in a village as a dependent variable, while a

[43] This equals 16, plus 24 villages.
[44] Here, the 60 villages are derived from 20, plus 16, plus 24.
[45] One way to deal with endogeneity issues is to collect recall data for these endogenous factors, i.e. community-based schools, TBAs, and nontraditional DSFs, which is left for future research.

number of key variables from Table 3.1 serve as explanatory variables.[46] Owing to the small sample size and inherent multicollinearity issues, I opt for a reduced-form regression model.[47] I also include in the multivariate analysis a dummy variable that represents the districts of Abbotabad and Mansehra, as a robustness check.

I report the regression results in Table 3.4 and Appendix Tables 3.2 (A–B). In Model 1, I employ time-invariant variables that are clearly determined prior to PHKN interventions, with the objective of analyzing only the selection effect. I include some potentially endogenous variables in Models 2–5, but only as robustness checks. The aforementioned endogenous variables are nontraditional DSFs (*dsf*), availability of community-based schools (*cbsch*), and availability of TBAs (*tba*).

The results of the multivariate analysis—as shown in Table 3.4 and Appendix Tables 3.2 (A–B)[48]—agreement with those of the bivariate analysis, with varying levels of statistical significance. The results support, in a robust manner, early findings regarding the CO villages. Once I control for other factors, the literacy rate is no longer associated with the presence of a CO in a village. The pattern of pro-poor targeting persists, as suggested by the coefficients of the variables that represent access to natural gas, internet access, and grocery shops, and susceptibility to disasters.[49] These results provide slightly weaker evidence than that suggested through the bivariate analysis.

Strikingly, the variable representing the length of the road connecting a village with a major market (*rd_length*) becomes significant in multivariate regressions. The coefficient of the variable is statistically significant and bears a negative sign. This suggests that CO villages are more likely to be at shorter distances from a major market than non-CO villages, when controlling for other factors. In other words, this is a reflection of a cost-minimization strategy on the part of PHKN—especially in the wake of rising transportation costs.

When I add the potentially endogenous variables (*dsf*, *cbsch*, and *tba*) to Models 2–5, positive and significant correlations are derived; this accords with the results of the bivariate analysis. Moreover, the inclusion of the potentially endogenous variables does not qualitatively alter

[46] For the sake of consistency, I report results of the linear probability model. Moreover, the Probit results are quite similar to the results reported.
[47] A number of variables have a potential association with some other variables, or do not show variation in the bivariate comparison; they are not included as explanatory variables in multivariate analysis.
[48] The 15 specifications in the three tables robustly support the findings of the bivariate analysis.
[49] The results are statistically significant in several, but not all, specifications.

coefficients on the more predetermined variables.[50]

To conclude this section, a village that is closer to a major market, lacks amenities, and is prone to natural disasters is more likely to form a CO. This suggests that the overall targeting by PHKN is pro-poor. The results of both bivariate and multivariate analysis support H_1, that is, CO villages are symmetrically different from non-CO villages. In the next subsection of the chapter, I attempt to test H_1, at the household-level.

3.4.3 Bivaraite comparison of households in CO villages and households in non-CO villages

I present household-level bivariate comparison in Tables 3.5 . Table 3.5 compares the $T + C_1$-group (CO village households) and the C_2-group (non-CO village households), to test H1.

According to Table 3.5, the two sets of households are similar in terms of demographic and educational attributes. However, I find a sharp contrast between the $T + C_1$-group and the C_2-group, based on their assets; seven of the eight differences are statistically significant, albeit at various significance levels. The $T + C_1$-group households are poorer than those in the C_2-group in terms of housing conditions (i.e., house flooring and access to drainage), quality of landholdings (i.e., value of land), and access to amenities (i.e., gas, radio, internet, and cable TV). Moreover, the results show a striking contrast between the $T + C_1$-group and the C_2-group, based on the variable *radio*. The use of radio is higher among $T + C_1$-group households than those in the C_2-group. In the age of television and the internet, radio use among households in the $T + C_1$-group is a reflection of their poverty. It is not surprising, then, that the bivariate analysis shows that the $T + C_1$-group households are poorer than C_2-group households; alternatively, this difference might be because of village-level selection (both PHKN placement and village self-selection). In any case, the negative selection effect is more likely to persist at the household level.[51] Moreover, $T + C_1$-group households are highly vulnerable to shocks (e.g., WBAs), compared to the C_2-group; this result reflects village-level PHKN placement and supports my earlier claim of pro-poor targeting by the PHKN, that is, the PHKN can successfully reach out to environmentally vulnerable segments of society, both across and within villages. A larger number of $T + C_1$-group households are native, compared to the C_2-group households; however, among the former, there is a lower proportion of households

[50] A careful comparison of Model 1 with each of Models 2–5 shows no qualitative difference among the coefficients of the predetermined variables. Moreover, rigorous analysis to determine the causal impact of PHKN interventions will be undertaken in Chapters 5 and 6 of this dissertation.

[51] The negative selection effect of PHKN interventions will be investigated further, in Chapter 5.

with higher social status. Both of the aforementioned characteristics suggest that CO villages are homogenous and the least socially empowered, which once again reaffirms the PHKN's claim that it targets the marginalized segments of Pakistani society. I find there to be an interesting difference between the $T + C_1$-group and the C_2-group households, based on their networking with the local elite. The $T + C_1$-group has better networking with the local elite than the C_2-group households; this is consistent with my earlier predictions, in Chapter 2, of the possibility of elite capture (vis-à-vis the social mobilization process of PHKN). Hence, $T + C_1$-group households are poorer than C_2-group households and are highly susceptible to disasters and shocks. Hence, the results of bivariate analysis support H_1.

In summary, the bivariate test supports H_1, subject to the outcome of multivariate tests in the next subsection.

3.4.4 Multivariate comparison of households in CO villages and households in non-CO villages

To examine the results of the bivariate analysis while controlling for other factors, I regress a dummy that represents the $T + C_1$-group households against C_2-group households, as well as a set of predetermined village and household-level variables from Tables 3.4 and 3.5. I report the regression estimates in Table 3.6. The coefficients on most of the explanatory variables bear signs as per expectations.

I find a difference between the $T + C_1$-group and C_2-group households that is almost similar to one seen in bivariate analysis. A significantly small proportion of $T + C_1$-group households are using natural gas for cooking (at the 1-percent significance level), while a significantly larger proportion of the same exhibit radio ownership and usage (at the 1-percent significance level), compared to C_2-group households. C_2-group households have better land holdings, in terms of land value, than $T + C_1$-group households; moreover, $T + C_1$-group households have strong networking with the local elite (at the 1-percent significance level) in comparison to C_2-group households.

I also introduce into Model 1, as robustness checks, dummies that represent the literacy rate and years of education for female and male members (shown in Tables 3.6). The results (given in Models 2 and 3) robustly support those of Model 1.

To summarize findings of section 3.5, villages whose households have poor access to basics amenities (e.g. natural gas), low quality landholdings (in terms of land value) and strong networking with local elite are more likely to have a CO. Hence, these findings support H_1, both

at village and household level.

3.5 Intra-Village Analysis (Comparison of Treated and Control Households)

This section comprises in-depth analysis that focuses on how the demographic and socioeconomic attributes of the households distributed across the *T*-group, the C_1-group and the C_2-group households. The objective of the exercise is to "narrow down" the targeting performance analysis, that is, to bring it from the village level to the household level. The existing literature is fraught with household-level mistargeting on the part of CBOs, indicating successful village-level but poor household-level targeting performance (Mansuri and Rao, 2004).

3.5.1 Bivariate comparison of member and non-member households within the CO villages

I compare the *T*-group (member households) and the C_1-group (nonmember households) in the CO villages and report results in Table 3.7, to test H_2.

The bivariate comparison of the *T*-group and the C_1-group households shows that two groups are similar in their demographics, asset holdings, and income indicators (Table 3.7). The two groups of households also have similar educational attributes, save for average years of schooling among male members of the households. The *T*-group households have slightly better male education than C_1-group households, at the 10-percent significance level. In other words, the households in the CO villages that have relatively higher male education are more likely to become members of a CO, which is common in practice. On the other hand, the *T*-group households are more vulnerable to natural disasters and shocks (i.e., both floods and WBAs), compared to those in the C_1-group; I interpret this as an outcome of self-selection, that is, the households prone to natural disasters, even within the same village, are more likely to join a CO. As far as the social characteristics of the two groups of households are concerned—like social status and networking—the *T*-group and C_1-group households are similar in terms of social status. Hence, CO villages are homogeneous in terms of the social status of their inhabitants, but heterogeneous in terms of networking with the local elite. Hence, the results suggest that the *T*-group households are different from C_1-group households, and H_2 might hold, subject to the outcomes of multiple analyses.

In summary, the bivariate test supports and H_2, subject to the outcome of multivariate tests in the next subsection.

3.5.2 Multivariate comparison of member and non-member households within the CO villages

I regress a dummy that represents *T*-group households as the dependent variable on a set of household-level variables from Table 3.7, as well as all village dummies as explanatory variables, for a subsample of CO villages. I report the regression estimates in Tables 3.8. The coefficients on most of the explanatory variables bear the expected signs.

The results of multivariate tests (shown in Table 3.8) confirm that *T*-group households have higher literacy and education (among male members only) than those of the C_1-group, but the difference is statistically significant only for education, in other words, households with highly educated males are more likely to become CO members. The test results also indicate that a significantly smaller proportion of *T*-group households use natural gas for cooking (at the 1-percent significance level), while a significantly higher proportion of the same are susceptible to natural disasters and shocks (at the 5-percent significance level) than C_1-group households that poorer and environmentally vulnerable are more likely to be treated. Strikingly, *T*-group households have better access to cable TV (at the 1-percent significance level) than C_1-group households—a finding that was insignificant in the bivariate analysis. I interpret this finding as more aware and socially sensitized are more likely to become CO members owing to their access to independent and vibrant electronic media on cable TV than state run terrestrial TV network. Given these findings, I can safely accept H_2, that is, CO members in CO villages are systematically different from nonmembers in CO villages, i.e. CO member households are poorer than non-member households.

I also introduce into Model 1, as robustness checks, dummies that represent the literacy rate and years of education for female and male members (shown in Tables 3.8). The results (given in Models 2 and 3) robustly support those of Model 1.

To conclude this section, H_2 is accepted on the basis of multivariate test results showing a clear difference betweenmember and non-member households in a CO villages.

3.6 Conclusion

The findings described in this chapter suggest that CO villages are systematically different from non-CO villages. More specifically, the PHKN has been able to target poorer villages. The CO villages are characterized by lower adult-literacy rates, limited access to basic amenities, and higher susceptibility to natural disasters.

Villages whose households are poorer in terms of access to amenities are more likely to have a

CO. Villages where level of literacy among its households is high and networking with the local elite is strong are more likely to form a CO.

On the other hand intra-village targeting analysis shows that member households are also systematically different from nonmember households in CO villages, in terms of access to basic amenities; additionally, the latter are more vulnerable to natural disasters than the former. Hence, the PHKN has been able to reach out to environmentally vulnerable households. Within CO villages, households with literate males and households with better networking are also more likely to be a member.

To conclude, PHKN has been able to target not only poorer villages but also poorer households. The higher likelihood of more socially endowed households joining PHKN may raise concerns vis-à-vis potential elite capture, which I will investigate further in Chapter 4. With the current village-level dataset, I was not able to separately identify the endogenous placement effect and the self-selection effect. In future research, I intend to overcome this shortcoming of data by having further rounds of surveys and through collection of recall data.

Table 3.1
Summary statistics of village-level variables

Description	Variable	Mean	Std. Dev.	Min	Max
Classification of villages					
Haripur District (a dummy representing District Haripur, main project area of PHKN)	d_haripur	0.943	dummy	0	1
Abbottabad District (a dummy representing District Abottabad, a neighboring district of Haripur)	d_abbotabad	0.038	dummy	0	1
Mansehra District (a dummy representing District Mansehra, a neighboring district of Haripur)	d_mansehra	0.019	dummy	0	1
CO village (default definition)	d_co1	0.381	dummy	0	1
CO village (narrower definition)	d_co2	0.229	dummy	0	1
CO village (wider definition)	d_co3	0.571	dummy	0	1
Demography					
Adult literacy rate (%age)	lit_rate	54.33	18.96	5	95
Village Population	vil_pop	2474.95	1812.49	140	8245
Profession (%age of total population): agriculture	agri_prof_~c	53.29	22.49	0	92
Profession (%age of total population): services	services	20.09	15.51	0	80
Profession (%age of total population): self empl.	self_emp	7.79	8.40	0	50
Profession (%age of total pop.): non-farm labor	lab_nform	12.92	11.93	0	90
Profession (%age of total population): others	other_prof	5.91	7.11	0	40
Basic amenities, infrastructure, and shops					
Connection to canal irrigation (a dummy which take a value equals to one if the village is connected with canal irrigation, otherwise 0	irrigated_~e	0.276	dummy	0	1
Length of the road (in km) connecting the village with a major market	rd_length	14.98	12.44	1	50
Clean drinking water availability (%age of total village population)	cln_drnk_wa	74.56	31.56	0	100
Availability of gas connection in the village (a dummy for natural gas access to the village)	gas	0.210	dummy	0	1
Availability of cable TV connection (a dummy for cable TV access to the village)	c_tv	0.267	dummy	0	1
Availability of internet connection	i_net	0.257	dummy	0	1
Karyana shop - (a dummy representing availability of grocery shop in the village)	kar_shop	0.819	dummy	0	1
Vegetable shop	veg_shop	0.543	dummy	0	1
Fruit shop - (a dummy representing availability of fruit shop in the	frt_shop	0.390	dummy	0	1
Existence of medical facilities in the village					
Basic Health Unit (Govt) - (a dummy for BHU in the village)	bhu	0.162	dummy	0	1
Rural Health Center (Govt) - (a dummy for RHC in the village)	rhu	0.048	dummy	0	1
Doctor's presence in BHU or RHC - (a dummy for availability of RHC in the village)	dr_bhu_rhu	0.181	dummy	0	1
Traditional birth attendant (TBA) - (a dummy for availability of TBA in the village)	tba	0.714	dummy	0	1
Existence of education institutions in the village					
Primary school dummy (1st to 5th grades)	prim_school	0.867	dummy	0	1
Middle school dummy (6th to 8th grades)	mid_sch	0.352	dummy	0	1
High school dummy (9th to 10th grades)	hi_scho	0.219	dummy	0	1
Community based school dummy	cbsch	0.152	dummy	0	1
Deni Madrassah - DM (Religious School) dummy	d_madra	0.457	dummy	0	1
Dispute settlement forums (DSF)					
Jirga - traditional DSF - (dummy showing availability of traditional DSF)	jirga	0.800	dummy	0	1
Non-traditional DSF - (dummy showing availability of non-traditional	dsf	0.829	dummy	0	1
Locally elected representative is from the village - dummy	ler	0.705	dummy	0	1
Susceptibility to natural disasters					
Village is prone to disaster (Yes=1, No=0)	dis_prone_~l	0.886	dummy	0	1

Note:
1. The number of observations is 105.
2. The table are prepared by the author.

Table 3.2
Summary statistics of household-level variables

Description	Variable	Mean	Std. Dev.	Min	Max
Demography					
Number of household members	hhsize	6.17	2.69	1	16
Ratio of female members over male members	fem_rate	1.14	0.87	0	5
Dummy for a female-headed household	fem_hh	0.086	dummy	0	1
Years of education of the household head	hh_edu	5.92	4.37	0	16
Literacy status of the household head	hh_lite	0.732	dummy	0	1
Age of the household head	hh_age	49.72	13.99	20	90
Education$					
Years of education of the household member	educ_yrs	5.69	2.29	0	14
Years of education of the female member	fem_edu	2.24	1.70	0	9
Years of education of the male member	mal_edu	3.64	1.89	0	11
Adultl literacy	d_lit	0.76	0.24	0	1
Female literacy	fem_lite	0.33	0.21	0	1
Male literacy	mal_lite	0.43	0.20	0	1
Household asset indicators					
The flooring of the house is paved or not (Yes=1, No=0)	h_floor	0.123	dummy	0	1
The house has drainage (Yes=1, No=0)	drainge	0.429	dummy	0	1
The house is connected with gas for cooking (Yes=1, No=0)	gas	0.081	dummy	0	1
Value of land owned by the hh (Rs.1,000,000)	land_val	0.579	1.492	0	25
Value of livestock owned by the hh (Rs.1,000,000)	livestock_~l	0.034	0.067	0	0.857
The household has and uses a radio (Yes=1, No=0)	radio	0.300	dummy	0	1
The household uses internet (Yes=1, No=0)	internet	0.005	dummy	0	1
The house is connected with cable TV (Yes=1, No=0)	cab_tv	0.014	dummy	0	1
Susceptibility to natural disasters					
The household was affected by 2010 floods (Yes=1, No=0)	fldaffecte~h	0.343	dummy	0	1
The household suffered damages due to attacks by wild boars (Yes=1, No=0)	wildboar_a~l	0.338	dummy	0	1
Social status and networking					
Native household (Native=1, Non-native=0)	native	0.938	Dummy	0	1
Social status of the household (High=1, Low=0)	sol_status	0.935	Dummy	0	1
Networking of the household with local elite in terms of blood or non-blood relation with local elite (Yes=1, No=0)	networking	0.365	Dummy	0	1

Note: 1. The number of observations is 583. 2. The table are prepared by the author.
* The adult equivalent units we used are: 0.25 for infants (age<=5), 0.5 for children (age>5 & age<=14), 0.8 for teenagers (age>14 & age<=18), 0.9 for female adults (age>18 & age<=60), 1.0 for male adults (age>18 & age<=60), and 0.8 for the elderly (age>60).
$ variable are household level averages

Table 3.3
Comparison of CO villages and non-CO villages (Village-level, bivariate analysis)

Variable	Mean for each group			Difference (A)-(B)		Difference (A)-(C)	
	(A) CO villages (n =40)	(B) Non-CO villages, all (n =65)	(C) Non-CO villages, Haripur (n =59)	Mean	(S.E.)	Mean	(S.E.)
Demography							
lit_rate	49.13	57.54	57.03	-8.41 **	(3.86)	-7.91 **	(3.90)
vil_pop	2252	2612	2475	-360	369	-223	373
agri_prof_~c	55.28	52.06	55.66	3.21	(4.36)	-0.39	(4.22)
services	16.80	22.11	21.31	-5.31 *	(2.97)	-4.51	(2.96)
self_emp	5.60	9.14	6.93	-3.54 **	(1.47)	-1.33	(1.08)
lab_nform	15.10	11.58	11.58	3.52	(2.29)	3.52	(2.37)
other_prof	7.23	5.11	4.53	2.12	(1.65)	2.70	(1.63)
Basic amenities, infrastructure, and shops							
irrigated_~e	0.250	0.292	0.322	-0.042	(0.090)	-0.072	(0.093)
rd_length	14.13	15.51	16.75	-1.38	(2.22)	-2.62	(2.31)
cln_drnk_wat	71.38	76.52	76.17	-5.15	(6.64)	-4.79	(6.73)
gas	0.025	0.323	0.254	-0.298 ***	(0.064)	-0.229 ***	(0.062)
c_tv	0.175	0.323	0.288	-0.148 *	(0.084)	-0.113	(0.085)
i_net	0.100	0.354	0.339	-0.254 ***	(0.077)	-0.239 ***	(0.079)
kar_shop	0.725	0.877	0.864	-0.152 *	(0.082)	-0.139	(0.084)
veg_shop	0.625	0.492	0.458	0.133	(0.100)	0.167	(0.101)
frt_shop	0.325	0.431	0.390	-0.106	(0.097)	-0.065	(0.099)
Existence of medical facilities in the village							
bhu	0.125	0.185	0.186	-0.060	(0.072)	-0.061	(0.074)
rhu	0.025	0.062	0.051	-0.037	(0.039)	-0.026	(0.038)
dr_bhu_rhu	0.125	0.215	0.220	-0.090	(0.074)	-0.095	(0.076)
tba	0.825	0.646	0.644	0.179 **	(0.085)	0.181 **	(0.087)
Existence of education institutions in the village							
prim_school	0.850	0.877	0.881	-0.027	(0.070)	-0.031	(0.071)
mid_sch	0.325	0.369	0.339	-0.044	(0.096)	-0.014	(0.097)
hi_scho	0.250	0.200	0.186	0.050	(0.085)	0.064	(0.086)
cbsch	0.250	0.092	0.102	0.158 **	(0.078)	0.148 *	(0.080)
d_madra	0.475	0.446	0.407	0.029	(0.101)	0.068	(0.103)
Dispute settlement forums (DSF)							
jirga	0.850	0.769	0.780	0.081	(0.078)	0.070	(0.079)
dsf	0.925	0.769	0.780	0.156 **	(0.067)	0.145 **	(0.069)
ler	0.650	0.738	0.712	-0.088	(0.094)	-0.062	(0.097)
Susceptiblity to natural disasters							
dis_prone_~l	0.975	0.831	0.831	0.144 ***	(0.053)	0.144 **	(0.055)

Notes: 1. The standard errors are reported in parenthesis, estimated under the assumption that allow unequal variance of two groups. 2. The definition of a CO village is the default definition (listed as having a CO or similar activities in the PHKN village list). 3. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. 4. The table is prepared by the author.

Table 3.4

Correlates of participation (village-level multiple regression results)

	Dependent variable: CO village - dummy *(d_co1)*				
	Model 1	Model 2	Model 3	Model 4	Model 5
Village-level variables					
lit_rate$	-0.0020	0.0000	-0.0010	-0.0020	0.0000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
vil_pop/1000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.000	0.000	0.000	0.000	0.000
agri_prof_prc	-0.0020	-0.0030	-0.0040	-0.0030	-0.0040
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Basic amenities, infrastructure, and shops					
irrigated_village	-0.0420	-0.0440	-0.0700	-0.0980	-0.1150
	(0.139)	(0.137)	(0.136)	(0.139)	(0.134)
rd_length	-0.013**	-0.014**	-0.013**	-0.012**	-0.012**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
cln_drnk_wat	0.0000	0.0000	0.0000	-0.0010	-0.0010
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
gas	-0.3730	-0.380*	-0.436*	-0.354*	-0.419*
	(0.195)	(0.179)	(0.193)	(0.177)	(0.175)
i_net$	-0.2180	-0.2140	-0.1980	-0.2380	-0.2140
	(0.182)	(0.167)	(0.172)	(0.172)	(0.162)
kar_shop	-0.1600	-0.1580	-0.1500	-0.1930	-0.1770
	(0.151)	(0.157)	(0.147)	(0.134)	(0.140)
Access to education and medical facilities					
prim_school	-0.0490	-0.0310	-0.0520	-0.0600	-0.0480
	(0.144)	(0.146)	(0.144)	(0.137)	(0.139)
mid_sch	-0.0730	-0.0740	-0.0750	-0.1110	-0.1060
	(0.111)	(0.109)	(0.110)	(0.113)	(0.111)
hi_scho	0.0950	0.0590	0.0860	-0.0060	-0.0190
	(0.154)	(0.157)	(0.152)	(0.155)	(0.155)
d_madra	0.1520	0.1600	0.1030	0.1590	0.1190
	(0.116)	(0.116)	(0.112)	(0.116)	(0.113)
bhu	0.0960	0.0350	0.0650	0.0900	0.0230
	(0.164)	(0.165)	(0.164)	(0.158)	(0.156)
Susceptibility to natural disasters					
dis_prone_vil$	0.2550	0.2830	0.1970	0.2980	0.2570
	(0.156)	(0.155)	(0.159)	(0.152)	(0.155)
Potentially endogenous variables					
dsf		0.246*			0.1640
		(0.118)			(0.130)
cbsch			0.289*		0.260*
			(0.138)		(0.128)
tba				0.312**	0.252*
				(0.097)	(0.104)
Intercept	0.852**	0.5630	0.926**	0.679*	0.5860
	(0.284)	(0.310)	(0.290)	(0.299)	(0.329)
R-squared	0.291	0.321	0.327	0.352	0.393
F-statistics	6.045	4.503	6.985	5.901	8.110
Level of Significance	0.000	0.000	0.000	0.000	0.000
No. of Obs	105	105	105	105	105

Notes: 1. In addition to those explanatory variables listed above, intercept, Mansehra dummy, and Abbottabad dummy are also included. 2. Estimated by OLS (linear probability model), with robust standard errors (reported in brackets). 3. The number of observations is 105. 4. * p<0.1, ** p<0.05, *** p<0.01 . 5. $ Variables were found highly significant in bivariate analysis. 6.The table is prepared by the author.

Table 3.5
Comparison of CO villages and non-CO villages (household-level, bivariate analysis)

Variable	Mean for each group		Difference (T+C1) -(C_2)	
	(T+$C1$) member household and non-member household in CO villages (n=483)	(C_2) Household in non-CO villages (n=100)	Mean	(S.E.)
Demography				
hhsize	6.11	6.51	-0.40	(0.32)
fem_rate	1.13	1.20	-0.07	(0.11)
fem_hh	0.09	0.05	0.04	(0.03)
hh_edu	5.90	6.00	-0.10	(0.49)
hh_lite	0.74	0.71	0.03	(0.05)
hh_age	49.67	49.98	-0.31	(1.48)
Education				
educ_yrs	5.620	6.044	-0.42	(0.28)
fem_edu	2.187	2.505	-0.32	(0.19)
mal_edu	3.579	3.933	-0.35	(0.23)
d_lit	0.767	0.717	0.05 *	(0.03)
fem_lite	0.335	0.298	0.04	(0.02)
mal_lite	0.433	0.419	0.01	(0.02)
Household asset indicators				
h_floor	0.11	0.21	-0.10 *	(0.04)
drainge	0.38	0.66	-0.28 ***	(0.05)
gas	0.00	0.46	-0.46 ***	(0.05)
land_val	0.47	1.12	-0.65 **	(0.29)
livestock_~l	0.02	0.01	0.00	(0.00)
radio	0.33	0.18	0.15 ***	(0.04)
internet	0.00	0.03	-0.03 *	(0.02)
cab_tv	0.00	0.06	-0.06 **	(0.02)
Susceptibility to natural disasters				
fldaffecte~h	0.37	0.40	-0.03	(0.05)
wildboar_a~k	0.35	0.27	0.08 **	(0.05)
Social status and networking				
native	0.973	0.770	0.20 ***	0.043
sol_status	0.921	1.000	-0.08 ***	0.012
networking	0.439	0.010	0.43 ***	0.025

Notes: 1. The standard errors are reported in parenthesis, estimated under the assumption that allow unequal variance of two groups. 2. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. 3. The table is prepared by the author.

Table 3.6

Correlates of participation (household-level multiple regression results)

	Model 1	Model 2	Model 3
	Dependent Variable:		
Explanatory Vars	Dummy representing T+C1-Group Household		
Village-level variables			
lit rate	-0.003	-0.003	-0.003
	(0.003)	(0.003)	(0.003)
vil pop	0	0	0
	0.000	0.000	0.000
agri_prof_~c	-0.002	-0.002	-0.002
	(0.001)	(0.001)	(0.001)
rd_length	0	0	0
	(0.008)	(0.008)	(0.008)
cln drnk wat	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)
Household education			
d lit	0.052		
	(0.055)		
fem lite		0.059	
		(0.060)	
mal lite		0.044	
		(0.065)	
fem edu			0
			(0.005)
mal edu			-0.001
			(0.007)
Household asset indicators			
h floor	0.041	0.041	0.043
	(0.040)	(0.040)	(0.041)
drainge	-0.054	-0.054	-0.052
	(0.037)	(0.037)	(0.038)
gas	-0.690***	-0.691***	-0.691***
	(0.132)	(0.132)	(0.133)
land val	-0.027**	-0.027**	-0.027**
	(0.008)	(0.008)	(0.009)
radio	0.051*	0.051*	0.052*
	(0.023)	(0.023)	(0.024)
internet	-0.151	-0.147	-0.141
	(0.141)	(0.141)	(0.142)
cab tv	-0.04	-0.04	-0.038
	(0.090)	(0.090)	(0.090)
Household level susceptibility to natural disasters			
fldaffecte~h	-0.025	-0.025	-0.025
	(0.025)	(0.025)	(0.025)
wildboar a~k	0.037	0.038	0.039
	(0.028)	(0.029)	(0.028)
Household level social status and networking			
native	0.296**	0.296**	0.299**
	(0.104)	(0.104)	(0.104)
sol status	-0.081	-0.08	-0.081
	(0.047)	(0.046)	(0.047)
networking	0.137*	0.137*	0.138*
	(0.054)	(0.054)	(0.054)
Intercept	0.809***	0.812***	0.840***
	(0.214)	(0.214)	(0.210)
R-squared	0.578	0.579	0.578
F-statistics	71.067	68.376	68.953
Level of Sig.	0.000	0.000	0.000
Number of Obs.	583	583	583

Notes: 1. Dependant variable is dummy which represents surveyed households from CO-villages. 2. Standard errors in parentheses. 3. * p<0.05, ** p<0.01, *** p<0.001. 4. The table is prepared by the author.

Table 3.7
Comparison of CO member and non-member households (multivariate analysis)

Variable	Mean for each group		Difference (T)-(C_1)	
	(T) CO member household (n =249)	(C_1) Non-member household in CO villages	Mean	(S.E.)
Demography				
hhsize	6.18	6.02	0.16	(0.24)
fem_rate	1.15	1.11	0.04	(0.08)
fem_hh	0.08	0.11	-0.03	(0.03)
hh_edu	6.21	5.57	0.64	(0.40)
hh_lite	0.76	0.71	0.05	(0.04)
hh_age	49.30	50.06	-0.77	(1.29)
Education				
educ_yrs	5.755	5.476	0.279	(0.20)
fem_edu	2.181	2.194	-0.013	(0.15)
mal_edu	3.731	3.416	0.315 *	(0.17)
d_lit	0.771	0.764	0.006	(0.02)
fem_lite	0.329	0.341	-0.012	(0.02)
mal_lite	0.442	0.423	0.019	(0.02)
Household asset indicators				
h_floor	0.120	0.090	0.031	(0.03)
drainge	0.394	0.368	0.026	(0.04)
gas	0.000	0.004	-0.004	(0.00)
land_val	0.503	0.429	0.074	(0.09)
livestock_~l	0.015	0.016	-0.001	(0.00)
radio	0.329	0.321	0.009	(0.04)
internet	0.000	0.000	0.000	(0.00)
cab_tv	0.008	0.000	0.008	(0.01)
Susceptibility to natural disasters				
fldaffecte~h	0.43	0.30	0.13 ***	(0.04)
wildboar_a~k	0.40	0.30	0.09 **	(0.04)
Social status and networking				
native	0.980	0.966	0.014	0.015
sol_status	0.908	0.936	-0.028	0.024
networking	0.382	0.500	-0.118 ***	0.045

Notes: 1. The standard errors are reported in parenthesis, estimated under the assumption that allow unequal variance of two groups. 2. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. 3. The table is prepared by the author.

Table 3.8
Correlates of participation (household-level multiple regression

	Model 1	Model 2	Model 3
	Dependent Variable:		
Explanatory Vars	Dummy representing T-Group Household		
Household Education			
d lit	0.025		
	(0.062)		
fem lite		-0.016	
		(0.084)	
mal lite		0.073	
		(0.101)	
fem edu			0.002
			(0.010)
mal edu			0.020*
			(0.009)
Household level susceptibility to natural disasters			
h floor	0.105	0.102	0.089
	(0.066)	(0.063)	(0.064)
drainge	0.042	0.042	0.038
	(0.046)	(0.047)	(0.046)
gas	-0.380***	-0.373***	-0.386***
	(0.037)	(0.039)	(0.038)
land val	-0.002	-0.003	-0.007
	(0.013)	(0.015)	(0.015)
radio	0.007	0.007	0.003
	(0.041)	(0.042)	(0.043)
cab tv	0.479***	0.487***	0.472***
	(0.057)	(0.058)	(0.076)
Household level susceptibility to natural disasters			
fldaffecte~h	0.107*	0.108*	0.110*
	(0.046)	(0.047)	(0.043)
wildboar a~k	0.094*	0.091*	0.087
	(0.042)	(0.041)	(0.042)
Household level social status and networking			
native	0.272	0.267	0.255
	(0.133)	(0.132)	(0.131)
sol status	0.021	0.022	0.015
	(0.042)	(0.041)	(0.040)
networking	-0.111	-0.112	-0.11
	(0.088)	(0.088)	(0.087)
Village fixed affect	Yes	Yes	Yes
Intercept	0.118	0.113	0.088
	(0.151)	(0.152)	(0.137)
R-squared	0.075	0.076	0.079
Number of Obs.	483	483	483

Notes: 1. Dependant variable is dummy for member households. 2. 483 households represents both T and C1 group households (a subsample of households belonging to CO villages only). 3. Standard errors in parentheses. 4. * p<0.05, ** p<0.01, *** p<0.001. 4. The table is

Appendix Table 3.1
Comparison of CO villages and non-CO villages under different definitions of a "CO village"

	Narrower definition of CO villages				Wider definition of CO villages			
	Difference: (A: CO villages)-(B: Non-CO, all)		Difference: (A: CO villages)-(B: Non-CO, Haripur)		Difference: (A: CO villages, all)-(B: Non-CO, all)		Difference: (A': CO villages, Haripur)-(B: Non-CO, Haripur)	
Variable	Mean	(S.E.)	Mean	(S.E.)	Mean	(S.E.)	Mean	(S.E.)
Demography								
lit_rate	-12.37 ***	(3.92)	-11.94 ***	(3.96)	-12.37 ***	(3.92)	-7.91 **	(3.90)
vil_pop	-484.00	(418.59)	-374.18	(421.06)	-484.00	(418.59)	-223.17	(372.95)
agri_prof_~c	-2.64	(4.83)	-5.62	(4.73)	-2.64	(4.83)	-0.39	(4.22)
services	-5.67 *	(3.24)	-4.99	(3.23)	-5.67 *	(3.24)	-4.51	(2.96)
self_emp	-3.19 **	(1.30)	-1.40	(1.03)	-3.19 **	(1.30)	-1.33	(1.08)
lab_nform	6.15 **	(2.78)	6.16 **	(2.82)	6.15 **	(2.78)	3.52	(2.37)
other_prof	5.35 **	(2.42)	5.84 **	(2.41)	5.35 **	(2.42)	2.70	(1.63)
Basic amenities, infrastructure, and shops								
irrigated_~e	-0.088	(0.099)	-0.112	(0.101)	-0.088	(0.099)	-0.072	(0.093)
rd_length	3.54	(2.16)	2.67	(2.22)	3.54	(2.16)	-2.62	(2.31)
cln_drnk_wat	-11.58	(8.03)	-11.36	(8.08)	-11.58	(8.03)	-4.79	(6.73)
gas	-0.272 ***	(0.050)	-0.213 ***	(0.048)	-0.272 ***	(0.050)	-0.229 ***	(0.062)
c_tv	-0.292 ***	(0.067)	-0.265 ***	(0.068)	-0.292 ***	(0.067)	-0.113	(0.085)
i_net	-0.333 ***	(0.053)	-0.320 ***	(0.054)	-0.333 ***	(0.053)	-0.239 ***	(0.079)
kar_shop	-0.198 *	(0.105)	-0.187 *	(0.107)	-0.198 *	(0.105)	-0.139	(0.084)
veg_shop	0.160	(0.113)	0.187	(0.114)	0.160	(0.113)	0.167	(0.101)
frt_shop	-0.182 *	(0.106)	-0.150	(0.107)	-0.182 *	(0.106)	-0.065	(0.099)
Existence of medical facilities in the village								
bhu	0.006	(0.088)	0.007	(0.089)	0.006	(0.088)	-0.061	(0.074)
rhu	-0.008	(0.048)	0.002	(0.047)	-0.008	(0.048)	-0.026	(0.038)
dr_bhu_rhu	-0.073	(0.082)	-0.075	(0.083)	-0.073	(0.082)	-0.095	(0.076)
tba	0.262 ***	(0.078)	0.263 ***	(0.080)	0.262 ***	(0.078)	0.181 **	(0.087)
Existence of education institutions in the village								
prim_school	0.011	(0.079)	0.008	(0.079)	0.011	(0.079)	-0.031	(0.071)
mid_sch	0.029	(0.114)	0.055	(0.115)	0.029	(0.114)	-0.014	(0.097)
hi_scho	0.148	(0.107)	0.160	(0.108)	0.148	(0.107)	0.064	(0.086)
cbsch	0.073	(0.093)	0.062	(0.094)	0.073	(0.093)	0.148 *	(0.080)
d_madra	-0.106	(0.115)	-0.078	(0.116)	-0.106	(0.115)	0.068	(0.103)
Dispute settlement forums (DSF)								
jirga	0.043	(0.090)	0.033	(0.091)	0.043	(0.090)	0.070	(0.079)
dsf	0.168 **	(0.062)	0.158 **	(0.062)	0.168 **	(0.062)	0.145 **	(0.069)
ler	-0.103	(0.113)	-0.082	(0.114)	-0.103	(0.113)	-0.062	(0.097)
Susceptibility to natural disasters								
dis_prone_~l	0.148 ***	(0.040)	0.147 ***	(0.041)	0.148 ***	(0.040)	0.144 **	(0.055)

Notes: 2. The table is prepared by the author. 2. The Table is an extended version of Table 3.3. 3. The standard errors are reported in parenthesis, estimated under the assumption that allow unequal variance of two groups. 4. The narrower definition of a CO village is that the village has currently registered COs; the wider definition of a CO village is those villages listed as having a CO or similar activities in the PHKN village list or those villages that had initial contact with PHKN but villagers failed to form a CO. The number of observation under the narrower definition is A=24, B=81, C=75, while that under the wider definition is A=60, B=45, A'=58, C=41. 5. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Appendix Table 3.2(A)
Correlates of program participation (narrower definition of a CO village)

	Dependent variable: d_co1				
	Model 1	Model 2	Model 3	Model 4	Model 5
Demography					
lit_rate	-0.0030	-0.0030	-0.0030	-0.0030	-0.0030
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
vil_pop/1000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.000	0.000	0.000	0.000	0.000
agri_prof_prc	-0.0040	-0.0040	-0.0040	-0.0040	-0.0040
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Basic amenities, infrastructure, and shops					
irrigated_village	-0.0060	-0.0080	-0.0200	-0.0690	-0.0770
	(0.109)	(0.111)	(0.115)	(0.108)	(0.113)
rd_length	-0.0050	-0.0050	-0.0040	-0.0030	-0.0030
	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)
cln_drnk_wat	-0.0010	-0.0010	-0.0010	-0.0020	-0.0020
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
gas	-0.0800	-0.0830	-0.1100	-0.0590	-0.0830
	(0.113)	(0.115)	(0.119)	(0.132)	(0.140)
i_net	-0.251*	-0.249*	-0.241*	-0.274*	-0.266*
	(0.101)	(0.103)	(0.104)	(0.124)	(0.129)
kar_shop	-0.1430	-0.1420	-0.1390	-0.1790	-0.1750
	(0.131)	(0.129)	(0.131)	(0.116)	(0.118)
Access to education and medical facilities					
prim_school	0.0890	0.0970	0.0880	0.0770	0.0770
	(0.121)	(0.123)	(0.120)	(0.117)	(0.117)
mid_sch	-0.0440	-0.0450	-0.0450	-0.0860	-0.0860
	(0.101)	(0.102)	(0.101)	(0.097)	(0.098)
hi_scho	0.2200	0.2030	0.2150	0.1080	0.1070
	(0.169)	(0.170)	(0.169)	(0.163)	(0.164)
d_madra	-0.0320	-0.0290	-0.0560	-0.0250	-0.0420
	(0.107)	(0.108)	(0.105)	(0.099)	(0.100)
bhu	0.1310	0.1020	0.1160	0.1240	0.1110
	(0.168)	(0.171)	(0.172)	(0.155)	(0.163)
Susceptibility to natural disasters					
dis_prone_vil	0.1360	0.1490	0.1080	0.1840	0.1630
	(0.119)	(0.120)	(0.124)	(0.121)	(0.125)
Potentially endogenous variables					
dsf		0.1160			0.0100
		(0.083)			(0.089)
cbsch			0.1390		0.1030
			(0.141)		(0.126)
tba				0.344***	0.334***
				(0.089)	(0.088)
Intercept	0.788**	0.651*	0.823**	0.597*	0.616*
	(0.255)	(0.275)	(0.259)	(0.256)	(0.269)
R-squared	0.262	0.271	0.273	0.362	0.368
F-statistics	2.537	2.151	2.379	2.968	2.576
Level of Significance	0.003	0.010	0.004	0.000	0.001
No. of Obs.	105	105	105	105	105

Notes: 1.See Table 3.3. The narrower definition of a CO village is that the village has currently registered COs; the wider definition of a CO village is those villages listed as having a CO or similar activities in the PHKN village list or those villages that had initial contact with PHKN but villagers failed to form a CO. 2. The table is prepared by the author and is an extended version of Table 3.4.

Appendix Table 3.2(B)
Correlates of program participation (wider definition of a CO village)

	Dependent variable: d_co1				
	Model 1	Model 2	Model 3	Model 4	Model 5
Demography					
lit_rate	0.0000	0.0010	0.0010	0.0000	0.0010
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
vil_pop/1000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.000	0.000	0.000	0.000	0.000
agri_prof_prc	0.0010	0.0010	0.0000	0.0010	0.0000
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)
Basic amenities, infrastructure, and shops					
irrigated_village	-0.0840	-0.0860	-0.1030	-0.1210	-0.1320
	(0.122)	(0.120)	(0.119)	(0.124)	(0.119)
rd_length	-0.0080	-0.0080	-0.0070	-0.0070	-0.0070
	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)
cln_drnk_wat	-0.003*	-0.004*	-0.004*	-0.004**	-0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
gas	-0.2960	-0.3010	-0.3360	-0.2840	-0.3250
	(0.185)	(0.174)	(0.186)	(0.176)	(0.174)
i_net	-0.0990	-0.0960	-0.0860	-0.1130	-0.0970
	(0.156)	(0.152)	(0.152)	(0.155)	(0.154)
kar_shop	-0.2460	-0.2450	-0.2400	-0.268*	-0.258*
	(0.127)	(0.129)	(0.126)	(0.120)	(0.123)
Access to education and medical facilities					
prim_school	0.0590	0.0710	0.0570	0.0510	0.0590
	(0.162)	(0.165)	(0.163)	(0.164)	(0.167)
mid_sch	-0.1110	-0.1120	-0.1130	-0.1360	-0.1330
	(0.111)	(0.109)	(0.111)	(0.106)	(0.105)
hi_scho	0.0480	0.0240	0.0420	-0.0180	-0.0270
	(0.144)	(0.148)	(0.142)	(0.149)	(0.148)
d_madra	0.0860	0.0910	0.0540	0.0900	0.0650
	(0.110)	(0.111)	(0.111)	(0.111)	(0.114)
bhu	0.1210	0.0800	0.1020	0.1170	0.0730
	(0.160)	(0.163)	(0.156)	(0.157)	(0.154)
Susceptibility to natural disasters					
dis_prone_vil	0.3030	0.3220	0.2660	0.332*	0.3060
	(0.170)	(0.183)	(0.175)	(0.161)	(0.177)
Potentially endogenous variables					
dsf		0.1660			0.1120
		(0.146)			(0.155)
cbsch			0.1860		0.1670
			(0.136)		(0.134)
tba				0.2050	0.1650
				(0.110)	(0.117)
Intercept	0.841**	0.6460	0.889**	0.727*	0.6600
	(0.271)	(0.338)	(0.280)	(0.284)	(0.351)
R-squared	0.265	0.278	0.279	0.290	0.307
F-statistics	5.031	5.233	6.320	6.426	8.017
Level of Significance	0.000	0.000	0.000	0.000	0.000
No. of Obs.	105	105	105	105	105

Notes: See Table 3.3. The narrower definition of a CO village is that the village has currently registered COs; the wider definition of a CO village is those villages listed as having a CO or similar activities in the PHKN village list or those villages that had initial contact with PHKN but villagers failed to form a CO. The table is prepared by the author and is an extended version of Table 3.4

Chapter 4: How Do Community-based Development Interventions Work? An Analysis at the Community Organization Level

4.1 Introduction

The CBD/CDD approach is an important part of development practices. It is becoming a popular feature of World Bank support in multi-stakeholder engagements, especially in a decentralized context (Labonne and Chase, 2009: Mansuri and Rao, 2004). According to Labonne and Chase (2009), there are a number reasons to believe that better participation by the local community in the development process improves outreach and enhances outcomes: i. communities are well-aware of their most dire needs, ii. the communities can suggest the best possible solutions for their needs, given the chance to participate in the decision-making process, iii. the use of local intelligence can also improve targeting performance and project design, and iv. the involvement of members of the local communities in the decision-making process regarding the design and implementation of public infrastructure projects creates a sense of ownership among them, which results in well-constructed and maintained public goods. According to Sen (1999), participation in itself encourages the local citizenry to voice its opinions in the development process. The most influential studies to focus on the CBD/CDD approach are those of Bardhan (2000, 2002), Chase (2002), Paxson and Schady (2002), Platteau and Gaspart (2003, 2004), Mansuri and Rao (2004), Rao and Ibanez (2005), Bardhan and Mookherjee (2005), Humphreys et al. (2006), Araujo et al. (2008), Bjorkman and Svensson (2009), Khwaja (2009), Labonne and Chase (2009, 2010), and Arcand and Fafchamps (2011). Among these, those that focus on preference-matching are really few in number; I will briefly discuss some of those, in this section.

Rao and Ibanez (2005) investigate the preference-matching process (in what they call "preference-targeting") of the Jamaica Social Investment Fund (JSIF); they use retrospective data collected from a sample of JSIF member communities. That study attempts to match the major needs of the communities with JSIF interventions. Rao and Ibanez report a mismatch between community needs and project interventions, that is, only two of five community needs, in each case, were addressed by the interventions. Moreover, the results show that those community members with better education and strong networking dominate decision-making, and hence match their preferences more successfully with the project interventions than others. Interestingly, such elite domination does not constitute pure elite capture *per se*, but rather an *altruistic elite capture*: around 80 percent of the respondents were satisfied with project outcomes. Since the study uses retrospective data, its findings may suffer from recall bias.

Motivation of Labonne and Chase (2009) closely resembles to that of this chapter. The study addresses the mechanism through which household-level preferences are aggregated to generate community-level proposals, by using data from a CDD project implemented in the Philippines. Furthermore, the study investigates how proposals are chosen by the communities and how resources are allocated across the villages. Results of this study support the assertion that resources flow to the poorest and most politically active villages. Furthermore, the study finds that both the community and its leader are able to represent equally their preferences in community proposals; it also finds that elected leaders who belong to heterogeneous villages tend to override their community's preferences. However, the authors admit to the shortcomings inherent in their study when they say that "given decision-making procedures in CDD projects, narrow measures of community preferences fail to capture households' interest in several types of support. Furthermore, it is hard to model in a simple way how household preferences are aggregated" (Labonne and Chase, 2009, p.228).

Humphreys et al. (2006) investigate the potential influence of facilitators in shaping the overall opinions of a community. The study involves a countrywide social experiment that comprises deliberative public meetings implemented in the island state of Sao Tome and Principe, which has a total population of approximately 160,000. The debates focus on the potential use of expected oil revenues. To help make the debates run smoothly, each of the groups was assigned a discussion leader—a facilitator for the purpose of moderation, and recording detailed outcomes. Bearing in mind the random nature of the assignment, the authors were able to gauge the influence of facilitators on the outcomes during group discussions, and they found the facilitators to have considerable influence on outcomes. Indeed, they found that "the preferences recorded in the deliberative meetings to a large degree reflect the preferences of discussion leaders, not participants" (Humphreys et al., 2006, p.24). Being a social experiment, the internal validity of the study is not an issue, but its external validity is.

Normally, the local elite dominate the process that relates to the preparation of local development plans (Labonne and Chase, 2009). This domination is somehow similar to conditional cooperation that involves cooperative movements (Ostrom, 2000). However, as they tend to be pioneers in the process, the local elite also provide inspiration for others in joining the process. According to the existing literature, the elite distort the expected outcomes of the participatory decision-making process by representing their own preferences in the process and ignoring those of the local community (Labonne and Chase, 2009), by acting either benevolently (Ibanez and Rao, 2005), as prime movers (White, 2002) or as rent-seekers (Mansuri and Rao, 2004). Whatever the form of self-interest manifestation, it is an established

fact that the local elite "derail" CBD/CDD projects from their original objectives. As described by Labonne and Chase (2009), elite domination in decision-making at the community level is an established fact; such circumstances may lead to a scenario that Sidel (2004) says relates to the so-called theory of local bossism. The theory is based on a general feeling among the masses that close ties with the local elite are crucial to fulfilling individual and collective needs. Bearing in mind the aforementioned discussion, it becomes a valid question whether the CBD/CDD approach, through decades of engagement with local communities, can challenge this domination. Along with others, this chapter will also attempt to this answer this question.

None of the aforementioned studies employs household-level preference-matching analysis. Although Labonne and Chase (2009) claim to use household-level preference data, their unit of analysis is the village. Furthermore, in Labonne and Chase (2009), preference-matching analysis is based on data of preferences as expressed by village leaders and households during the time of project formation. This timing may imply that the preferences data were contaminated by strategic motivations to affect project formation. In contrast, this chapter undertakes household and/or commune (i.e., subvillage)-level preference-matching analysis, through the use of data that relate to preferences, but with no prior knowledge of the type or scale of interventions to be implemented; it also uses *ex post* data pertaining to already-implemented interventions. Labonne and Chase (2009) focuse on two stages of the CBD process—namely, proposal selection and funding—but it ignores an important stage: the execution or implementation of the approved proposals. This may provide an incomplete picture of preference-matching analysis.

According to Arcand and Fafchamps (2011), there has been a rapid growth in the literature (as evidenced by the studies of Besley and Coate [2003], Besley et al. [2004], and Bardhan and Mookherjee [2005, 2006a, 2006b]) of studies that investigate the factors that affect decision-making at the local level. However, this literature tends to focus on Asia, and especially on formal local institutions there. To the best of my knowledge, this chapter is the first to analyze informal local institutions. This chapter mainly analyzes the dynamics of the intra-group (i.e., within-CO) decision-making process with regard to preference-matching, at both the household and CO (commune/village) level. Moreover, the study area comprises a male-dominated society, which is evidenced by its overall low labor market participation by women. According to Agarwall (2001),[52] the region is known for its male domination, and women there are systematically excluded from participatory development, owing to their weak bargaining power. The NGO that I study is women-driven and women-focused; given the

[52] Agarwall (2001) focuses on South Asian countries, of which Pakistan is one. The study shows the systematic exclusion of women from participatory development process, owing to their weak bargaining power.

socioeconomic context of the area, this study is unique by virtue of its focus.

In terms of the literature, then, both the study area and the NGO examined here are unique. The NGO studied here is exceptional in the local context, as most Pakistani NGOs are male-driven and work primarily on a male-focused agenda. In the development economics literature, neither the CBO approach nor women-driven CBOs are novel; however, a study of women-driven CBOs in a male-dominated society is not only novel but it can also derive implications that may diminish the influence of the local elite and the well-networked with regard to the decision-making process.

To fill the aforementioned gaps in the literature, this chapter first attempts to test whether the CO proposals reflect the members' preferences. In this analysis, I investigate whether CO leaders are better able to reflect their preferences in CO proposals. This chapter then attempts to test whether PHKN interventions match CO proposals. . In both level of analyses, I estimate the correlates of preference matching, such as the influence of facilitators and CO leaders.

The rest of Chapter 4 is organized as follows. Section 4.2 describes the data used in the analysis, and Section 4.3 presents the empirical strategy that is adopted. Section 4.4 addresses matching between the preferences of CO members and CO proposals, and provides correlates of the matching between the two while Section 4.5 covers matching between CO proposals and PHKN interventions, and provides the correlates of preference-matching. Section 4.6 concludes the chapter.

4.2 Data

4.2.1 Data utilized

I use the following four datasets in my analysis.

i. CO benchmark survey (Survey #2 of Table 2.4, Chapter 2)

ii. Household benchmark survey (Survey #3 of Table 2.4, Chapter 2)

I use this dataset to derive data on the initial preferences of the member households. More specifically, I employ the member households' preferences/motives in joining a CO. The preferences are recorded in the dataset in the form of answers to close-ended questions. Among the others, these questions also contain options regarding the major interventions of the PHKN (e.g., HRD training, MF, MIPs). I use the information

gathered in response to this question to generate dummies that represent the member households' preferences vis-à-vis a specific intervention.[53] The dataset provides more accurate data pertaining to the member households' preferences, compared to that used by Labonne and Chase (2009): the households in the case of the current study are completely unaware of the type or scale of interventions to be implemented in their respective commune or village, and hence, I can safely claim that the member household preferences are not contaminated.

iii. Household resurvey (Survey #5 of Table 2.4, Chapter 2)

From this dataset, I use only data from member households. The survey was implemented one year after the benchmark survey, when each of the member households was asked if it had benefitted, either directly or indirectly, from any of the PHKN's major interventions during the period under review. Furthermore, the information given by the households is cross-checked by PHKN staff members, who hold official records. I then use information to generate dummies that represent the implementation of the interventions. I use the dummies in preference-matching analysis.

iv. COs' meeting records (Survey #6 of Table 2.4, Chapter 2)

The dataset comprises the meeting-level records of commune/village development proposals/plans prepared by a CO (henceforth referred to as CO proposals) and submitted to the PHKN for funding between October 2010 and November 2011. I extract from this dataset information used to generate dummy variables; these variables represent the CO proposals.

4.2.2 CO characteristics

Table 4.1 summarizes the CO characteristics fixed at the time of CO formation and those of the PHKN activities following CO formation, for all COs. The average CO size is 23 persons (range, 16–40). Among all COs, only 26 percent are men-driven; the rest are women-driven COs, thus reflecting PHKN's gender-based orientation. CO formation requires, on average, 50 days—the period between the CO formation and the initial contact between PHKN staff and the villagers; this period is represented in Table 4.1 by the variable *incub_per*. The incubation period ranges from one day to 398 days (about 13 months); the average CO age is 45 months.[54] Detailed

[53] MF has been dropped, owing to there being a low (or no) response to questions pertaining to it.
[54] This is shown by the variable *co_age*. According to the data that relates to this variable, some of the COs are very old, dating back to the days before the formal establishment of PHKN.

information regarding CO leadership—that is, president, secretary, and activists—is also available in the dataset. The average age and education of the president are 39 and five years, respectively; those of the secretary are 34 and seven years, and those of the activists are 36 and six years, respectively. Owing to their high correlation, the age (education) values for the president and the secretary are combined, and their respective mean values are used in the CO-level regression analysis.[55] Under the category of PHKN activities, the variable *saving* represents the CO's savings and efficiency, which I employ for further analysis in this chapter. The average savings are PKR 7,800, while the average per-capita savings are PKR 350.[56] The other variables representing PHKN's major interventions are important, because they involving a large proportion of PHKN financial resources and each CO's collective action. All COs have received some kind of HRD training; additionally, around 36 percent of the COs have received an MIP, and 27 percent of the same have availed themselves of an MF loan.

In Appendix Table 4.1, a comparison between male and female COs is given. Based on the variables shown in Table 4.1, the appendix table shows that male COs are larger (at least by two members and the difference is statistically significant at the 5-percent significance level) and younger than female COs. The leadership of male COs tends to be more experienced and educated than that of female COs. The education and skills-based gap between male and female CO leadership speaks to the prevailing gender-based discrimination in the study area. It will be interesting to see whether the prevailing disparity among male and female COs can influence preference matching ability of male COs towards their advantage.

I observe no difference between the savings levels of male COs and those of their female counterparts. Thus far, none of the male COs has received MF, and the results show that HRD training and MIPs are mostly directed towards female COs.[57] All in all, a comparison of male and female COs underscores the PHKN's orientation towards women. This raises an intriguing question whether female COs are more likely to match their proposals with PHKN interventions than male COs?

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[55] The ages of the president and secretary highly correlate (i.e., correlation coefficient is 0.486, which is statistically significant at the 1-percent level), as do the educations of the president and secretary (correlation coefficient is 0.458, which is significant at the 1-percent level). On the other hand, the age and education of the activists do not correlate with those of the presidents or secretaries.

[56] "PKR" is the ISO currency code for the Pakistani rupee. At the time of the benchmark survey, USD 1.00 = PKR 86.

[57] The absolute number of conventional training sessions is the same for male and female COs (not reported here). Female COs mostly received HRD training on poultry farms, in raising nursery plants, in educating and mobilizing TBAs, in fostering agro-based cottage industries, and with respect to income-earning skills. HRD training on family planning are also organized for female COs.

4.2.3 Summary statistics of key variables from CO meeting data

Table 4.2 summarizes 243 CO meeting records (held between October 2010 and November 2011). Meetings are held to draft CO proposals while involving the local community and its stakeholders; they are used to convey the drafted plans to the PHKN as formal CO proposals. The figures pertaining to CO size and savings are consistent with those in Table 4.1. A CO meets once per month to formulate proposals, and the attendance rate of CO members in the meetings is 75 percent, which is quite high. In the second half of this chapter, I use the number of meetings, the attendance ratio, and the CO's per-capita savings as a CO's performance measures (outcomes). I observe an interesting variation in the various types of CO proposals: one-half of the proposals pertain to HRD training, and 30 percent of the proposals pertain to MIPs.

4.3 Empirical Strategy

In this chapter, I adopt the following empirical analysis strategy for preference-matching. As elaborated in CBD process of PHKN (subsection 2.2.2 of Chapter 2), the savings and the implementation of MIP or MF are dynamically evolved through the CO-meetings—where CO members' preferences are aggregated into CO proposals and then PHKN interventions[58]—I analyze preference-matching as the key issue. In the next paragraph, I define how I define the match. Using the match dummy thus compiled, I conduct preference-matching in both bivariate and multivariate ways.

I define match (verses mismatch) as shown in Tables 4.4 and 4.8. I explain the logic using Table 4.4. If a member household's preference for intervention X is reflected in a plan Y proposed by a CO, I assign the value of unity to the match dummy variable. If the CO proposal does not reflect the members' preference, I assign the value of zero to the match dummy variable. Similarly, Table 4.8 details a situation depicting a match or mismatch between the CO proposal and the PHKN response. In both levels, I employ two different definitions of match, i.e. "broad match" and "strict match." This is because CO proposals and PHKN interventions sometimes cover more than one component out of the list of MF, HRD training, and MIP. If the components of X and that of Y are exactly the same, the strict match dummy takes the value of unity. On the other hand, if one (or more) of the components of X is included in Y, the broad match dummy takes the value of unity. In Tables 4.4 and 4.8, the broad match is shown in green cells and the strict match is shown by the red underline. I use the broad match for major analysis

[58] For further details, see subsection 3.2.1 of Khan et al. (2011).

while I use the strict match as a robustness check.

4.4 Matching of CO Members' Preferences and CO Proposals

4.4.1 Distribution of CO members' preferences

Table 4.3 summarizes the key variables of member households that may affect the preference-matching ability of those households and/or their COs.[59] The number of observations is 234 member households—a subsample of the total 249 member households that excludes those households with an incomplete match with the CO data. The table appends four categories of variables, namely, demographic attributes, leadership, social status and networking, and preference-matching. The subsample is more or less similar to the overall sample and nonmember households in demographic attributes. The households representing CO leadership (i.e. the president, secretary, and activists) comprise 8 percent of the subsample. One-tenth of the subsample has nonblood relationships with the local elite, while 28 percent of the same have a blood relationship.[60] Moreover, 90 percent of the members enjoy high social status. The proportion of the subsample to have shown a preference for HRD training and for MIP are 53 percent and 34 percent, respectively; however, the households to have benefitted from PHKN interventions that relate to HRD training and MIPs are 40 percent and 15 percent, respectively.

Hence, the summary statistics depict an apparent gap between member preferences and PHKN responses. Such a gap is natural, as it is not possible for any NGO to respond to all member/community demands. The question is whether this gap is evenly distributed across all members (i.e., both general members and leaders), or if it varies according to their social status or networking. Is there any tilt towards a specific group, based on their demographic attributes, social status, or networking ability? If this tilt exists, does it favor a particular group within the membership and hence represent its preferences (needs/desires) in the respective CO proposals and in village/commune development plans? Moreover, is there any disparity among the CO's general members and its leadership, when it comes to their respective preferences being represented in the CO's proposals or PHKN interventions? On the other hand, I would also like to explore any imbalance or disparity on the part of the PHKN in responding to the said preferences in the course of implementing interventions. In this section, I will attempt to answer some of these questions.

[59] Benchmark household data (Survey #3) are used for variables that relate to household preferences and CO leadership. For PHKN interventions, household resurvey data (Survey #6) have been utilized.
[60] Here "local elite" refers to the village/commune head (*malik*), a local notable or the head of *a jirga* (a traditional dispute settlement forum), a local political leader, or a locally elected representative.

4.4.2 Match between CO members' preferences and CO proposals

In this subsection, I discuss the likelihood of the member households to reflect their preferences in the CO proposals (village/commune development plans). I show in Table 4.4 the match between the members' preferences and the relevant CO proposals.[61] The table defines match and mismatch between the preferences and the proposals and indicates the likelihood of a member having his or her preferences reflected in the relevant CO proposals. For analysis, I use two definitions of the matching, i.e. "broad match" which refers to the situation when preference for one or more interventions is matched with its CO proposal or that of another intervention while "strict match" refers to the case when there is a direct match between the preference for an intervention and its proposal. In Table 4.4, I show broad match by green colored cells while strict match by green colored cells with underlined red-color figures. I employ the broad match for major analysis while the strict match as a robustness check in this chapter.

I append an overall match between the preferences and the proposals, in Table 4.4. Table 4.4 shows an overall match of 70 percent between the member households' preferences and CO proposals (the same can be confirmed from Table 4.6); however, due to nonexistence of comparative studies on preference matching, I cannot interpret this level of matching as good or bad.[62] However, I can analyze whom among the general members or CO leaders are more likely to match their preferences with the concerned CO proposals.

To do this, in Table 4.5, I report a bivariate comparison of the match and the members' status (general members versus leaders by using). Sixty-nine percent of the general members, compared to around 79 percent of the leaders, were able to have their preferences reflected in the relevant CO proposals. However, the difference between general members and the leaders is statistically insignificant. Similar results were found by repeating the exercise with strict definition of preference matching (Appendix Table 4.2).[63] Hence, I can safely claim that leadership cannot influence within-CO decisions with regard to HRD training.

4.4.3 Correlates of matching between the members' preferences and CO proposals

[61] I also show the match between HRD trainings, and MIPs preferences and the relevant CO proposals in reported in Appendix Table 4.2 A–B, separately)

[62] Owing to novelty of the preference matching analysis at household level (and/or even CO level) carried out in this chapter, I am not able to infer that which level of preference matching it is good or vice versa.

[63] I find similar results for a match between member household's HRD trainings and MIP preferences and the concerned interventions (shown in Appendix Tables 4.3 A-B), separately.

One may think that the level of preference-matching is affected by the influence of external factors or agents. Potential factors are the presence of facilitator(s) in CO meetings, or optimal resource allocation by PHKN. I extract from CO meeting records information on PHKN facilitation during the preparation of commune/village plans. PHKN facilitators randomly participate in CO meetings held to draft commune/village plans. Bearing this in mind, it is possible that the facilitators might have some influence over the plan-development process. Moreover, the existing literature is silent with regard to the "optimal resource allocation" argument; however, the literature does support the influence of facilitators in the CBD approach. In this regard, one of the existing hypotheses is whether community proposals are influenced by facilitator preferences. In fact, recent research shows that facilitators can play a strong role in reshaping the outcomes of public meetings (Humphreys et al., 2006).

To assess this possibility as well as other variables that may influence the match, I regress the dummy variable representing the broad match of the preferences and proposals (*match_broad*) on a number of dummy variables representing; CO leadership (*leadership*), presence of PHKN facilitator in a CO meeting (*faci_remarks*), and dummies for native status (native), social status (*sol_status*) and relationship with village head (rel_vil_head) of a CO member. I report regression estimates in Table 4.6 (and in Appendix Table 4.6, for strict match dummy (*match_strict*) as a robustness check). The results suggest that none of the mentioned factors influence the process involving development of CO plans. The null hypothesis of zero slopes is not rejected, either.

Therefore, I conclude that leadership and networking variables of CO members do not affect the level of the match between household preferences and CO proposals. This implies that the preference-matching process does not favor the CO leadership; this seems to indicate that elite capture is nonexistent with regard to preference-matching. Lastly, I find no evidence, which shows influence of external factors on CO plans preparation.

4.5 Matching of CO Proposals and PHKN Interventions

4.5.1 Data on CO proposals and PHKN interventions

I briefly describe the data of the 48 COs, which will be used in the next subsections. I append the summary statistics of the data in Table 4.7 (under categories 1, 2, 3, 4, 5 and 6). The variables under category 4 of Table 4.7 have a pattern almost similar to that reported in Table

4.2 (i.e., summary statistics for individual CO meetings): 85 and 71 percent of the COs have developed and submitted at least one proposal/plan for HRD training and MIPs, respectively, during the period under review. Similarly, 2 percent of the COs have developed and submitted proposals related to MF. In 52 percent of the COs, the facilitator (i.e., the PHKN representative) was present at one meeting, at most (reported under category 6).

As far as PHKN interventions are concerned (under category 6 of Table 4.7), 60 percent and 27 percent of COs have at least one member who has received HRD and MIP interventions, respectively. Additionally, in 15 percent of the COs at least one member has received MF.

Before proceeding with the analysis of matching, I would like to discuss the representativeness of the 48 COs, as PHKN has 90 registered COs at the time of benchmark survey. To address this concern, I compare the sample with the rest of 42 COs in Appendix Table 4.4 (for this comparison, I employ the CO characteristics similar to those used in Table 4.1 for description the population). Based on the comparison, I find no systematic difference between the sample and the rest of COs. Hence, the sample is representative of the population of COs.

4.5.2 Match between CO proposals and PHKN interventions

In Table 4.8, I show the broad match by green colored cells while the strict match by green colored cells with underlined red-color figures. Similar to subsection 4.4.2, the broad match is used for major analysis while the strict match as a robustness check only. I find an overall match of 52 percent between the CO proposals and PHKN interventions.

As the most meaningful bivariate comparison, I examine whether there is difference in the match level between female and male COs. Among the 48 COs, 13 (27%) are male COs and 35 (73%) are female COs. I found no systematic difference between male and female COs of the sample in terms of savings and participation rate (Appendix Table 4.8). This suggests despite human skilled-based disparities and social constraints, female-COs are as good as the male-COs. I report in Table 4.9 results of match between CO proposals and PHKN interventions distinguishing female and male COs (by using broad definition of preference matching). According to the result, female COs are more likely to match their proposals with the PHKN interventions (70 and 39 percent matching for female and male COs, respectively). The difference between preference matching ability of the two types of COs is significant at 10 percent, which gets slightly weaker but remains significant when strict definition of match is employed (Appendix Table 4.5).

4.5.3 Correlates of matching between CO proposals and PHKN interventions

I attempt in this subsection to identify correlates of preference-matching between CO proposals and PHKN interventions. I employ as the dependent variable the preference-matching dummy of PHKN interventions (*match_broad2*). I use four categories of explanatory variables that represent a CO's initial characteristics (CO size, incubation period in days, male CO dummy, CO age in months), leadership attributes (average age of CO leadership), social status and networking with the local elite (dummy representing relationship [either blood or nonblood] of CO members with the local elite), and PHKN influence (dummy for presence of a PHKN representative as a facilitator in a CO meeting). I use a reduced-form regression model for these analyses. I regress the preference-matching dummy on the four categories of explanatory variables (*mem_no, incub_per*, *co_age*, *co_type, age_leader*, *edu_pc*, *faci_remarks*, and *rel_vil_head*).

I present in Table 4.10 the correlates of the preference-matching, where, Model 1 comprises only the first two categories, namely, initial characteristics and the leadership attributes of the CO (fixed at the time of CO formation); meanwhile, Model 2 is an extended form of Model 1 and includes the third and fourth categories, either of which might be affected by treatment and/or a PHKN selection effect. The signs of most coefficients representing the mentioned variables are as expected. According to the regression estimates, none of the explanatory variables is statistically significant, including those that represent the CO type (co_type), the felicitator's presence in a CO meeting (proxy for PHKN influence) and the relationship with the local elite (proxy for elite capture).

Regarding the difference between male and female COs, the match percentage is 33 to 36 percentage lower among male COs (see the coefficient on *co_type*). However, the coefficient is no longer statistically significant. Therefore, I cannot conclude that female COs perform better than male COs in terms of matching but I can conclude that female COs perform not worse than male COs.

I repeat the analysis by using strict preference-matching dummy (*match_strict2*) as dependent variable. I report regression estimates in Appendix Table 4.7 that robustly support the one shown in Table 4.10. In all cases, the null hypothesis of zero slopes is not rejected, either.

4.6 Conclusion

This chapter investigated whether, and how, PHKN interventions are matched with the preferences of CO members. The results show that the match percentage between members' preferences and CO proposals was 70 percent and that between CO proposals and PHKN interventions was 52 percent. Multivariate regression results show that no household characteristics (such as leadership) affect the match between members' preferences and CO proposals. Multivariate regression results show that no CO characteristics (such as the CO size) affect the match between CO proposals and PHKN interventions. Searching for correlates that are significantly associated with the match is left for future research. However, the brighter side of the insignificant results is that the nonexistence of elite capture and no disparity between male and female COs (from preference-matching viewpoint) is confirmed.

Under the current system, the PHKN collects information regarding household-level (and/or CO-level) preferences, through public meetings. This may prevent some members from expressing their views or voicing their preferences in the presence of others. One of the policy recommendations is the implementation of private preference surveys (at the household or member level), prior to the intervention(s). Furthermore, under the current system, most of the information regarding preferences is collected at pre-CO formation stages; it is recommended that information be updated more frequently. These suggestions might prove helpful in improving preference-matching overall.

The role of the facilitator in formulating CO plans is not clear. Based on quantitative analysis, neither the facilitator, nor social status, nor networking of the CO members influences the preference-matching process; this is a good sign. However, the failure of the quantitative measures to assess the influence of the facilitator and social status of members in the preference-matching process needs to be explored further. For instance, the current quantitative measures may not be strong enough to capture the exact level of influence, and may therefore need to be complemented by some qualitative measures. Another possibility is inclusion of other potential factors like the level of trust among the CO members that may affect the preference-matching process and hence their satisfaction regarding PHKN's activities. Other research issues that were not addressed in this chapter is the source of variation of household preferences and the actual procedure in which the preferences was aggregated into concrete proposals by each CO. Inclusion of these additional dimensions requires information not available in the current dataset. The additional information needs to be collected through social experiments, laboratory games, and satisfaction survey of CO members, which are left for future research.

Table: 4.1
Summary statistics of CO-level variables

Description	Variable	Mean	Std. Dev.	Min	Max
CO characteristics fixed at the time of formation					
Number of CO members	mem_no	23.44	5.08	16	40
Dummy for a male CO	co_type	0.256	dummy	0	1
Incubation period in days (time from the first PHKN contact to the CO formation)	incub_per	50.14	54.08	1	398
Age of the CO in months (time from the CO formation to the survey date)	co_age	44.93	39.45	0	163
President's age (years)	age_presi	39.34	10.34	22	75
President's education (years)	edu_presi	5.31	5.21	0	14
Secretary's age (years)	age_sec	34.16	10.26	20	63
Secretary's education (years)	edu_sec	7.53	5.10	0	14
Activist's age (years)	acti_age	36.10	12.80	18	70
Activist's education (years)	acti_edu	6.08	5.40	0	16
PHKN activities after the CO formation					
Total of savings by CO members (Rs.)	saving	7869.33	4262.23	500	20000
Average savings per member (Rs.)	saving_pc	357.77	221.78	20	1111
Dummy for micro-infrastructure project	mip	0.356	dummy	0	1
Number of MIPs completed	comp_mip	0.400	0.632	0	3
Leadership and managerial skill development trainings	lmst	0.244	dummy	0	1
Non-conventional human resource development trainings	nct	0.544	dummy	0	1
Natural disaster management trainings	ndm_nct	0.233	dummy	0	1
Dummy for microfinance lending activity	mf	0.267	dummy	0	1

Notes:
The Table has been prepared by the author.
The number of observations is 90.

Table: 4.2
Summary statistics of key variables from CO meeting data

Explanation	Variable	Mean	Std. Dev.	Min	Max
1. Meetings between Oct. 2010 and Nov.2011					
*CO Size (no. of members reported in each meeting record)	**tot_mem**	22.23	7.05	10	40
No. of meetings	**tot_meeting**	12.11	1.93	7	16
Average no. of members present in the subset of these meetings	**present_mem**	16.55	5.68	6	34
Participation rate of members in the subset of meetings	**parti_rate**	0.75	0.12	0.4	1.08
2. Members' Attributes					
Present members who can sign in Urdu	**memno_sign~u**	3.31	2.67	0	14
Present members who can sign in English	**memno_engs~n**	5.77	4.36	0	25
Educated members present in the meeting (sum of the members who can either sign in Urdu or English)	**educated**	9.05	6.14	1	30
Educated members as a proportion of the total present members	**edu_pc**	0.54	0.26	0.08	1
Present members who cannot sign [use thumb impression for their attendance]	**memno_thumb**	7.28	5.04	0	22
3. CO Savings (in Pak. Rs.)					
Previous - balance in previous meeting	**pre_sav**	6685.43	5115.99	0	22400
New - deposit in the current meeting	**sav_meeting**	131.42	241.07	0	3500
Current - balance after the current meeting	**tot_savings**	6953.10	5340.91	0	29699
Savings per capita - based on tot_savings	****saving_pc11**	325.82	256.67	0	1275

No. of Observations: 243 (Commune/Village Development Plans for functional COs only)

Notes:

1. The Table has been prepared by the author.

2. All the above-mentioned figures are extracted from Commune/Village Development Plans from meeting proceedings of all registered COs held between October 2010 and November 2011 (Survey # 6).

*This variable has no variation across meetings for the most of COs., In such case, *tot_mem* is identical to *mem_no* in Table 4.1. In a few COs, the membership size changed duirng study period, in such a case, tot_mem has some variation across meetings.

**saving_pc11 is based on data collected through Survey # 6 and is different from saving_pc (shown Table 4.1) based on Survey # 2 data

The Table has been prepared by the author.

Table: 4.2
Summary Statistics (CO Meetings)

Explanation	Variable	Mean	Std. Dev.	Min	Max
4. Types of Proposal/Plans approved by the CO					
HRD Trainings	**map_hr**	0.50	Dummy	0	1
Micro-infrastructure project (MIP)	**map_mip**	0.30	Dummy	0	1
Anti-WBAs Program	**awbap**	0.03	Dummy	0	1
MF	**map_mf**	0.01	Dummy	0	1
At least once education related proposal/plan approved by a CO	**map_edu**	0.03	Dummy	0	1
Awareness raising activities	**map_aware**	0.04	Dummy	0	1
At least once other proposal/plan approved by a CO	**map_other**	0.21	Dummy	0	1
Health related proposal/plan	**health**	0.12	Dummy	0	1
Livestock related proposal/plan	**livestock**	0.18	Dummy	0	1
Facilitator (PHKN's Staff) participated in a CO meeting	**faci_remarks**	0.17	Dummy	0	1

No. of Observations: 243 (Commune/Village Development Plans for functional COs only)

Note:

1. All the above-mentioned figures are extracted from Commune/Village Development Plans from meeting proceedings of all registered COs held between October 2010 and November 2011 (Survey # 6).

*This variable has no variation across meetings for the most of COs., In such case, *tot_mem* is identical to *mem_no* in Table 4.1. In a few COs, the membership size changed during study period, in such a case, tot_mem has some variation across meetings.

**saving_pc11 is based on data collected through Survey # 6 and is different from saving_pc (shown Table 4.1) based on Survey # 2 data

Table: 4 .3
Summary Statistics (member households)

Explanation	Variable	Mean	Std. Dev.	Min	Max
1. Demographic attributes of member households					
Household size	**hhsize**	6.40	2.75	1	16
Household head age	**hh_age**	50.92	14.51	21	91
Rate of literacy household head	**hh_lite**	0.76	Dummy	0	1
Years of schooling hh head	**hh_edu**	6.22	4.38	0	16
Female headed households	**fem_hh**	0.08	Dummy	0	1
2. CO leadership					
Leadership (dummy)	**leadership**	0.08	Dummy	0	1
3. Social status and networking					
The household is native? (yes=1, otherwise 0)	**native**	0.98	Dummy	0	1
Whether the household enjoys high social standing; proxy for wealth and influence (yes=1, otherwise 0)	**sol_status**	0.90	Dummy	0	1
Whether the household has a relationship (blood**)** with local head (yes=1, otherwise	**bloodrel_v~d**	0.28	Dummy	0	1
The household has a relationship (non-blood**)** with local head (yes=1, otherwise 0)	**nonblood_v~d**	0.10	Dummy	0	1
4. Preference matching			Dummy		
The household which has shown preference for HRD trainings	**hr_prefere~e**	0.53	Dummy	0	1
The household which has received HRD trainings: Yes=1, otherwise 0	**hr_recipient**	0.40	Dummy	0	1
The household which has shown preference for MIP: Yes=1, otherwise 0	**mip_prefer~e**	0.34	Dummy	0	1
The household which has received MIP; Yes=1, otherwise 0	**mip_recipi~t**	0.15	Dummy	0	1
The WBA affected household; Yes=1,	**wba_affected**	0.21	Dummy	0	1
The AWBAP recipient household; Yes=1, otherwise 0	**awbap_reci~t**	0.20	Dummy	0	1

No. of Observations: 234 (represents households of total 249 member households excluding those with incomplete match with the CO data)

Notes:

1. All variables belonging to category 4 are dummies representing a member's initial preference for any of the PHKN interventions. Benchmark household data (Survey # 3) is used for variables related to household preferences and CO leadership. PHKN's response refers to any of the PHKN intervention(s) from which the household has been benefited during Oct. 2010 and Nov. 2011. For PHKN's response household re-survey data
2. The Table has been prepared by the author.

Table: 4 .4

The Procedure to Assign Match Vs. Mismatch

(the comparison of member household's preference and

Member Households' Preference		MF (Y1)	HRD trainings (Y2)	MIP (Y3)	both HRD and MIP =	Total
Preference for	MF (X1)	0	1	1	5	7
	HRD training	0	34	15	74	123
	MIP (X3)	0	23	16	40	79
Neither of these	(X0)	0	5	2	18	25
Total		0	63	34	137	234

Notes:

1. Match in broad sense is represented by green colored cells

2. Match in strict sense is represented by cells that have red-colored underlined figures (the strict match in used as a robustness check)

3. Cells other than described in 1 and 2 represent mis-match.

Table: 4.5

Match between members' preferences and CO proposals - general members Vs. CO leaders (Broad Match)

		Preference Matching			%age of match	Chi.Sq Test of the equality	
		Match	Mis-	Total (3)		P-Value	
Type of Member	General Membe	149	66	215	69.30	0.775	
	Leader	15	4	19	78.95		
	Total	164	70	234	70.09		

Table 4.6

Correlates of match between members' preferences and co proposals

	Dependent variable:
Variables:	Broad match dummy (match_broad)
leadership	0.091
	(0.111)
faci_remarks	0.089
	(0.063)
native	-0.086
	(0.236)
sol_status	0.011
	(0.104)
rel_vil_head	-0.045
	(0.065)
Intercept	0.739**
	(0.253)
Mean of the dep.var.	0.701
R-squared	0.035
F-statistics	1.65
Level of Sig.	0.148
Number of Obs.	234

Notes: 1. The number of observations is 234, representing member households only. 2. The Table has been prepared by the author. 3. The robust standard errors in brackets. 4. * p <0.1, ** p <0.05, *** p <0.01.

Table 4.7
Summary Statistics (CO Meetings)

Explanation	Variable	Mean	Std. Dev.	Min	Max
1. CO Size	**mem_no**	20.99	7.91	10	40
2. Meetings between Oct. 2010 and Nov.2011					
No. of meetings	**tot_meeting**	12.21	2.16	7	16
Average no. of members present in the subset of these meetings	**present_mem**	16.40	5.58	8	31
Participation rate of members in the subset of meetings	**parti_rate**	0.75	0.06	0.64	0.90
Educated members as a proportion of the total present members	**edu_pc**	0.42	0.21	0.11	0.9
3. CO Savings (in Pak. Rs.)					
Previous - balance in previous meeting	**pre_sav**	7124.12	5036.78	316.67	22108.33
New - deposit in the current meeting	**sav_meeting**	122.64	73.61	36.67	438.33
Current - balance after the current	**tot_savings**	7428.46	5047.05	353.33	22228.33
Savings per capita - based on tot_savings	**saving_pc**	344.34	241.55	23.56	986.56
4. Types of Proposal/Plans approved by the CO					
HRD Trainings	**map_hr**	0.85	Dummy	0	1
Micro-infrastructure project (MIP)	**map_mip**	0.71	Dummy	0	1
MF	**map_mf**	0.02	Dummy	0	1
5. Socio-Economic Factors					
Ratio of members who are native members of a CO	**native**	0.98	0.060	0.75	1
Ratio of members having high social	**sol_status**	0.90	0.258	0	1
Ratio of members having blood relationship with the respective village	**bloodrel_v~d**	0.28	0.341	0	1
Ratio of members who having non-blood relationship with the respective village	**nonblood_v~**	0.10	0.151	0	0.6
6. Aggregate Preferences and Response					
CO in which at least one member has received HR training	**hr_recipient**	0.60	Dummy	0	1
CO in which at least one member has been benefitted from MIP	**mip_recipi~t**	0.27	Dummy	0	1
CO in which at least one member has received MF	**cr_recipient**	0.15	Dummy	0	1
Facilitator (PHKN's Staff) participated in a CO meeting	**faci_remarks**	0.52	Dummy	0	1

No. of Observations; 48

Notes:

1. 48 represents no. of COs excluding non-functional COs and all COs with incomplete match with either CO data or village/commune development proposals/plans.

2. For categories 2 and 3; all the variables are average values over CO meetings held for preparation of village/commune development proposal/plans and proceedings submitted to PHKN during Oct. 2010 and Nov. 2011

3. Incase of category 4, all the variables are maximum values over CO meetings held for preparation of village/commune development proposal/plans and proceedings submitted to PHKN during Oct. 2010 and Nov. 2011

4. In categories 5 and 6, 48 represents number of COs to whom a subset of 234 member households

5. All variables under category 5 are aggregated forms of the variables given in Table 4.6 (household variables aggregated at CO level)

6. In category 6, all the values show maximum aggregation of household level dummies at CO level.

Table: 4 .8

The Procedure to Assign Match Verses Mismatch

(the comparison of CO proposals and PHKN interventions)

		PHKN Interventions						
		No Proposal	MF (Y1)	HRD trainings (Y2)	MIP (Y3)	both MF and HRD = [Y13]	both HRD and MIP = [Y23]	Total
CO Proposals for	MF (X1)	0	0	0	0	0	0	0
	HRD trainings (X2)	4	0	3	1	3	2	13
	MIP (X3)	3	0	1	1	0	2	7
	both MF and HRD = (X13)	1	0	0	0	0	0	1
	both HRD and MIP) = (X23)	9	0	7	0	4	7	27
Total		17	0	11	2	7	11	48

Notes:

1. Match in broad sense is represented by green color cells

2. Match in strict sense is represented by cells that have red-colored underlined figures (the strict match in used as a robustness check)

3. Cells other than described in 1 and 2 represent mis-match.

Table: 4.9

Matching between CO proposals and PHKN interventions - female COs Vs. male COs (Broad Match)

		Matching			%age of match	Chi.Sq Test of the equality	
		Match (1)	Mis-match (2)	Total (3)		P-Value	
CO Type	Female COs	7	3	10	70.00	2.972	*
	Male COs	15	23	38	39.47		
	Total	22	26	48	45.83		

1. The number of observations is 48. 2. The Table has been prepared by the author. 3. * p<0.1, ** p<0.05, *** p<0.01.

Table 4.10

Correlates of matching between co proposals and phkn interventions (by using broad match dummy)

	Dependent variable:	
Variables:	match_broad2	match_broad2
1. CO characteristics fixed at the time of formation		
mem_no	-0.004	-0.002
	(0.015)	(0.016)
incub_per	0.000	0.000
	(0.001)	(0.001)
co_age	0.001	0.001
	(0.002)	(0.002)
co_type	-0.333	-0.358
	(0.265)	(0.261)
edu_pc	-0.223	-0.252
	(0.414)	(0.421)
2. CO leadership attributes		
age_leader$	0.008	0.006
	(0.010)	(0.010)
3. External influence (presence PHKN's facilitator in the meeting)		
faci_remarks		0.105
		(0.174)
4. External influence (Social status of members and network with local elite)		
rel_vil_head		0.035
		(0.299)
Intercept	0.620	0.597
	(0.729)	(0.745)
Mean of the dep.var.	0.518	0.518
R-squared	0.095	0.106
F-statistics	0.846	0.68
Level of Sig.	0.542	0.706
Number of Obs.	48	48

Notes:

1. The number of observations is 48. 2. The Table has been prepared by the author. 3. Estimated by OLS (and/or linear probability models, results available on request), with robust standard errors reported in brackets. 4. * p<0.1, ** p<0.05, *** p<0.01.

$ "age_leader" is the average of the age of president and that of secretary while "edu_leader" is the average of the education years of president and that of secretary.

Appendix Table: 4.1
Comparison of male and female COs

Variable	Mean for each (A) Female COs (n=67)	(B) Male COs (n=23)	Difference (A)-(B) Mean		(S.E.)
CO characteristics fixed at the time of formation					
mem_no	22.91	25.00	-2.09	**	(1.01)
incub_per	50.72	48.48	2.24		(11.66)
co_age	53.49	20.00	33.49	***	(6.88)
age_presi	38.51	41.78	-3.28		(2.26)
edu_presi	3.85	9.57	-5.71	***	(0.99)
age_sec	32.31	39.52	-7.21	**	(3.05)
edu_sec	6.67	10.04	-3.37	***	(1.02)
acti_age	35.36	38.26	-2.90		(3.48)
acti_edu	5.15	8.78	-3.63	***	(1.25)
PHKN activities after the CO formation					
saving	8189.60	6936.39	1253.21		(1126.76)
saving_pc	380.65	291.12	89.53		(54.15)
comp_mips_no	0.493	0.130	0.362	***	(0.110)
lmst	0.224	0.304	-0.080		(0.111)
nct	0.687	0.130	0.556	***	(0.092)
ndm_nct	0.284	0.087	0.197	**	(0.082)
mip	0.418	0.174	0.244	**	(0.101)
mf	0.358	0.000	0.358	***	(0.059)

Notes: 1. The Table has been prepared by the author and was labeled as Table 4.2 in the early version of the dissertation. 2.The standard errors are reported in parenthesis, estimated under the assumption that allow unequal variance of two groups. 3. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Appendix Table: 4.2

Match between members' preferences and CO proposals - general members Vs. CO leaders (Strict Match)

		Preference Matching			%age of match	Chi.Sq Test of the equality	
		Match	Mis-match	Total (3)		P-Value	
Type of Member	General Member	44	171	215	20.47	1.283	
	Leader	6	13	19	31.58		
	Total	50	184	234	21.37		

Appendix Table: 4.3 (A)
Matching between Household-level Preference and CO proposals

HRD Trainings			COs' Proposals			%age met with CO's Proposals =(1)/(3)	Chi.Sq Test of the equality	
Household Preference	Category		Yes (1)	No (2)	Total (3)		P-Value	
Yes	General Member		97	12	109	88.99	0.286	
	Leader		11	3	14	78.57		
	Subtotal		108	15	123	87.80	0.262	
No	Subtotal		92	19	111	82.88		
Total			200	34	234	85.47		

Appendix Table: 4.3 (B)
Matching between Household-level Preference and CO proposals

MIPs			COs' Proposals			%age met with CO's Proposals =(1)/(3)	Chi.Sq Test of the equality	
Household Preference	Category		Yes (1)	No (2)	Total (3)		P-Value	
Yes	General Member		51	23	74	68.92	0.602	
	Leader		4	1	5	80.00		
	Subtotal		55	24	79	69.62	0.751	
No	Subtotal		111	44	155	71.61		
Total			166	68	234	70.94		

Note:
The Tables has been prepared by the author.

Appendix Table: 4.4

Comparison of subsample of COs (involving matching between CO proposals and PHKN interventions) and the rest of COs

Variable	Mean for each group: (A) COs' subsample employed in analysis (n =48)	Mean for each group: (B) The rest of COs (n =42)	Difference (A)-(B): Mean	Difference (A)-(B): (S.E.)
CO characteristics fixed at the time of formation				
mem_no	23.05	23.79	-0.74	(1.06)
incub_per	49.64	50.58	-0.94	(11.28)
co_age	39.88	49.35	-9.47	(8.09)
age_presi	38.43	40.15	-1.72	(2.17)
edu_presi	5.26	5.35	-0.09	(1.10)
age_sec	32.76	35.38	-2.61	(2.14)
edu_sec	7.81	7.29	0.52	(1.08)
acti_age	36.07	36.13	-0.05	(2.72)
acti_edu	6.24	5.94	0.30	(1.16)
PHKN activities after the CO formation				
saving	8573.67	7253.04	1320.63	(909.48)
saving_pc	387.48	331.78	55.70	(47.36)
mf	0.21	0.31	-0.098	(0.093)
mip	0.26	0.44	-0.176	(0.100)
comp_mips_no	0.26	0.52	-0.259	(0.128)
lmst	0.21	0.27	-0.057	(0.091)
nct	0.57	0.52	0.051	(0.106)
ndm_nct	0.19	0.27	-0.080	(0.089)

Notes: 1. The Table has been prepared by the author. 2.The standard errors are

Appendix Table: 4.5
Matching between CO proposals and PHKN interventions - female COs Vs. male COs (Strict Match)

		Matching			%age of match	Chi.Sq Test of the equality	
		Match (1)	Mis-match (2)	Total (3)		P-Value	
CO Type	Female COs	5	5	10	50.00	5.245	*
	Male COs	6	32	38	15.79		
	Total	11	37	48	22.92		

1. The number of observations is 48. 2. The Table has been prepared by the author. 3. * p<0.1, ** p<0.05, *** p<0.01.

Appendix Table 4.6

Correlates of matching between members' preference and PHKN interventions (Strict Match)

Variables:	Dependent variable: Strict match dummy
leadership	0.099
	(0.098)
faci_remarks	0.132*
	(0.055)
native	-0.082
	(0.209)
sol_status	0.100
	(0.092)
rel_vil_head	-0.061
	(0.058)
Intercept	0.150
	(0.224)
Mean of the dep.var.	0.229
R-squared	0.035
F-statistics	1.65
Level of Sig.	0.148
Number of Obs.	234

Notes: 1. The number of observations is 234, representing member households only. 2. The Table has been prepared by the author. 3. The robust standard errors in brackets. 4. * p <0.1, ** p <0.05, *** p <0.01.

Appendix Table 4.7

Correlates of matching between co proposals and phkn interventions (by using strict match dummy)

	Dependent variable:	
Variables:	match_stri~2	match_stri~2
1. CO characteristics fixed at the time of formation		
mem_no	0.008	0.009
	(0.013)	(0.013)
incub_per	0.001	0.001
	(0.001)	(0.001)
co_age	-0.002	-0.001
	(0.001)	(0.002)
co_type	-0.198	-0.210
	(0.250)	(0.250)
edu_pc	0.145	0.091
	(0.328)	(0.324)
2. CO leadership attributes		
age_leader$	0.000	0.000
	(0.008)	(0.009)
3. External influence (presence PHKN's facilitator in the meeting)		
faci_remarks		0.083
		(0.130)
4. External influence (Social status of members and network with local elite)		
rel_vil_head		-0.133
		(0.250)
Intercept	0.172	0.178
	(0.583)	(0.580)
Mean of the dep.var.	0.229	0.229
R-squared	0.175	0.186
F-statistics	2.153	1.55
Level of Sig.	0.068	0.172
Number of Obs.	48	48

Notes:
1. The number of observations is 48. 2. The Table has been prepared by the
$ "age_leader" is the average of the age of president and that of secretary while

Appendix Table: 4.8
Comparison of male and female in the subsample of COs (involving matching between CO proposals and PHKN interventions) based on CO outcomes

	Mean for each group		Difference (A)-(B)	
Variable	(A) Female COs (n=35)	(B) Male COs (n=13)	Mean	(S.E.)
tot_savings	7054.63	8434.90	-1380.26	(1850.13)
saving_pc	361.37	298.52	62.85	(69.48)
parti_rate	0.75	0.76	-0.01	(0.02)

No significant difference is found between the male and female COs based on their outcomes

Chapter 5: Impact of Community-based Development Participation on Household Welfare

5.1 Introduction

CBD activities are expected to enhance the participation of the local community in some aspects of project design and implementation, vis-à-vis grassroot level development (Mansuri and Rao, 2004). Several studies in the existing literature shows that participation of local people in CBD activities improves targeting performance, project design, cost-effectiveness, and governance, to a certain extent. However, not many studies identified the positive impact of CBD approach on individual member household's welfare. For instance, Bardhan (2002), Rao and Ibanez (2005), Voss (2008), Bjorkman and Svensson (2009), Casey et al. (2010), and Park and Wang (2010); each focuses on some aspect of household-level welfare that is associated with participation in CBD activities. As stressed by Mansuri and Rao (2004), it is necessary to use representative data vis-à-vis treatment and control groups, collected through baseline and follow-up surveys, in order to implement rigorous CBD project analysis at the household level. Moreover, as argued by Voss (2008), most of the existing literature related to evaluations of CBD/CDD programs focuses on the objectives of programs intrinsic to the CBD/CDD approach, e.g., participation, capacity-building, and local governance,[64] sometimes not focusing on the direct welfare indicators. In short, little evidence exists on the impact of programs on traditional measures of household welfare and access to services.

Park and Wang (2010) claim to address most of the issues related to the existing literature, by examining household-level panel data pertaining to CBD activities undertaken in China. However, the authors themselves acknowledge the existence of certain caveats that may underestimate the true impact of the CBD interventions under review.[65] Voss (2008) can be considered the most relevant study to this chapter; that study investigates the impact of the Kecamatan Development Program (KDP) in Indonesia, on household welfare and access to services. The study claims to focus on the traditional measures of household welfare and access to services that are ignored by most of the existing studies, and it finds no overall impact on per-capita consumption. The program emphasizes the inclusion of women and encourages their participation in the developmental process at the grass-root level. However, the analysis

[64] Voss (2008) elaborates on "objectives intrinsic to the CBD/CDD approach" as improvements in the participation level of community members in the decision-making process at the local level, quality of local governance, and the skills and capacity of the community.

[65] The study completely ignores tangible outcomes like access to basic amenities, credit, and health facilities and intangible outcomes like empowerment.

indicates a negative impact on the consumption of woman-headed households. Moreover, the study employs a narrow definition of "consumption-based welfare indicators."

This chapter differs from most of the existing studies, as it employs an array of traditional (consumption-based) and nontraditional measures (women's empowerment, credit access, and *Zakat* payment[66]) of household welfare. Furthermore, it involves household-level analysis; a unique survey design that comprises two types of control groups, namely, nonmember households (C_1 and C_2), from both CO and non-CO villages; and the special context of the NGO under review, namely, a women focused and women driven NGO functioning in Pakistan's male-dominated society.

Regarding the econometric identification of the impact, I combine cross-sectional analysis for the level analysis, and panel analysis for the change analysis. Panel analyses are helpful in redressing issues associated with the endogenous placement of a CBD program and self-selection into CBD interventions, to a certain extent.[67]

This chapter seeks to assess the impact of CBD participation on member household welfare in terms of consumption, credit access, women's empowerment and *Zakat* payment. This chapter assesses the impact of CBD activities on household welfare in a comprehensive manner; this is not very common in the existing literature, to the best of my knowledge. Hence, the empirical results of this chapter are expected to complement and contribute to the existing literature.

The remainder of this chapter is organized as follows. Section 5.2 describes the data I use, and Section 5.3 outlines the empirical strategy adopted for analysis. Section 5.4 comprises the results of cross-sectional analysis, while Section 5.5 presents the results of panel analysis. Section 5.6 concludes the chapter.

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[66] *Zakat* is an Islamic term that refers to the relinquishing of a fixed portion of one's wealth as a religious tax. It is one of the Five Pillars of Islam, and it is obligatory for every Muslim with wealth over and above a minimum level to annually deduct 2.5 percent of his or her wealth above the minimum level and pay to the needy and poor. However, there exists no enforcement mechanism for its payment. *Zakat* is mostly paid directly to the poor dwelling the same or neighboring village. In this chapter, I employ *Zakat* payment by a household as a useful indicator of a household's well-being and wealth. The potential recipients of *Zakat* are identified with great care through the best use of the local intelligence. Therefore, receipts or payments of *Zakat* in a household can be used as a yardstick to distinguish between poor and non-poor households. The poverty identification with *Zakat* can also be compared with conventional ways of poverty identification.

[67] Weaker assumptions are employed to redress the mentioned issues—the details of which will be presented in Section 5.3, which explains the empirical strategy of the chapter.

5.2 Data

To achieve the objectives of this chapter, I employ the following datasets in analysis:

i. Household benchmark survey (Survey #3 of Table 2.4, Chapter 2)
ii. Household resurvey (Survey #5 of Table 2.4, Chapter 2)

I construct a balanced panel dataset comprising 569 households (a subset of 583 households belonging to member [*T*-group] and nonmember [C_1-group and C_2-group] households) by combining the information captured by the aforementioned surveys. I include the subsample of 569 households that were successfully surveyed in both the benchmark and resurvey and whose membership status did not change. Fourteen households are excluded, owing to attrition and the change in the membership status.[68] To address attrition bias, I employ several attrition-bias checks that confirm the nonexistence of attrition bias (Annex 5.1, page 120). I present in Table 5.1 the summary statistics of the key household-level variables, under the seven major categories for the mentioned datasets. At first glance, no changes can be seen in the variables related to household assets, education, or demographic indicators. On the other hand, visible changes can be seen in the variables that relate to household welfare measures (e.g., consumption measures); credit access; women's mobility (an indicator of women's empowerment)[69]; and those representing susceptibility to natural disasters and income inflow for the period between the benchmark and resurveys, which I will further elaborate upon below.

Noticeable changes can be seen in the figures pertaining to household income flow during the period under review. An increase of 8 percentage points is witnessed among the households that receive remittances from family members who work outside their home towns (both inland and overseas) over the period. The proportion of households paying *Zakat* also increased by 20 percentage points, in comparison to the benchmark-level figures for the same, a three-fold increase compared to the benchmark level. As a useful indicator of household well-being, I use two indicators of *Zakat* payment as additional variables to assess the PHKN impact on household welfare. The two indicators are *zu_out*: a dummy variable which takes a value of 1 if

[68] See Table 2.5 for the distribution of these 14 households. All of the 12 attritted households are C_2-group households.

[69] Women mobility is the best possible way to capture empowerment of women, in this context. It is pertinent to mention that women mobility is very sensitive issue. Therefore, a great deal of care has been taken while collecting information on the women mobility from the sample households, i.e. indirect and coded questions were asked from the households. To formulate reliable indicators of the women empowerment and collect clean data, I consulted the Executive District Officer (EDO) - Women Development and Social Welfare Department, Haripur a number of times and am grateful to him for his valuable inputs in this regard. I incorporated this information in training modules for enumerators and preparation of survey tools used for compilation of the dataset used in this dissertation. Moreover, for all three rounds of the households' surveys, temporary enumerators were hired with no direct association with either PHKN and/or local communities. Therefore, positive response bias can easily be out ruled.

the household have paid *Zakat* during the reference period, and *annl_zu_out*: a variable showing *Zakat* paid in PKR. It will be interesting to investigate further among the member (*T*-group) and nonmember (C_1-group and C_2-group) households who is receiving more and/or paying more *Zakat*.

As mentioned in the introduction, this chapter carries out comprehensive welfare analysis that employs five different measures of aggregate consumption[70]: total expenditures (*tot_exp*), food expenditures (*exp_fd*), nonfood expenditures (*exp_nonfood*), total per-capita expenditures (*exp_pc*), and food expenditures per adult equivalent (*food_pae*) (Table 5.1). These consumption measures will indicate the direct impact of CBD interventions. In Table 5.1, an overall decline in consumption measures can be seen over the period between the benchmark and the resurvey. By examining the data closely, one can see that the total expenditures register a 44-percentage-points reduction over the period, the impact of which translates into changes in other consumption measures. For instance, there were 38 and 5-percentage-point reductions in food and nonfood consumption, respectively. Bearing in mind prevailing widespread shocks like the 2010 floods in the study area and the 2011 floods in other parts of the country—both of which were followed by food-price hyperinflation—this noticeable decline in consumption measures is understandable. However, it will be interesting to analyze how the adverse impact of the shocks is distributed across the *T*-group, C_1-group, and C_2-group households, and whether or not the *T*-group households will be able to cope with these negative externalities and smooth their consumption in the post-shock period, or vice versa. In other words, such findings will also indicate the resilience of the *T*-group in withstanding shocks. As a precursor analysis, the distribution of the total consumption of the households, by treatment status and survey year, is graphically shown in Figure 5.1. From this figure, it is difficult to infer any difference across the various treatment statuses; this chapter will examine whether this holds after controlling for other variables.

Household access to credit, an intermediate welfare indicator,[71] declined four times over the

[70] I compiled the annual expenditure in the following way. First, I gathered information on non-food household expenditure for the reference period of one year preceding the household survey. Second, I gathered information on food consumption (both paid and unpaid) for the reference period of one week preceding the household survey. The weekly food consumption was multiplied by 52 to get annual consumption. The value of unpaid food consumption was imputed using the village prices. By aggregating the annual values of all consumption items, I obtained the total expenditure. All monetary values employed in this dissertation, including expenditures, are nominal. Ideally, I should have used real monetary values but due to the non-availability of a reliable deflator corresponding to my study, I had no other choice but to opt for the use of nominal values. It is expected that the use of real values does not affect the current results, as inflationary effects are similar across the treatment and control groups.

[71] Credit access is an indirect measure of welfare. It is known that credit in the form of consumption loans can smooth the consumption of a recipient household and hence enhance its welfare. To collect data

period under review.[72] On the other hand, a positive development during the period is the overall improvement in women's empowerment, namely, an 11-percentage-points increase in the mobility of women in the study area. Furthermore, an overall decline in WBAs among the households can also be seen over the time; this reduction might be because of AWBAP treatments, which the next chapter analyzes in detail.

5.3 Empirical Strategy

In this chapter, I compare the welfare indicators of CO (*T*-group) and non-CO (C_1-group and C_2-group) households. Unlike in Chapter 3, where I compare the *exogenous* characteristics of the treatment and control households, here I compare their *endogenous* variables. However, the net difference between them may also reflect confounding factors; in order to interpret the net difference, I need to clarify these factors.

First, the net observed difference between the member (*T*-group) and nonmember (C_1-group and C_2-group) households can be owing to the causal impact of treatment on the households. It is this factor that I wish to identify in this chapter. However, the observed difference may also reflect selection into PHKN treatment: PHKN's endogenous placement, villages' self-selection in forming a CO, and household-level self-selection in joining the CO, conditional on the successful formation of a CO in the village.[73]

A comparison of *T*-group households and C_1-group households (member and nonmember households in CO villages) provides suggestive evidence of the net effect of the causal impact of treatment and household-level self-selection. A comparison of *T*-group households and C_2-group households (nonmember households in non-CO villages) provides suggestive evidence of the net effect of the causal impact of treatment, PHKN's endogenous placement, village-level self-selection, and household-level self-selection.

As a starting point, I employ cross-sectional analysis by using the benchmark data. I compare the member households (*T*-group) with nonmember households (C_1 and C_2-group) in villages

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on household credit access, I have used standard module of household credit access in my survey. After initial assessment of the data gathered, I found that the number of households with no need for credit was negligible (which is, I think, due to a surpassing demand for credit in study area, which compete for interest free credit from relatives and friends). Therefore, in such a situation the actual use of credit by household constitutes a good indicator of credit access.

[72] According to details provided by credit sources, the majority of households with access to credit had borrowed from either relatives or friends. It is natural for individual credit sources to dry up in the wake of covariate shocks and subsequent hyperinflation.

[73] For further details, see Khan et al. (2011).

with and without COs. The coefficients on the treatment status from the cross-sectional analysis will clarify the net impact of selection and treatment effect. In other words, the cross-sectional analysis will generate an extension of the summary statistics shown in Table 5.1, which distinguish the treatment status. First, I conduct bivariate analysis; then, for multiple regression analysis, I run regression models using five consumption-based welfare indicators (i.e., total expenditure, food expenditure, nonfood expenditure, total per-capita expenditure, and food expenditure per adult equivalence unit), credit access, and women's mobility (proxy for women's empowerment) as dependent variables, and two dummy variables representing the C_1 and C_2-groups, household-level assets, income flow, and shocks as explanatory variables.[74] I employ similar model(s) for multivariate analysis, while using both the benchmark and resurvey data.

To control the selection factor as much as possible, in the main analysis of this chapter, I carry out panel analysis with regards to consumption, credit access, and women's empowerment. In fact, the panel analysis can more reliably identify the causal impact, as most of the unobservable factors that affect program participation can be controlled by household-level fixed effects. For the panel analysis, I adopt the difference-in-difference (DID) econometric technique by using the following model:

$$Y_{it} = b_0 + b_1 X_i + b_2 T_t + b_3 X_i * T_t + e_{it}. \quad (5.1)$$

In Equation 5.1, Y_i represents outcome variables (i.e., consumption measures, credit access, and women's empowerment) that are endogenous to PHKN interventions. X_i is a dummy variable that takes the value of 1 for member households (T-group) and 0 for nonmember households (C_1-group and C_2-group).[75] T is also a dummy variable that represents the resurvey (posttreatment period) and takes a value of 1 for the posttreatment period, and 0 otherwise.[76] b_3 is the coefficient of the interaction between X_i and T_t; it provides an DID estimator through the use of OLS. e_{it} represents the error term. By taking the first difference of Equation 5.1, the resultant equation, that is, Equation 5.2, will be DID.

$$\triangle Y_{it} = b_2 + b_3 X_i + \triangle e_{it} \quad (5.2)$$

[74] To examine whether the household-level variables representing demographics, vulnerability, assets, and income shocks are more predetermined than consumption or empowerment variables, I first run regressions using one of the aforementioned household-level variables as the dependent variable and a selected set of variables of interest and two additional dummy variables for C_1 and C_2-group households (the reference-category T-group households) as explanatory variables. The results, which are available upon request, mostly confirm the bivariate pattern. See Khan et al. (2011) for further details.

[75] X_i = {1 for treatment, 0 for control}.

[76] t = 1, 2, and T_t = {0 when t = 1, 1 when t = 2}.

It is known that PHKN membership is not allocated randomly; therefore, E (e_{it}, X_i) ≠ 0, and hence, Equation 5.1 cannot be applied in this case. Equation 5.2 provides the causal impact of treatment, but only if E ($\triangle e_{it}$, X_i) = 0, which is a slightly weaker assumption than E (e_{it}, X_i) = 0. Hence, I estimate Equation 5.2 first; however, E ($\triangle e_{it}$, X_i) = 0 may not be satisfied. Therefore, I employ a further weaker assumption, i.e. E ($\triangle e_{it}$, X_i |Z_{it-1}) = 0, where Z_{it-1} refers to initial household characteristics. If this assumption is valid, then I can safely employ the following specifications for the impact analysis;

$$\triangle Y_{it} = b_2 + b_3 X_i + Z_{it-1} b_4 + \triangle e_{it} \quad (5.3)$$

5.4 Results of Cross-sectional Analysis

In this subsection, I compare the welfare indicators of the *T*-group to those of the C_1-group (or C_2-group), using cross-sectional analysis. I first carry out bivariate analysis, that is, a mean comparison of welfare indicators, followed by multivariate analysis of the same for the household benchmark and resurvey data, separately.

5.4.1 Mean comparison of welfare indicators, using the benchmark data

Table 5.2 presents the results of the mean comparison of welfare indicators, using the benchmark data. Based on the consumption indicators, no statistically significant difference is found between the *T*-group and C_1-group households for any of the five measures of consumption welfare. However, a statistically significant difference between the *T*-group and C_2-group households is found, based on their total, food, nonfood, and per-capita expenditures, and food consumption per-adult equivalent.[77] This suggests that the C_2-group households have higher consumption-based welfare than those in the *T*-group.

Furthermore, the C_2-group households have better access to credit than do the *T*-group households; however, the *T*-group and C_1-group households have similar levels of credit access.

As far as women's empowerment is concerned, women belonging to the *T*-group are more empowered than those belonging to either C_1-group or C_2-group households (at the 1-percent significance level). The women belonging to the *T*-group can freely move within their villages. A possible explanation for this significant difference might be the causal effect of PHKN interventions on women's empowerment, and/or that of self-selection (i.e., comparatively liberal households are more likely to join the *T*-group).

[77] Four of five consumption measures are significantly different, levels of significance.

A striking difference is found between the *T*-group and C_1-group households in terms of *Zakat* payment (at the 10-percent significance level). On the other hand, the difference is insignificant in terms of actual amount of *Zakat* paid in PKR. This might be either the causal impact of the PHKN's HRD training in enhancing the earning ability of *T*-group households,[78] and/or the sensitization process that might have enhanced a sense of altruism among the households that belong to the *T*-group, and/or self-selection within a village, that is, the households in the *T*-group are inherently altruistic.

Underlying changes in the mentioned welfare indicators are other household-level variables that also changed (Appendix Table 5.1). In this paragraph, I will briefly discuss these variables. According to Appendix Table 5.1, no difference is found among the *T*-group, C_1-group, and C_2-group households in terms of most of their income-flow indicators.

The *T*-group and C_1-group households are similar in terms of their asset holdings. C_2-group households have better dwelling conditions and access to amenities than *T*-group households;[79] the former also hold better land in terms of value.[80] All three groups of households are similar in terms of demographic characteristics. *T*-group households are more susceptible to natural disasters (I use household-level impact of the 2010's floods as a rough proxy for susceptibility to the natural disaster)[81] than are those in the C_1-group; however, the difference between the *T*-group and C_2-group households vis-à-vis susceptibility to natural disasters and shocks is insignificant. In the age of the internet, satellite TV, and cable TV, a large proportion of *T*-group households still own and use radios, compared to those in the C_2-group. The aforementioned findings suggest that households in the *T*-group are poorer than those in the C_2-group.

At this juncture of the analysis, the results reflect village-level selection (i.e., both PHKN placement and village self-selection)—which is to say, the poorer villages are more likely to comprise *T*-group households. From this point onward, I will attempt to determine whether

[78] PHKN has heavily invested in HRD training among its member groups, to inculcate income-earning (marketable) skills and hence to harness a sustainable livelihood for the local people.

[79] A highly significant difference (at the 1-percent significance level) is found between the *T*-group and C_2-group households in terms of their dwelling conditions (household boundary) and access to sanitation facilities, that is, toilets and drainage, as well as access to basic amenities like natural gas for cooking.

[80] A slight difference (at the 10-percent significance level) is found between the *T*-group and C_2-group households, based on the value of their respective land holdings.

[81] It is a fact that *T*-group households were members of a CO even before the floods. However, bearing in mind exogenous characteristic of floods, its impact on a village (and/or household) can be a good proxy for assessing the level of vulnerability of a village (and/or household) to the natural disasters. It is worth mentioning, the region has also been affected by floods in past, but with my current dataset I am not able to capture this information.

PHKN interventions are strong enough and have a large enough impact (on the *T*-group) to mitigate negative selection effects.

To summarize the benchmark-level bivariate analysis, *T*-group households are poorer than C_2-group households in terms of asset holdings, credit access, and consumption. Moreover, *T*-group households are more susceptible to natural disasters and shocks than those in the C_1-group. A positive and insignificant difference between the *T*-group and C_1-group is found for most of the welfare indicators; however, women belonging to *T*-group households are more empowered those in either the C_1-group or the C_2-group. A significantly larger number of *T*-group are paying Zakat as compared to both the C_1-group and C_2-group.

5.4.2 Mean comparison of welfare indicators, using the resurvey data

To determine whether the results of the benchmark-level analysis also persist in the course of the resurvey analysis, I repeat the bivariate analysis (for the variables shown in Table 5.2) by using the resurvey data; the results thereof are presented in Table 5.3. At first glance, the results seem to be similar to those found at the benchmark level. However, for the period under review, a downward trend can be seen for major welfare indicators—namely, household consumption and credit access—while an upward trend can be seen for the variables representing women's mobility, susceptibility to shocks, and household income.

Despite an overall decline in resurvey-level consumption (Table 5.3), differences between *T*-group and C_2-group households are statistically significant for all consumption measures, save for nonfood expenditures. Hence, households belonging to the C_2-group still have higher consumption-based welfare than do those in the *T*-group.

Credit access among all three groups of households has declined compared to their respective benchmark levels. The decline has possibly eliminated the benchmark disparity between the *T*-group and C_2-group households. The reason for this "catch up" might be either the impact of PHKN interventions on the liquidity gains of the *T*-group or an overall liquidity crunch among all the sample households. However, the results suggest that the decrease is more likely because of overall liquidity gains stemming from a noticeable rise in the number of *Zakat*-paying households within the *T*-group, rather than the liquidity crunch.[82] It will be interesting to see in multivariate analysis how credit access differs across the three groups of households, once controlling for the other factors. A significantly larger proportion of *T*-group households (at the

[82] The same is the case when it comes to the amount of *Zakat* paid by the *T*-group households.

1-percent significance level) than of either the C_1-group or the C_2-group households are paying *Zakat*. This could reflect the improvement of *T*-group households' well-being.

The brighter side of the bivariate analysis is that its results suggest an overall improvement in women's empowerment (i.e., women's mobility). The difference between the *T*-group and C_1-group (or C_2-group) households in terms of women's empowerment is highly significant, which suggests a high level of empowerment among *T*-group households, in comparison to the C_1 or C_2-group households.

Patterns similar to the benchmark-level-induced changes in other variables, as seen among the households, continue to persist. As far as the households' income-flow measure, i.e. the number of full-time employed members in a household, is the same across all three groups of households. According to Appendix Table 5.2, results similar to the benchmark-level analysis are found for the households' access to sanitation facilities (e.g., toilets and drainage) and amenities (e.g., natural gas). Moreover, results similar to the benchmark level are found for radio ownership and use among the *T*-group households, for both the benchmark and resurvey data. Under the aforementioned categories, as discussed in the previous subsection, the difference between the *T*-group and C_2-group households is statistically significant, while that between the *T*-group and C_1-group households is insignificant. Consistent with the results of the benchmark-level analysis, all three groups of households are similar in terms of their demographic characteristics.

5.4.3 Summary of the bivariate cross-sectional analysis results

To summarize the results of the benchmark and resurvey-level bivariate analysis, the households belonging to the C_2-group have better access to assets and amenities than do those belonging to the C_1 or *T*-groups. Furthermore, the former has a higher level of consumption-based welfare than do the C_1 and *T*-groups; however, women belonging to the *T*-group are more empowered than those belonging to the C_1 or C_2-groups. Similarly, *T*-group is in better position to pay *Zakat* than those belonging to the C_1 or C_2-groups. Hence, I can say that the PHKN targets not only poorer villages (as shown in Chapter 3 of this dissertation), but also poorer households (in comparison to the C_2-group households in the non-CO villages).

PHKN membership is more effective in having an impact on intangible and short-term welfare measures like women's empowerment, credit access, and Zakat payment (to a certain extent); however, it is less effective in influencing tangible welfare measures like consumption, which

require relatively long-term interventions.

5.4.4 Multivariate analysis using benchmark survey data

To determine whether patterns similar to those found in the bivariate analysis persist while controlling for other factors, in this subsection I conduct multivariate analysis by using consumption, credit access, and women's mobility as welfare indicators. I report in Tables 5.4 (A–B) the results of multivariate analysis while employing benchmark data.[83] I find a stark contrast between the treatment and control households, similar to that found in benchmark bivariate analysis. In summary, *T*-group households have significantly lower consumption and credit access but higher empowerment than both the C_1-group and C_2-group households do. *T*-group households are slightly more likely to afford paying *Zakat* than the C_1-group but poor access to credit than C_2-group. Furthermore, *T*-group households have consumption levels similar to those of the C_1-group households, but the former have a higher level of women's empowerment than does the latter.[84]

All the other variables behave according to expectations; examples thereof include household demographics and assets, and income inflow. The household size has a positive correlation with aggregate consumption measures[85] and credit access, but a negative correlation with per-capita expenditures and food expenditures per-adult equivalence unit. The households with a higher level of their heads' education and those with remittance receipts have higher consumption and higher propensity to pay *Zakat*; the former also have higher women's empowerment. Unlike with benchmark-level bivariate analysis, an insignificant impact of shocks—namely, those idiosyncratic and covariate—on all measures of welfare is found.

[83] The women's mobility variable is an indicator variable, that is, a higher value indicates higher mobility. An ordered-Probit model with the same explanatory variables has been estimated for the same; the results, which can be furnished upon request, are qualitatively the same as those shown in Table 5.4 (B).

[84] Bearing in mind the possible difference between female and male COs, based on their characteristics, the re-estimation of these regression models while excluding the *T*-group households that belong to the male COs was carried out by Khan et al. (2011). That study's results, reported in Appendix Table 4, are quite similar to those reported here.

[85] Here, "consumption measures" refers to total expenditures, including food and nonfood expenditures.

5.4.5 Multivariate analysis using resurvey data

By using models similar to those used in the previous subsection, I generate regression estimates (Tables 5.5 – A–B).[86] Consistent with the results of the resurvey-level bivariate analysis, a sharp benchmark-level contrast between the treatment and control households becomes weaker in the resurvey-level multivariate analysis. In short, *T*-group households still have lower consumption (which is significant only for food expenditure, both aggregate and per-adult equivalence), but higher empowerment than C_2-group households. Furthermore, *T*-group households have higher women's empowerment and higher propensity to pay *Zakat* than both C_1-group and C_2-group households; this finding is more or less consistent with those of the previous analysis. It will be interesting to note in the balance of the analyses the direction of *T*-group households' welfare.

Similar to the previous subsections, the coefficients on other household variables bear the expected signs. Household size correlates with consumption measures[87] in a manner similar to that found in the benchmark analysis, while there was no correlation with credit access or women's empowerment.[88] The households with more educated heads have higher consumption, but no longer have higher women's empowerment, suggesting spillover of women empowerment among the least educated and conservative households. Unlike that seen in the benchmark analysis, remittances are no longer associated with the consumption of the recipient households. Shocks have an impact similar to that discussed previously.

As a robustness check, I carry out multivariate analysis by regressing resurvey-level welfare indicators on benchmark-level household characteristics, that is, lagged variables. Since household asset indicators are also endogenous, this specification could be better than Table 5.5, in terms of endogeneity problems. The regression results for this subsection are presented in Tables 5.6 (A–B).[89] According to those results, the benchmark-level difference in consumption between the *T*-group and C_2-group becomes weaker in the resurvey analysis. *T*-group households have slightly lower food consumption (for both aggregate and adult-equivalence

[86] An ordered-Probit model with the same explanatory variables has been used for women's mobility; the results, which can be furnished upon request, are qualitatively similar to those shown in Table 5.5 (B).
[87] Household size correlates positively with the aggregate consumption of food (for the other consumption measures, no significant correlation persists); there is a negative correlation only with food expenditures per-adult equivalence unit (for per-capita consumption, correlation is no longer significant).
[88] Unlike in the benchmark analysis, household size no longer has a statistically significant correlation with credit access and women's empowerment.
[89] An ordered-Probit model with the same explanatory variables has been estimated for women's mobility; the results—that can be furnished upon request—are qualitatively the same as those seen in Table 5.5 (B).

measures for the same), which is somewhat similar to the results of the resurvey analysis. Furthermore, *T*-group households still have a higher level of women's empowerment and *Zakat* payment than do the C_1 and C_2-group households, and this has been robustly shown throughout cross-sectional analysis.

The coefficients on other variables have signs similar to those seen in the previous analysis. For example, household size correlates positively with consumption, but correlates negatively with per-capita food expenditures and per-adult equivalence unit. Similar to the benchmark and resurvey analysis, households with higher education[90] have higher consumption levels. Households with higher education also no longer have a higher women's empowerment (which is similar to the resurvey results, but unlike those of the benchmark analysis). The women in remittance-receiving households still enjoy higher empowerment. Finally, shocks do not impact consumption-based welfare, and this finding is consistent with the results seen in subsections 5.4.3 and 5.4.4.

5.4.6 Summary of cross-sectional analysis results

To conclude the cross-sectional analysis, the overall results show that despite micro and macro-level shocks, *T*-group households possess a consumption-smoothing ability. In other words, *T*-group households have shown themselves resilient in their ability to withstand shocks and arrest deterioration in their current level of consumption, in comparison to both C_1 and C_2-group households. Moreover, the results suggest that *T*-group households are gradually "catching up" with C_2-group households, at least in terms of nonfood consumption; this may be due to membership of the PHKN (treatment-effect) and/or selection effect (both village and household-level). Furthermore, it has been shown in this section, quite robustly, that households belonging to the *T*-group have high levels of women's empowerment and *Zakat* payment compared to both C_1 and C_2-group households. This, again, may be because of selection or casual effect, or both. Based on my field observations, the results are more likely owing to the causal impact of PHKN interventions—that is, the membership of a CO and participation in CBD activities improves a member household's welfare. In the coming sections of this chapter, I will attempt to assert this claim through the results of panel analysis.

[90] This refers to households with more educated heads, in terms of their years of schooling.

5.5 Results of Panel Analysis

To determine whether evidence suggestive of the positive impact of participation in CBD activities—found in the cross-sectional analysis—holds once controlling for the household-level fixed effect, in this section I perform panel analysis by using balanced panel data comprising 569-member *T*-group, C_1-group, and C_2-group households. This section comprises two subsections—namely, bivariate analysis that involves DID, and multiple regression analysis—the details of which will be given as I proceed.

5.5.1 Results of bivariate analysis (using difference in difference)

Table 5.7 (A) provides a mean comparison of changes in the welfare indicators, while Table 5.7 (B) presents the same for intermediate variables. As described in the methodology section of the chapter (Section 5.3), as a special case, when vector Z_{it-1} is not included in Equation 5.3, it becomes a standard DID. Hence, I report in Tables 5.7 (A–B) the DID results derived by excluding Z_{it-1} from Equation 5.3. According to Table 5.7 (A), despite there being an overall decline in consumption over the period among the three groups of households—namely, the *T*-group, C_1-group, and C_2-group—the extent of deterioration (at least in cases of total and nonfood expenditures) among the *T*-group is less than that of the C_1-group or C_2-group. However, only the differences between the *T*-group and the C_2-group are significant (at 10–percent and 5–percent significance level for total and nonfood expenditures, respectively.

It is worth mentioning that the study area saw a "credit crunch" during the period under review.[91] Apparently, the crunch had the lowest adverse effect on the *T*-group households, relative to the C_1-group and C_2-group households; nonetheless, only the difference between the *T* and C_2 groups is statistically significant. Women's empowerment has also improved for the *T*-group households, compared to the C_1 and C_2-group households; however, only the difference between the *T*-group and the C_2-group is statistically significant. Regarding *Zakat* payment, a significantly larger number of *T*-group households are among the *Zakat* payers, compared to both C_1 and C_2-group households. These results are consistent with those of the benchmark and resurvey bivariate analyses, discussed in subsections 5.4.1 and 5.4.2, respectively. DID results support my previous claim that participation of a household in CBD activities improves its welfare. The results show an insignificant difference between *T*-group and C_1-group households in terms of the aforementioned welfare indicators.

[91] The credit sources— mostly individual lenders that comprise family members and friends—dried up in the wake of food-price hyperinflation and covariate shocks, both of which had occurred in the study area.

Moreover, the DID results of the intermediate variables (Table 5.7 – B) show an insignificant difference between *T*-group and C_1-group households for most of the intermediate variables.

In summary, DID analysis shows that the *T*-group households have the ability to maintain their consumption at a certain level, over and above the other households. Despite there being difficult situations, *T*-group households have slightly better credit access than those in the C_2-group. Compared to that seen with the C_1-group, the DID impact was favorable but statistically insignificant; this suggests that *T*-group households are more resilient in withstanding micro and macro-level shocks, compared to their C_2-group counterparts. The *T*-group households have higher women's empowerment and *Zakat* payment than either of the C_1 and C_2-groups. Now it will be interesting to see whether a similar pattern persists while controlling for other factors—something I will undertake in the next subsection by extending the DID analysis by including initial household characteristics, that is, direct estimation of Equation 5.3.

5.5.2 Results of multiple regression analysis

In the empirical strategy section (3.3), the estimation of Equation 5.3 is used in the undertaking of multiple regression analysis by using panel data. I employ regression models similar to those used in the cross-sectional multiple analysis, after making appropriate changes. I regress the first difference of five consumption-based welfare indicators[92]—namely, credit access and women's mobility[93] (as dependent variables) on two dummy variables that represent the C_1 and C_2-groups; and household initial characteristics (i.e., lagged variables pertaining to household-level assets), income flow, and shocks (as explanatory variables). I use a balanced panel of 569 households for the analysis, and report regression estimates in Tables 5.8 (A–B).

The signs on most of the coefficients of consumption measures are similar to those seen in the DID analysis (Table 5.8 – A). However, the consumption-based difference between the *T*-group and C_1-group (and C_2-group) households is statistically insignificant.

The *T*-group households' access to credit has slightly improved (at the 10-percent significance level), compared to that of C_2-group households. Moreover, consistent with the results of most of the previous analyses, *T*-group households have higher women's empowerment than either the C_1 or C_2-group households.

[92] Consumption-based welfare indicators are total expenditure, food expenditure, non-nonfood expenditure, total per-capita expenditure, and food expenditure per-adult equivalence unit.
[93] This is a proxy variable for women's empowerment.

I also regress the first difference of the dummy for *Zakat* payment and the variable representing the amount of *Zakat* paid by a household (in PKR) on the explanatory variables, similar to those employed in Table 5.8. I report the regression estimates in Table 5.8(C), where Model 1 is used for *Zakat* payment and Model 2 for the amount of *Zakat* paid. According to that table, both the C_1 and C_2-group households are paying less *Zakat*, in terms of the numbers of households involved and the amount paid, than the *T*-group households; however, the difference is statistically significant only in the case of the C_2-group households. A significantly larger number of *T*-group households (at the 1-percent significance level) are paying *Zakat* than the C_2-group households; the same is true vis-à-vis differences between the groups based on the actual amount of *Zakat* paid, but with slightly lower statistical significance (at the 5-percent significance level). Moreover, the results presented in Table 5.8(C) are consistent with those reported in Table 5.8 (A-B).[94]

To summarize, despite there being macro and micro-level shocks, the consumption and credit access of *T*-group households has deteriorated less than those of the C_1 and C_2-group households (the difference is significant only in case of *T*-group and C_2-group). Participation in CBD activities has had a positive but statistically insignificant impact on the *T*-group, compared to the C_1-group. It has been robustly shown that women in *T*-group households are more empowered than those in C_1 or C_2-group households.

5.6 Conclusion

This chapter showed that PHKN membership—that is, participation in CBD activities—can improve the welfare of member households in terms of women's empowerment, credit access, and *Zakat* payment, to a certain extent. On the other hand, that participation has minimal impact on consumption growth. The results presented in this chapter are robust and support my earlier claim that *T*-group households are more resilient against micro-level shocks.

My earlier assumption was that the statistically insignificant difference between the *T*-group and C_1-group households might be owing to there being one or more spillover effects associated with knowledge,[95] collective action (regarding MIP), and demand-driven[96] spillovers. Since the

[94] It is important to mention here that statistical significance diminishes, once the Inverse Mills Ratio (IMR) is added to both models of Table 5.8(C) as a check for attrition bias. For details, see Appendix Table 5.8 (C) of Annex 5.1 (Attrition Bias).

[95] Knowledge spillover is most likely to be gained through frequent informal contacts and discussions between *T*-group and C_1-group households in a CO village in the long term. The latter can experience knowledge spillover vis-à-vis the soft skills acquired by the former in the course of HRD training,

T-group and C_1-group households reside in close proximity to each other, spillover effects, particularly that pertaining to knowledge and collective action, can naturally occur among these groups' households. Strikingly, my assumption proved to be true only in the case of credit access.

As extension, it is of interest to evaluate the impact of PHKN participation differentiated by match and mis-match cases and by the type of PHKN interventions. However, the match between household preference and CO proposal and the decisions regarding the type of intervention to be given are endogenous. Owing to the non-availability of good instruments that can be employed as control for these endogeneity issues, this is left for future research. The current exercise is an attempt to evaluate the impact of participation (the first stage of PHKN intervention) rather than the impact of individual interventions in later stages.

There could be several possible explanations regarding the results related to consumption-based welfare. First, the minimal impact of PHKN membership on consumption may imply that households are not only poor in terms of observable characteristics (attributes), but also in terms of unobservable characteristics that determine consumption growth. Hence, participation in CBD activities may be effective in maintaining a certain level of consumption, but may not be that effective when it comes to consumption growth.

Second, although CBD participation may effectively bring about intangible and/or behavioral changes—e.g., women's empowerment among its member communities—and help achieve short-term goals like improvements in credit access, it might be less effective in making a direct impact on the consumption of member households—something that requires considerably large-scale interventions. According to ADB (2006), most CBD/CDD projects have a one-year subproject cycle; this is too short a timeframe in which to make any significant impact on the long-term welfare of the participating households.

Third, there might be some implicit cost associated with participation in CBD activities. Owing to the special context of the study area, one can expect there to be a cost where women are systematically excluded from participatory development (Agarwall, 2001). The exclusion may adversely impact the consumption growth of member households. More specifically, participation may incur some psychological (e.g., harassment) and physical fatigue (duress, violence)—particularly among women, who comprise the majority of members, and especially if they work with a women-focused and women-driven NGO in a male-dominated society,

through mere observation.

[96] A demand-driven spillover effect is associated with a general equilibrium level in a CO village, because of demand generated through CBD activities.

mostly against the local elite. Hence, the aforementioned factors may adversely impact the overall welfare of the member households. Investigation of these possibilities is left to be explored in future research.

Figure 5.1 (A)

Total expenditures for T-group households by survey-year

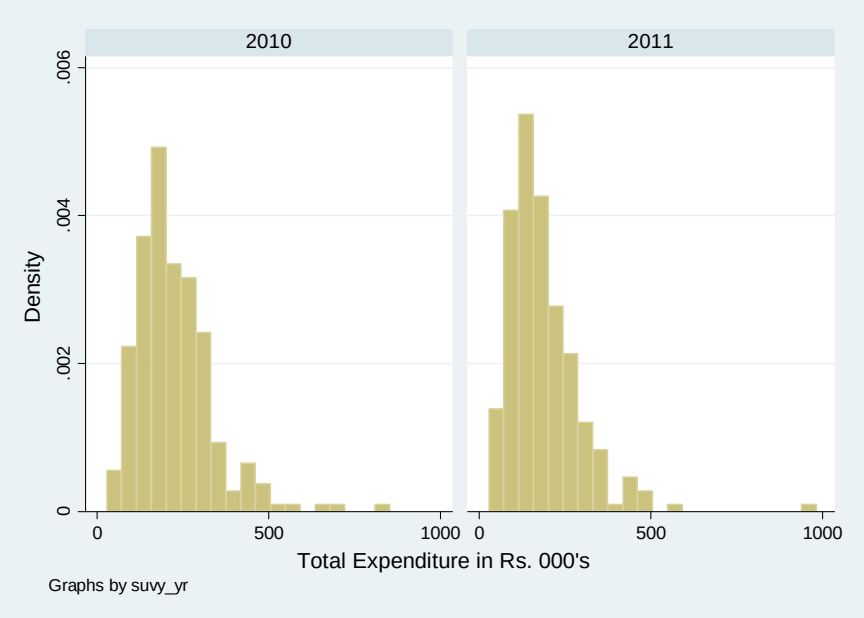

Figure 5.1 (B)

Total expenditures for C1-group households by survey-year

Figure 5.1 (C)

Total expenditures for C2-group households by survey-year

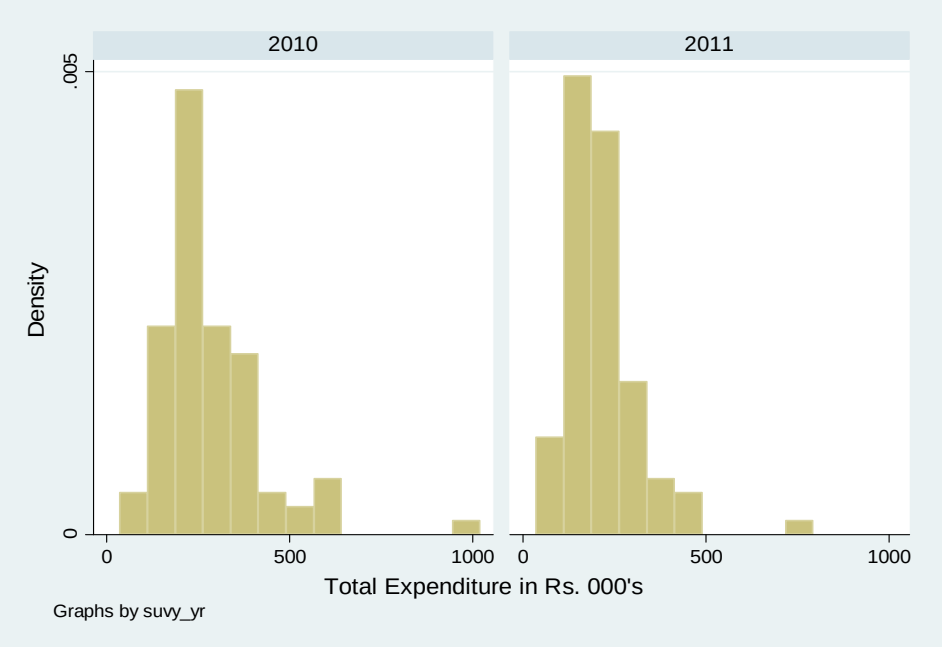

Table. 5.1

Summary statistics of household-level variables

		Baseline Survey				Follow-up Survey			
Description	Variable	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Household asset indicators.									
area of house (in Marlas)	area_hh	9.60	6.13	1	40	9.61	6.13	1	40
house floor (*Pakka:* paved=1 *Kachha:* dirt floor=0)	h_floor	0.12	dummy	0	1	0.13	dummy	0	1
house condition (Pakka:concrete-house=1 Kachha:mud-house=0)	h_cond	0.46	dummy	0	1	0.47	dummy	0	1
house boundary exist; Yes=1, otherwise 0	h_boundry	0.91	dummy	0	1	0.91	dummy	0	1
number of room in house	room_no	2.82	1.30	1	9	2.83	1.32	1	9
toilet exists in house; yes=1, otherwise 0	toilet	0.91	dummy	0	1	0.90	dummy	0	1
drainage system is available in house; yes=1, otherwise 0	drainge	0.42	dummy	0	1	0.43	dummy	0	1
electricity connection in household: yes=1, otherwise 0	elect	0.99	dummy	0	1	0.99	dummy	0	1
TV is owned and used by household: yes=1, otherwise 0	tv	0.62	dummy	0	1	0.63	dummy	0	1
telephone (landline) connection in household: yes=1, otherwise 0	telephone	0.13	dummy	0	1	0.13	dummy	0	1
cell phone is owned and used by household: yes=1, otherwise 0	cellphone	0.88	dummy	0	1	0.89	dummy	0	1
internet access and use by household: yes=1, otherwise 0	internet	0.00	dummy	0	1	0.01	dummy	0	1
cable TV connection; yes=1, otherwise 0	cab_tv	0.01	dummy	0	1	0.00	dummy	0	1
radio owned by the household; yes=1, otherwise 0	radio	0.30	dummy	0	1	0.30	dummy	0	1
internet access and use by household for cooking and heating; yes=1, otherwise 0	gas	0.07	dummy	0	1	0.07	dummy	0	1
total landholding (area in Kanals)	tot_area_ol	6.39	11.39	0	100	6.79	11.28	0	100
land value (in PKR.000,000's)	lan_val	0.59	1.51	0	25	0.78	1.80	0	25
livestock value (in PKR.000,000's)	livestck_v~e	0.02	0.03	0	0.27	0.05	0.09	0	0.78

Note: 1. a balanced-panel of 569 households is used for summary statistics and for the rest of analysis in Chapter 5. 2. The table is prepared by the author.

Table. 5.1
Summary statistics of household-level variables

Description	Variable	Baseline Survey Mean	Std. Dev.	Min	Max	Follow-up Survey Mean	Std. Dev.	Min	Max
Demography									
household size	hhsize	6.17	2.68	1	16	6.29	2.73	1	16
female/male ratio	fem_rate	1.11	0.88	0	5	1.14	0.88	0	5
household head's age	hh_age	49.65	14.01	20	90	50.64	14.01	21	91
household head is literate; yes=1,	hh_lite	0.73	dummy	0	1	0.73	dummy	0	1
household head's years. of education	hh_edu	5.90	4.37	0	16	5.90	4.37	0	16
Household's cash inflow									
number of fulltime employed household members.	fulltime_e~o	1.46	0.87	0	5	1.49	0.86	0	4
remittance received by the household: yes=1. otherwise 0	remittance	0.20	dummy	0	1	0.28	dummy	0	1
Household's Zakat payment (an indicator of household's wealth)									
zakat paid by the household: yes=1, otherwise 0	zu_out	0.10	dummy	0	1	0.30	dummy	0	1
zakat (in PKR.) paid by the household	annl_zu_out	387.87	1698.50	0	25000	0.82	2.03	0	25
Household's annual consumption expenditure including the imputed value of in-kind transactions									
total expenditure (in PKR. 000's)	tot_exp	229.93	124.70	28	1357	185.98	102.46	23	983
food expenditure (in PKR. 000's)	exp_fd	163.11	75.21	21	649	124.91	66.57	18	574
non-food expenditure (in PKR. 000's)	exp_nonfood	66.82	64.87	3	763	61.06	46.41	5	509
total expenditure per capita (in PKR.	exp_pc	39.70	17.07	12	143	31.61	14.78	4	150
food expenditure per adult equivalent (in PKR. 000's)*	food_pae	36.91	13.97	11	110	27.26	12.20	4	77
Household's Credit Access									
credit obtained by the household; yes=1, otherwise 0	cr_hh	0.20	dummy	0	1	0.05	dummy	0	1
Women's mobility									
Women of the household are allowed to move freely within the village: yes=1,	wmiv	0.57	dummy	0	1	0.68	dummy	0	1

Note: 1. a balanced panel of 569 households is used for summary statistics and for the rest of analysis in Chapter 5. 2. The table is prepared by the author.

* The adult equivalent units we used are: 0.25 for infants (age<=5), 0.5 for children (age>5 & age<=14), 0.8 for teenagers. (age>14 & age<=18), 0.9 for female adults (age>18 & age<=60), 1.0 for male adults (age>18 & age<=60), and 0.8 for the elderly (age>60).

Table. 5.1
Summary statistics of household-level variables

Description	Variable	Baseline Survey Mean	Std. Dev.	Min	Max	Follow-up Survey Mean	Std. Dev.	Min	Max
Susceptibility to natural disasters and shocks									
The household was affected by 2010 floods	fldaffecte~h	0.38	dummy	0	1				
The household suffered damages due to attacks by wild boars.	wildboar_a~k	0.35	dummy	0	1	0.32	dummy	0	1
estimated crop-loss due to wild boar attacks (WBA) in PKR. 000's	estloss_wba	2.74	5.52	0	50	2.12	6.27	0	100
household eligible to receive randomized treatment to withstand WBA	eligibilit~t					0.35	dummy	0	1
household treated against WBA	t_hh_wtc					0.10	dummy	0	1
Vulnerability - social, economic and physical									
female headed household: yes=1, otherwise 0	fem_hh	0.09	dummy	0	1				
household headed or supported by a pensioner: yes=1, otherwise 0	pensioner_hh	0.16	dummy	0	1				
daily wager headed household: yes=1, otherwise 0	daily_wage	0.34	dummy	0	1				
the households that is either headed by a disabled or depends on instable source of income like Zakat: yes=1, otherwise 0	most_vulne	0.11	dummy	0	1				

Note: 1. A balanced panel of 569 households is used for summary statistics and for the rest of analysis in Chapter 5. 2. The table is prepared by the author.

Table 5.2

Mean comparison of welfare indicators, using the benchmark data

Variable	Mean for each group: (T) CO member household (n=248)	(C_1) Non-member household in CO villages (n=233)	(C_2) Household in non-CO villages (n=88)	Difference (T)-(C_1): Mean		Difference (T)-(C_2): Mean	
Household's annual consumption expenditure including the imputed value of in-kind transactions							
tot_exp	224.75	215.83	281.86	8.93	(10.80)	-57.11 ***	(17.16)
exp_nonfood	66.04	59.32	88.86	6.72	(5.24)	-22.81 *	(10.57)
exp_fd	158.71	156.51	193.01	2.20	(6.68)	-34.30 ***	(9.66)
exp_pc	39.05	37.85	46.40	1.20	(1.47)	-7.35 ***	(2.40)
food_pae	36.26	35.86	41.50	0.41	(1.23)	-5.24 ***	(1.88)
Household's Credit Access							
cr_hh	0.169	0.180	0.364	-0.011	(0.035)	-0.194 ***	(0.057)
Women's mobility							
wmiv	0.690	0.485	0.466	0.205 ***	(0.044)	0.224 ***	(0.061)
Household's Zakat payment (an indicator of household's wealth)							
zu_out	0.13	0.06	0.14	0.06 *	(0.03)	-0.01	(0.04)
annl_zu_out	430.65	351.93	362.50	78.71	(165.22)	68.15	(147.28)

Notes: 1. The standard errors are reported in parenthesis, estimated under the assumption that allow unequal variance of two groups. 2. A subset of 569 of 583 households from benchmark household survey (Survey # 3) has been used for the analysis. 3. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. 4. The table is prepared by the author.

Table 5.3

Mean comparison of welfare indicators, using the resurvey data

Variable	Mean for each group: (T) CO member household (n=249)	(C_1) Non-member household in CO villages (n=232)	(C_2) Household in non-CO villages (n=88)	Difference (T)-(C_1): Mean		Difference (T)-(C_2): Mean	
Household's annual consumption expenditure including the imputed value of in-kind transactions							
tot_exp	188.61	171.09	217.77	17.52	(9.17)	-29.157 *	(12.98)
exp_nonfood	66.02	55.45	61.85	10.56 *	(4.26)	4.170	(5.53)
exp_fd	122.59	115.64	155.92	6.95	(5.73)	-33.33 ***	(9.18)
exp_pc	31.42	30.13	36.04	1.29	(1.33)	-4.62 *	(1.88)
food_pae	26.58	26.15	32.10	0.43	(1.10)	-5.52 ***	(1.50)
Household's Credit Access							
cr_hh	0.048	0.030	0.080	0.018	(0.018)	-0.03	(0.03)
Women's mobility							
wmiv	0.835	0.586	0.477	0.249 ***	(0.040)	0.36 ***	(0.06)
Household's Zakat payment (an indicator of household's wealth)							
zu_out	0.43	0.21	0.20	0.22 ***	(0.04)	0.22 ***	(0.05)
annl_zu_out	1053.80	738.79	393.18	315.00	(199.16)	660.61 ***	(152.16)

Notes: 1. The standard errors are reported in parenthesis, estimated under the assumption that allow unequal variance of two groups. 2. A subset of 569 of 583 households from household resurvey data (Survey # 5) has been used for the analysis. The household represent those which were successfully resurveyed in the follow-up survey. All the observations pertaining to replacement households were dropped. 3." *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$". 4. The table is prepared by the author.

Table 5.4 (A)

Correlates of benchmark household welfare using benchmark household survey

	Dependent variable:				
	Model 1 tot_exp	Model 2 exp_fd	Model 3 exp_nonfood	Model 4 exp_pc	Model 5 food_pae
Variables	b/se	b/se	b/se	b/se	b/se
No PHKN treatment					
dummy for C_1	-1.602	2.638	-4.24	-1.218	-0.134
	(4.865)	(2.948)	(3.506)	(1.057)	(0.925)
dummy for C_2	46.784*	28.018**	18.766	7.886*	6.090*
	(18.498)	(9.012)	(12.557)	(3.013)	(2.316)
Household demographic and asset characteristics					
hhsize	21.525***	14.331***	7.194***	-3.032***	-1.809***
	(1.745)	(1.184)	(0.906)	(0.348)	(0.251)
fem_hh	-22.994	-16.940*	-6.053	0.254	0.755
	(11.383)	(7.815)	(5.474)	(2.244)	(2.045)
hh_edu	3.317**	1.578*	1.739**	0.604***	0.456**
	(1.104)	(0.656)	(0.633)	(0.158)	(0.147)
hh_age	0.796**	0.408**	0.388*	0.137**	-0.008
	(0.268)	(0.149)	(0.179)	(0.049)	(0.037)
h_floor	27.019	12.146	14.874	2.771	3.018
	(17.278)	(7.995)	(10.650)	(2.675)	(1.858)
drainge	8.508	3.36	5.149	1.008	-0.036
	(11.361)	(5.917)	(6.971)	(1.585)	(1.095)
land_val	1.616	0.686	0.93	0.287	-0.165
	(5.469)	(3.119)	(2.615)	(0.718)	(0.429)
livestock_val	0.001	0	0	0	0
	0.000	0.000	0.000	0.000	0.000
Income flow					
fulltime_ehhm_no	8.178*	7.667**	0.510	0.964	-1.948**
	-3.846	-2.741	-2.38	-0.664	-0.635
remittance	47.755***	30.324***	17.431*	7.462***	5.232**
	-11.675	-6.958	-6.698	-1.942	-1.492
Susceptibility to natural disasters and shocks					
fldaffected_hh	-12.146	-1.569	-10.577	-2.385	-1.075
	(9.745)	(5.776)	(6.607)	(1.662)	(1.412)
wildboar_a~k	12.428	5.471	6.957	1.922	1.09
	(9.974)	(5.563)	(6.419)	(1.920)	(1.631)
Intercept	-4.153	15.341	-19.494*	42.933***	45.839***
	(23.669)	(16.143)	(9.436)	(4.628)	(3.777)
R-squared	0.511	0.562	0.271	0.239	0.208
F-statistics	34.338	52.073	15.559	39.915	31.442
Level of Significance	0.000	0.000	0.000	0.000	0.000
Number of Obs.	569	569	569	569	569

Notes: 1. The number of observations is 556 households belonging to Survey # 3, all of which were successfully resurveyed in the follow up survey and hence are the part a balanced panel of 556 households to be used for analysis in this chapter. 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. "* p<0.1, ** p<0.05, *** p<0.01". 4. The table is prepared by the author.

Table 5.4 (B)

Correlates of benchmark household welfare using benchmark household survey

	Dependent variable:			
	Model 1	Model 2	Model 3	Model 4
	rah	wimp	zu_out	annl_zu_out
Variables	b/se	b/se	b/se	b/se
No PHKN treatment				
dummy for C_1	0.026	-0.190***	-0.048*	-36.074
	(0.037)	(0.025)	(0.020)	(55.557)
dummy for C_2	0.213**	-0.220*	-0.005	-189.005
	(0.075)	(0.084)	(0.036)	(171.665)
Household demographic and asset characteristics				
hhsize	0.021**	-0.001	0.003	42.771
	(0.008)	(0.008)	(0.005)	(44.235)
fem_hh	-0.017	0.077	0.038	48.506
	(0.064)	(0.094)	(0.036)	(195.920)
hh_edu	-0.004	0.012*	0.005	13.089
	(0.004)	(0.006)	(0.003)	(23.080)
hh_age	-0.001	-0.001	0	-4.045
	(0.001)	(0.002)	(0.001)	(4.557)
h_floor	-0.03	-0.130*	0.047	706.94
	(0.043)	(0.048)	(0.041)	(365.929)
drainge	-0.034	0.045	0.011	160.402
	(0.035)	(0.040)	(0.027)	(200.880)
land_val	-0.011	0.002	0.014	31.694
	(0.022)	(0.018)	(0.011)	(96.966)
livestock_val	0	0	0	0.008
	0.000	0.000	0.000	(0.011)
Income flow				
fulltime_ehhm_no	(0.005)	(0.021)	0.029	175.52
	-0.018	-0.023	(0.016)	(106.535)
remittance	(0.044)	0.075	0.335***	1214.932***
	-0.039	-0.058	(0.037)	(250.169)
Susceptibility to natural disasters and shocks				
fldaffected_hh	0.082	0.024	-0.052*	-245.381*
	(0.042)	(0.036)	(0.022)	(109.342)
wildboar_a~k	0.073	0.041	0.033	-8.903
	(0.057)	(0.049)	(0.027)	(135.688)
Intercept	0.098	0.634***	-0.042	-407.824
	(0.098)	(0.148)	(0.052)	(239.673)
R-squared	0.088	0.070	0.295	0.222
F-statistics	4.468	13.512	24.506	11.127
Level of Significance	0.000	0.000	0.000	0.000
Number of Obs.	569	569	569	569

Notes: 1. The number of observations is 556 households belonging to Survey # 3, all of which were successfully resurveyed in the follow up survey and hence are the part a balanced panel of 556 households to be used for analysis in this chapter. 2. Dependent variables in Model 1 and Model 2 are credit access and women mobility, respectively. 3. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 4. "* p <0.1, ** p <0.05, *** p <0.01". 5. The table is prepared by the author.

Table 5.5 (A)
Correlates of resurvey household welfare based on household resurvey data

	Dependent variable:				
	Model 1	Model 2	Model 3	Model 4	Model 5
	tot_exp	exp_fd	exp_nonfood	exp_pc	food_pae
Variables	b/se	b/se	b/se	b/se	b/se
No PHKN treatment					
dummy for C_1	-8.790	-1.583	-7.207*	-1.286	-0.233
	(6.442)	(4.104)	(3.525)	(1.232)	(1.199)
dummy for C_2	23.513	30.614**	-7.101	5.208	6.123*
	(14.833)	(9.912)	(7.408)	(2.623)	(2.268)
Household demographic and asset characteristics					
hhsize	17.563***	12.041***	5.521***	-2.373***	-1.281***
	(1.841)	(1.257)	(0.830)	(0.268)	(0.223)
fem_hh	-19.077*	-10.41	-8.667*	-0.536	0.983
	(7.827)	(5.928)	(3.687)	(1.806)	(1.726)
hh_edu	3.136***	1.414*	1.722***	0.491***	0.284*
	(0.713)	(0.577)	(0.273)	(0.137)	(0.135)
hh_age	0.248	-0.028	0.276**	0.048	-0.060*
	(0.174)	(0.119)	(0.102)	(0.028)	(0.025)
h_floor	5.598	-0.264	5.862	0.909	0.763
	(11.203)	(6.845)	(6.767)	(1.954)	(1.260)
drainge	8.997	3.799	5.198	0.272	-0.375
	(8.926)	(5.141)	(5.000)	(1.244)	(0.965)
land_val	4.566	1.399	3.167*	0.654	0.161
	(3.960)	(2.716)	(1.446)	(0.607)	(0.481)
livestock_val	0.000**	0.000*	0.000*	0.000**	0.000*
	0.000	0.000	0.000	0.000	0.000
Income flow					
fulltime_ehhm_no	4.584	3.818	0.766	0.535	-1.478**
	(5.019)	(3.037)	(2.565)	(0.547)	(0.426)
remittance	7.986	1.207	6.779	1.771	-0.076
	(7.880)	(3.899)	(5.060)	(1.522)	(0.856)
Susceptibility to natural disasters and shocks					
fldaffected_hh	2.635	0.88	1.755	0.788	0.39
	(8.674)	(4.770)	(4.707)	(1.536)	(1.239)
wildboar_a~k	16.482	17.744*	-1.262	3.701	4.338*
	(13.046)	(8.010)	(6.330)	(2.296)	(1.925)
Intercept	14.021	19.069	-5.047	36.382***	35.531***
	(18.607)	(12.315)	(8.633)	(3.799)	(3.293)
R-squared	0.440	0.464	0.277	0.218	0.208
F-statistics	31.180	40.411	24.200	20.741	28.606
Level of Significance	0.000	0.000	0.000	0.000	0.000
Number of Obs.	569	569	569	569	569

Notes: 1. The number of observations is 556 pertaining to the household resurvey (Survey # 5), i.e. all of those households that were successfully resurveyed in the follow up survey and hence constitute a balanced panel of 556 households. 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. * p <0.1, ** p <0.05, *** p <0.01

Table 5.5 (B)

Correlates of resurvey household welfare based on household resurvey data

	Model 1	Model 2	Model 3	Model 4
	cr_hh	wmiv	zu_out	annl_zu_out
Variables	b/se	b/se	b/se	b/se
No PHKN treatment				
dummy for C_1	-0.020	-0.243***	-0.205**	-256.356
	(0.022)	(0.031)	(0.064)	(190.991)
dummy for C_2	0.046	-0.359***	-0.213**	-818.414***
	(0.035)	(0.078)	(0.073)	(188.222)
Household demographic and asset characteristics				
hhsize	-0.002	0.007	-0.007	12.028
	(0.003)	(0.006)	(0.005)	(35.349)
fem_hh	0.013	0.12	-0.082	-89.03
	(0.036)	(0.089)	(0.041)	(181.747)
hh_edu	0.001	0.007	-0.001	6.134
	(0.002)	(0.005)	(0.005)	(31.528)
hh_age	0.001	-0.001	0	9.835
	(0.001)	(0.002)	(0.001)	(5.939)
h_floor	-0.001	-0.07	0.01	509.48
	(0.028)	(0.057)	(0.050)	(422.346)
drainge	-0.022	0.002	-0.004	206.42
	(0.018)	(0.048)	(0.035)	(149.566)
land_val	-0.009*	0.009	0.04	270.653*
	(0.004)	(0.016)	(0.023)	(124.325)
livestock_val	0.000	0.000	0	0
	0.000	0.000	0.000	(0.002)
Income flow				
fulltime_ehhm_no	0.003	-0.039	0.055**	348.547*
	(0.009)	(0.021)	(0.016)	(137.074)
remittance	0.018	-0.004	0.202***	607.227***
	(0.031)	(0.032)	(0.052)	(131.401)
Susceptibility to natural disasters and shocks				
fldaffected_hh	-0.005	0.003	-0.023	40.021
	(0.017)	(0.040)	(0.033)	(139.452)
wildboar_a~k	0.005	0.022	0.255***	451.226*
	(0.017)	(0.042)	(0.035)	(218.272)
Intercept	0	0.821***	0.234	-781.102*
	(0.048)	(0.106)	(0.120)	(370.919)
R-squared	0.021	0.109	0.270	0.199
F-statistics	1.072	16.201	26.405	5.988
Level of Significance	0.409	0.000	0.000	0.000
Number of Obs.	569	569	569	569

Notes: 1. The number of observations is 556 pertaining to the household resurvey (Survey # 5), i.e. all of those households that were successfully resurveyed in the follow up survey and hence constitute a balanced panel of 556 households. 2. Dependent variables in Model 1 and Model 2 are credit access and women mobility, respectively. 3. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 4. "* p<0.1, ** p<0.05, *** p<0.01". 5. The table is prepared by the author.

Table 5.6 (A)

Correlates of resurvey household welfare based on benchmark household data

	Dependent variable:				
	Model 1	Model 2	Model 3	Model 4	Model 5
	tot_exp11	exp_fd11	exp_nonfo~11	exp_pc11	food_pae11
Variables	b/se	b/se	b/se	b/se	b/se
No PHKN treatment					
dummy for C_1	-8.010	-1.230	-6.780	-1.216	-0.249
	(7.093)	(4.647)	(3.681)	(1.291)	(1.334)
dummy for C_2	16.778	27.666*	-10.888	4.318	5.690*
	(16.983)	(11.489)	(7.678)	(3.061)	(2.599)
Household demographic and asset characteristics					
l_hhsize	19.352***	12.906***	6.447***	-2.037***	-1.094***
	(2.087)	(1.352)	(0.928)	(0.360)	(0.307)
l_fem_hh	-20.438	-11.354	-9.083	-1.329	0.058
	(11.740)	(7.624)	(5.192)	(2.253)	(1.947)
l_hh_edu	4.184***	2.147***	2.038***	0.669***	0.430**
	(0.707)	(0.547)	(0.304)	(0.142)	(0.137)
l_hh_age	0.642*	0.233	0.409***	0.101**	-0.019
	(0.241)	(0.172)	(0.107)	(0.033)	(0.030)
l_h_floor	-3.832	-7.75	3.918	-0.69	-0.887
	(12.461)	(6.940)	(7.523)	(2.115)	(1.385)
l_drainge	7.626	2.965	4.662	-0.007	-0.573
	(9.425)	(5.230)	(5.236)	(1.357)	(0.990)
l_lan_val	6.473	2.233	4.240*	1.007	0.393
	(3.697)	(2.067)	(1.867)	(0.612)	(0.329)
l_livestoc~l	0	0	0	0	0
	0.000	0.000	0.000	0.000	0.000
Income flow					
l_fulltime~o	7.550	6.007	1.543	0.535	-1.416*
	(5.658)	(3.781)	(2.318)	(0.776)	(0.664)
l_remittance	-10.436	-5.372	-5.064	-1.24	-1.137
	(9.266)	(5.833)	(4.231)	(1.816)	(1.366)
Susceptibility to natural disasters and shocks					
l_fldaffec~h	7.113	4.259	2.854	1.544	1.246
	(12.255)	(6.876)	(6.017)	(2.107)	(1.639)
l_wildboar~k	-9.803	-2.79	-7.012	-1.895	-0.962
	(9.430)	(6.583)	(3.647)	(1.726)	(1.466)
Intercept	-2.44	8.276	-10.716	34.177***	34.017***
	(20.609)	(14.151)	(8.797)	(3.915)	(3.684)
R-squared	0.398	0.411	0.257	0.171	0.158
F-statistics	31.587	36.509	21.101	12.461	18.804
Level of Significance	0.000	0.000	0.000	0.000	0.000
Number of Obs.	569	569	569	569	569

Notes: 1. Analysis are based on a balanced panel of 556 households. 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. Dependent Variables belong to the household resurvey while explanatory variables are lagged variables of household welfare from the benchmark survey. 4. "* p <0.1, ** p <0.05, *** p <0.01". 5. The table is prepared by the author.

Table 5.6 (B)
Correlates of resurvey household welfare based on benchmark household da

	Dependent variable:			
	Model 1	Model 2	Model 3	Model 4
	cr_hh11	wmiv11	zu_out11	annl_zu_o~11
Variables	b/se	b/se	b/se	b/se
No PHKN treatment				
dummy for C_1	-0.022	-0.246***	-0.200**	-230.053
	(0.021)	(0.032)	(0.065)	(200.610)
dummy for C_2	0.053	-0.356***	-0.239***	-879.445***
	(0.035)	(0.078)	(0.067)	(211.747)
Household demographic and asset characteristics				
l_hhsize	-0.006	0.007	0.008	36.504
	(0.004)	(0.007)	(0.005)	(34.576)
l_fem_hh	0.017	0.103	-0.077	-52.811
	(0.036)	(0.093)	(0.055)	(185.401)
l_hh_edu	0.001	0.007	0.005	22.958
	(0.002)	(0.006)	(0.004)	(34.117)
l_hh_age	0.001	0	0.002	17.205*
	(0.001)	(0.001)	(0.002)	(7.783)
l_h_floor	0.007	-0.1	0.006	576.958
	(0.030)	(0.062)	(0.072)	(541.008)
l_drainge	-0.037*	0.012	0	223.557
	(0.016)	(0.048)	(0.046)	(183.391)
l_lan_val	-0.011	0.001	0.048	232.946
	(0.006)	(0.015)	(0.035)	(151.750)
l_livestoc~l	0	0	0.000**	0.002
	0.000	0.000	0.000	(0.001)
Income flow				
l_fulltime~o	0.015	-0.036	0.052*	366.896*
	(0.012)	(0.023)	(0.025)	(138.256)
l_remittance	0.018	-0.002	-0.005	-68.441
	(0.019)	(0.035)	(0.038)	(126.611)
Susceptibility to natural disasters and shocks				
l_fldaffec~h	-0.011	0.007	-0.028	-5.976
	(0.016)	(0.037)	(0.040)	(182.967)
l_wildboar~k	0.02	-0.007	0.173**	458.55
	(0.019)	(0.050)	(0.053)	(330.901)
Intercept	-0.004	0.834***	0.066	-1220.998*
	(0.048)	(0.103)	(0.134)	(460.010)
R-squared	0.030	0.108	0.191	0.159
F-statistics	1.651	14.278	28.907	8.506
Level of Significance	0.107	0.000	0.000	0.000
Number of Obs.	569	569	569	569

Notes: 1. Analysis are based on a balanced panel of 556 households. 2. Dependent variables in Model 1 and Model 2 are credit access and women mobility, respectively. 3. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 4."* p<0.1, ** p<0.05, *** p<0.01". 5. The table is prepared by the author.

Table. 5.7 (A)

Difference-in-Difference (DID) in welfare indicators

	T-C1				T-C2				
Variables (First Difference)	Mean (T)	Mean (C1)	Diff	Se	Mean (T)	Mean (C2)	Diff		Se
Household's annual consumption expenditure including the imputed value of in-kind transactions									
d_tot_exp	-37.72	-43.00	5.28	(8.89)	-37.72	-64.10	26.38	*	(13.03)
d_exp_nonfood	-0.37	-3.47	3.09	(5.05)	-0.37	-27.01	26.64	**	(9.96)
d_exp_fd	-37.35	-39.54	2.19	(5.48)	-37.35	-37.09	-0.26		(7.03)
d_exp_pc	-7.56	-7.79	0.23	(1.42)	-7.56	-10.36	2.80		(2.06)
d_food_pae	-9.72	-9.67	-0.06	(1.15)	-9.72	-9.40	-0.32		(1.57)
Household's Credit Access									
d_cr_hh	-0.12	-0.16	0.04	(0.04)	-0.12	-0.28	0.17	*	(0.07)
Women's mobility									
d_wmiv	0.15	0.09	0.06	(0.04)	0.15	0.01	0.14	***	(0.04)
Household's Zakat payment (an indicator of household's wealtl									
d_zu_out	0.30	0.14	0.16 ***	(0.04)	0.30	0.07	0.23	***	(0.05)
d_annl_zu_out	607.64	404.72	202.92	(0.26)	607.64	30.68	576.96	***	(161.50)

Data: a balanced panel of 569 households distributed across T, C1 and C2
T= member household
C1= non-member household in CO villag
C2= non-member household in non-CO village
Standard errors in parentheses
*p<0.05, **p<0.01, ***p<0.001
The table is prepared by the author.

Table 5.7 (B)

Difference-in-Difference (DID) in intermediate variables

	T-C1					T-C2				
Variables (First Difference)	Mean (T)	Mean (C1)	Diff		Se	Mean (T)	Mean (C2)	Diff		Se
Household asset indicators										
d_h_cond	0.02	0.01	0.01		(0.01)	0.02	0.00	0.02	*	(0.01)
d_h_floor	0.02	0.01	0.01		(0.01)	0.02	0.00	0.02	*	(0.01)
d_drainge	0.01	0.01	0.00		(0.01)	0.01	0.00	0.01		(0.01)
d_area_hh	0.01	0.00	0.01		(0.01)	0.01	0.00	0.01		(0.01)
d_room_no	0.06	-0.01	0.07	*	(0.03)	0.06	-0.01	0.07	*	(0.03)
d_toilet	-0.02	-0.01	-0.01		(0.01)	-0.02	-0.01	-0.01		(0.01)
d_tv	0.01	0.00	0.01		(0.01)	0.01	0.00	0.01		(0.01)
d_telephone	0.01	0.00	0.01		(0.01)	0.01	0.00	0.01		(0.01)
d_cellphone	0.00	0.02	-0.01		(0.01)	0.00	0.01	-0.01		(0.01)
d_internet	0.01	0.00	0.01		(0.01)	0.01	0.00	0.01		(0.01)
d_cab_tv	0.00	0.00	0.00		(0.01)	0.00	-0.02	0.02		(0.02)
d_radio	0.00	0.00	0.00		(0.00)	0.00	0.00	0.00		(0.00)
d_tot_area_ol	0.51	0.42	0.10		(0.49)	0.51	0.00	0.51		(0.30)
d_lan_val	0.18	0.24	-0.06		(0.10)	0.18	0.06	0.13		(0.07)
d_livestck_value	0.03	0.04	-0.01		(0.01)	0.03	0.03	0.01		(0.01)
Demography										
d_hhsize	0.13	0.13	0.01		(0.03)	0.13	0.09	0.04		(0.04)
d_fem_rate	0.01	0.06	-0.05	**	(0.02)	0.01	0.03	-0.02		(0.02)
d_hh_age	0.99	0.99	0.00		(0.01)	0.99	0.99	0.00		(0.01)
Household's Income flow										
d_fulltime_ehhm_r	0.02	0.05	-0.04		(0.05)	0.02	0.00	0.02		(0.05)
d_remittance	0.10	0.10	0.00		(0.04)	0.10	-0.03	0.13	***	(0.04)
Miscellaneous										
d_val_egg	247.00	201.03	45.97		(146.25)	247.00	-129.55	376.55	***	(121.99)

Data: a balanced panel of 569 households distributed across T, C1 and C2
T= member household
C1= non-member household in CO village
C2= non-member household in non-CO village
Standard errors in parentheses
*p<0.05, **p<0.01, ***p<0.001
The table is prepared by the author.

Table 5.8 (A)
DID with additional controls: consumption based welfare analysis

	(1)	(2)	(3)	(4)	(5)
	Dependent Variable (first difference):				
	d_tot_exp	d_exp_nonf~d	d_exp_fd	d_exp_pc	d_food_pae
Variables (lagged)	b/se	b/se	b/se	b/se	b/se
No PHKN treatment					
d_c1	-4.384	-2.550	-1.834	0.365	0.456
	(7.744)	(3.953)	(5.758)	(1.551)	(1.482)
d_c2	-14.006	-21.312*	7.306	-1.173	1.212
	(17.410)	(9.491)	(11.121)	(3.102)	(2.693)
Household demographic and asset characteristics					
l_hhsize	-3.492	-1.22	-2.272	0.837	0.596
	(2.199)	(0.779)	(1.647)	(0.445)	(0.368)
l_fem_hh	-3.557	-4.844	1.287	-2.343	-1.433
	(11.768)	(6.518)	(6.800)	(2.131)	(1.676)
l_hh_edu	0.053	0.09	-0.037	-0.018	-0.116
	(1.003)	(0.471)	(0.652)	(0.135)	(0.134)
l_hh_age	-0.369	-0.066	-0.304	-0.065	-0.031
	(0.316)	(0.217)	(0.173)	(0.055)	(0.033)
l_h_boundry	-7.906	-19.347**	11.441	-0.21	3.205
	(11.335)	(6.369)	(9.895)	(1.483)	(1.749)
l_drainge	-3.681	0.15	-3.832	-1.108	-1.107
	(9.060)	(6.677)	(4.901)	(1.222)	(0.971)
l_gas	-24.687	-12.647	-12.041	-3.014	-1.975
	(26.020)	(21.616)	(9.070)	(3.761)	(2.362)
l_electy	-24.485	-3.711	-20.774	-17.72	-11.384
	(27.248)	(11.200)	(21.097)	(10.193)	(9.379)
l_internet	-73.852	-9.559	-64.293	-14.532	-13.031
	(62.677)	(27.976)	(37.749)	(12.624)	(12.112)
l_cab_tv	-115.017*	-65.413*	-49.603	-23.878**	-15.296*
	(48.883)	(25.120)	(24.927)	(7.018)	(6.993)
l_lan_val	3.464	3.179	0.285	0.44	0.253
	(5.063)	(2.408)	(3.254)	(0.660)	(0.543)
l_livestck~e	-545.52	-321.881	-223.64	-39.786	-24.7
	(509.731)	(298.647)	(223.195)	(43.568)	(25.747)
Income flow					
l_fulltime~o	-5.98	-0.915	-5.065	-1.344	-0.107
	(6.514)	(3.526)	(3.999)	(0.882)	(0.625)
l_remittance	-8.859	-1.648	-7.211	-0.609	-1.008
	(9.717)	(5.585)	(6.765)	(1.683)	(1.522)
Susceptibility to natural disasters and shocks					
l_fldaffec~h	25.220*	15.716	9.505	4.789**	3.041**
	(11.192)	(8.137)	(5.275)	(1.678)	(0.983)
l_wildboar~k	-26.257*	-16.550*	-9.708	-4.508*	-2.345
	(11.275)	(7.321)	(6.210)	(1.746)	(1.215)
Constant	53.017	36.647**	16.37	11.206	-1.899
	(27.527)	(13.545)	(20.796)	(9.958)	(9.100)
R-squared	0.124	0.098	0.102	0.097	0.072
F-statistics	5.603	4.087	4.254	2.946	4.504
Level of Sig	0.000	0.000	0.000	0.002	0.000
Number of Obs.	569	569	569	569	569

Notes: 1. Analysis are based on a balanced panel of 569 households. 2. Estimated by OLS, with robust standard errors clustered at the village level reported in brackets. 3. Dependent variables are first difference of welfare indicators calculated by using balanced panel of 569 households while explanatory variables are lagged variables of household benchmark survey. 4. "* p <0.1, ** p <0.05, *** p <0.01" . 5. The table is prepared by the author.

Table 5.8 (B)

DID with additional controls: welfare analysis based on credit access and women empowerment

	(1)	(2)
	Dependent Variable (first difference):	
	d_cr_hh	d_wmiv
Variable (lagged)	b/se	b/se
No PHKN treatment		
d_c1	-0.064	-0.070*
	(0.036)	(0.031)
d_c2	-0.287*	-0.145*
	(0.108)	(0.060)
Household demographic and asset characteristics		
l_hhsize	-0.027**	0.007
	(0.008)	(0.008)
l_fem_hh	0.043	0.025
	(0.076)	(0.041)
l_hh_edu	0.006	-0.006
	(0.004)	(0.005)
l_hh_age	0.003*	0
	(0.001)	(0.002)
l_h_boundry	0.026	-0.053
	(0.083)	(0.051)
l_drainge	-0.002	-0.023
	(0.039)	(0.039)
l_gas	0.278*	0.018
	(0.137)	(0.069)
l_electy	-0.001	-0.2
	(0.131)	(0.260)
l_internet	0.257	0.186
	(0.301)	(0.135)
l_cab_tv	-0.25	-0.195
	(0.297)	(0.125)
l_lan_val	-0.001	-0.002
	(0.020)	(0.011)
l_livestck~e	-0.838	0.11
	(1.049)	(0.540)
Income flow		
l_fulltime~o	0.026	-0.024
	(0.021)	(0.019)
l_remittance	-0.022	-0.015
	(0.040)	(0.030)
Susceptibility to natural disasters and shocks		
l_fldaffec~h	-0.099*	-0.01
	(0.043)	(0.035)
l_wildboar~k	-0.04	-0.059
	(0.059)	(0.034)
Constant	-0.104	0.465
	(0.197)	(0.279)
R-squared	0.083	0.039
F-statistics	5.987	9.085
Level of Sig	0.000	0.000
Number of Obs.	569	569

Notes: 1. Analysis are based on a balanced panel of 569 households. 2. Estimated by OLS (i.e., linear probability

Table 5.8 (C)

Welfare analysis based on Zakat payment (dummy) and Zakat payment (amount paid in PKR.)

	(1)	(2)
	Dependent Variable (first difference):	
	d_zu_out	d_annl_zu_~t
Variable (lagged)	b/se	b/se
No PHKN treatment		
d_c1	-0.143	-187.185
	(0.074)	(182.697)
d_c2	-0.275***	-767.011**
	(0.076)	(246.855)
Household demographic and asset characteristics		
l_hhsize	-0.006	-63.955
	(0.007)	(62.635)
l_fem_hh	-0.160*	-311.138
	(0.059)	(196.277)
l_hh_edu	-0.006	-10.087
	(0.005)	(22.720)
l_hh_age	0	15.047
	(0.002)	(8.437)
l_h_boundry	0.092	318.912
	(0.067)	(181.698)
l_drainge	-0.037	-1.215
	(0.057)	(153.871)
l_gas	0.078	211.754
	(0.070)	(245.136)
l_electy	-0.13	-252.082
	(0.137)	(381.732)
l_internet	0.54	1969.561
	(0.358)	(1538.838)
l_cab_tv	-0.528	-1776.411
	(0.328)	(1518.550)
l_lan_val	0.027	126.405
	(0.020)	(89.696)
l_livestck~e	0.995	1652.645
	(1.003)	(2622.312)
Income flow		
l_fulltime~o	-0.009	62.446
	(0.028)	(146.241)
l_remittance	0.052	-1.064***
	(0.037)	(0.233)
Susceptibility to natural disasters and shocks		
l_fldaffec~h	0.058	335.265
	(0.045)	(201.350)
l_wildboar~k	0.129*	349.772
	(0.059)	(308.237)
Constant	0.348	-120.219
	(0.188)	(521.706)
R-squared	0.101	0.069
F-statistics	12.979	9.411
Level of Sig	0.000	0.000
Number of Obs	569	569

Notes: 1. Analysis are based on a balanced panel of 569 households. 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. Dependent variables are first difference of welfare indicators calculated by using balanced panel of 569 households while explanatory variables are lagged variables of household benchmark survey. 4. The results become highly instable once Inverse Mills Ratio (IMR) is added to Model 1 and Model 2. 5. * p<0.1, ** p <0.05, *** p <0.01". 6. The table is prepared by the author.

Appendix Table 5.1

Mean comparison of other household variables using the benchmark data

Variable	Mean for each group			Difference (T)-(C_1)		Difference (T)-(C_2)	
	(T) CO member household (n=248)	(C_1) Non-member household in CO villages (n=233)	(C_2) Household in non-CO villages (n=88)	Mean	(S.E.)	Mean	(S.E.)
Household asset indicators							
area_hh	9.742	9.481	9.540	0.261	(0.561)	0.202	(0.759)
h_floor	0.121	0.090	0.170	0.031	(0.028)	-0.049	(0.045)
h_cond	0.444	0.459	0.511	-0.016	(0.045)	-0.068	(0.062)
h_boundry	0.903	0.884	0.989	0.019	(0.028)	-0.085 ***	(0.022)
room_no	2.867	2.708	2.955	0.159	(0.115)	-0.088	(0.178)
toilet	0.915	0.880	0.989	0.035	(0.028)	-0.073 ***	(0.021)
drainge	0.391	0.365	0.636	0.026	(0.044)	-0.245 ***	(0.060)
tv	0.613	0.665	0.545	-0.052	(0.044)	0.067	(0.062)
telephone	0.137	0.133	0.080	0.004	(0.031)	0.058	(0.036)
cellphone	0.895	0.867	0.864	0.028	(0.030)	0.032	(0.042)
internet	0.000	0.000	0.023	0.000	(0.000)	-0.023	(0.016)
cab_tv	0.008	0.000	0.034	0.008	(0.006)	-0.026	(0.020)
radio	0.331	0.322	0.148	0.009	(0.043)	0.183 ***	(0.048)
gas	0.000	0.004	0.432	-0.004	(0.004)	-0.432 ***	(0.053)
tot_area_ol	6.399	6.195	6.909	0.204	(1.039)	-0.510	(1.419)
lan_val	0.505	0.431	1.270	0.074	(0.086)	-0.765 *	(0.332)
livestck_value	0.015	0.016	0.015	0.000	(0.003)	0.001	(0.004)
Demography							
hhsize	6.19	6.03	6.49	0.16	(0.24)	-0.30	(0.36)
fem_rate	1.12	1.06	1.23	0.07	(0.08)	-0.10	(0.12)
hh_age	49.29	50.11	49.43	-0.82	(1.29)	-0.14	(1.68)
hh_lite	0.76	0.71	0.72	0.05	(0.04)	0.05	(0.06)
hh_edu	6.21	5.55	5.97	0.65	(0.40)	0.24	(0.54)
Household's Income flow							
fulltime_ehhm_no	1.435	1.476	1.489	-0.041	(0.080)	-0.053	(0.105)
remittance	0.210	0.176	0.216	0.034	(0.036)	-0.006	(0.051)
zu_out	0.125	0.064	0.136	0.061 *	(0.027)	-0.011	(0.042)
Susceptibility to natural disasters and shocks							
fldaffected_hh	0.431	0.300	0.420	0.131 ***	(0.044)	0.011	(0.062)

Notes: 1. The standard errors are reported in parenthesis, estimated under the assumption that allow unequal variance of two groups. 2. A subset of 569 of 583 households from benchmark household survey (Survey # 3) has been used for the analysis. 3. "*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$." 4. The table is prepared by the author and is an extended version of Table 5.2.

Appendix Table 5.2

Mean comparison of other household variables using the resurvey data

Variable	Mean for each group			Difference (T)-(C_1)		Difference (T)-(C_2)	
	(T) CO member household (n=249)	(C_1) Non-member household in CO villages (n=232)	(C_2) Household in non-CO villages (n=88)	Mean	(S.E.)	Mean	(S.E.)
Household asset indicators							
area_hh	9.715	9.522	9.540	0.193	(0.561)	0.175	(0.759)
h_floor	0.137	0.099	0.170	0.037	(0.029)	-0.034	(0.046)
h_cond	0.462	0.466	0.511	-0.004	(0.046)	-0.050	(0.062)
h_boundry	0.904	0.884	0.966	0.020	(0.028)	-0.062 *	(0.027)
room_no	2.912	2.707	2.943	0.205	(0.117)	-0.032	(0.179)
toilet	0.892	0.871	0.977	0.021	(0.030)	-0.086 ***	(0.025)
drainge	0.406	0.375	0.636	0.031	(0.045)	-0.231 ***	(0.060)
tv	0.631	0.659	0.545	-0.029	(0.044)	0.085	(0.062)
telephone	0.149	0.138	0.080	0.011	(0.032)	0.069	(0.037)
cellphone	0.896	0.888	0.875	0.008	(0.028)	0.021	(0.040)
internet	0.008	0.000	0.023	0.008	(0.006)	-0.015	(0.017)
cab_tv	0.004	0.000	0.011	0.004	(0.004)	-0.007	(0.012)
radio	0.333	0.323	0.148	0.010	(0.043)	0.186 ***	(0.048)
gas	0.000	0.004	0.432	-0.004	(0.004)	-0.432 ***	(0.053)
tot_area_ol	6.845	6.684	6.909	0.162	(1.028)	-0.064	(1.423)
lan_val	0.682	0.687	1.327	-0.005	(0.132)	-0.645	(0.338)
livestck_valu	0.048	0.054	0.041	-0.005	(0.009)	0.007	(0.010)
Demography							
hhsize	6.373	6.099	6.580	0.27	(0.24)	-0.21	(0.364)
fem_rate	1.137	1.112	1.255	0.03	(0.08)	-0.12	(0.121)
hh_age	50.394	50.983	50.420	-0.59	(1.29)	-0.03	(1.680)
hh_lite	0.767	0.698	0.716	0.07	(0.04)	0.05	(0.055)
hh_edu	6.261	5.478	5.966	0.78 *	(0.40)	0.30	(0.544)
Household's Income flow							
fulltime_ehhr	1.462	1.517	1.489	-0.055	(0.079)	-0.03	(0.105)
remittance	0.309	0.280	0.182	0.029	(0.042)	0.13 *	(0.051)
zu_out	0.426	0.207	0.205	0.219 ***	(0.041)	0.221 ***	(0.053)
Susceptibility to natural disasters and shocks							
fldaffected_hl	0.438	0.297	0.420	0.140 ***	(0.044)	0.02	(0.062)
wildboar_atta	0.345	0.284	0.318	0.061	(0.042)	0.03	(0.058)

Notes: 1. The standard errors are reported in parenthesis, estimated under the assumption that allow unequal variance of two groups. 2. A subset of 569 of 583 households from household resurvey data (Survey # 5) has been used for the analysis. The household represent those which were successfully resurveyed in the follow-up survey. All the observations pertaining to replacement households were dropped. 3. "*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$." 4. The table is prepared by the author and is an extended version of Table 5.3.

Annex 5.1
Attrition Bias

Let's denote the total number of households covered in the household benchmark survey (henceforth called as first round) by n, which is a representative sample from population N. After the household resurvey (henceforth called as second round), n comprises n_1 and n_2, where n_1 represents those households successfully resurveyed (and those who did not change their membership status) and n_2 represents those households attrited in the second round (in the wider sense that it includes households successfully resurveyed but whose membership status was changed).

If a sub-sample of households comprising n_1 is employed for cross-sectional or panel analysis, the analysis might suffer from attrition bias provided the attrition occurs in a non-random manner and the non-randomness occurs across key explanatory variables.

To evaluate the possibility of attrition bias, I use various checks (i.e. statistical tests). First, I compare n_1 and n_2 sample households. If the comparison suggests that n_1 and n_2 households are similar, it is likely that the attrition occurs in a random way. Second, even if the first test suggests some non-randomness, the extent of potential bias may be small. To examine this, I first conduct cross-sectional analysis involving $n_1 + n_2$ for the first round and compare the result with the same involving n_1 only. Third, I estimate the Inverse Mills Ratio (IMR) from a probit model by using a model similar to the one employed for other multivariate analysis. I then add IMR to the model(s) used for major panel analysis, examine the significance of the coefficient on the IMR, and compare regression results of models with and without IMR.

In appendix Table 5.3(A), I show mean comparison between 35 variables representing key attributes of the households belonging to n_1 and n_2. According to the analysis, n_1 and n_2 are similar on the basis of 28 of total 35 attributes, that is, 7 rejections.[97] The rejection rate suggests a weak possibility of attrition bias. Because the attrition occurs mostly in C_2-group households (i.e. 12 of 14 attritted household belong to C_2-group), I repeat the exercise for C_2-group only to check the randomness of attrition among C_2-group. According to appendix Table 5.3 (B), there are only three rejections of the 35 attributes, which is quite close to the safe level of rejections. This finding provides a weak evidence of nonexistence of attrition bias. In order to ascertain the finding, I use further checks in the remainder of the Annex.

[97] The rejection exceeds the safe limit of around 2 rejections (35*0.05=1.75) at 5 percent rejection level.

As the second check, I carry out cross-sectional analysis involving $n_1 + n_2$ for the first round and compare the regression estimates of $n_1 + n_2$ with those pertaining to n_1. I present in appendix Tables 5.4 (A-B) results of the mentioned analyses and find no qualitative differences between regression estimates of $n_1 + n_2$ and those of n_1. Hence, the results are in favor of absence of attrition bias.

As the third check, I add the Inverse Mills Ratio (IMR) to the original model used in Chapter 5. For this check, I regress a dummy variable representing attritted households (which takes value equal to 1 if the household attritted, otherwise 0) on explanatory variables used for the main analysis. According to the result shown in appendix Table 5.5, none of the explanatory variables is significant[98] and the overall F-Statistics are small. This confirms that n_2 households are dropped almost randomly. However, to be on safe side, I re-estimate, the model with IMR calculated from the regression results in the appendix Table 5.5. I repeat all major analyses of Chapter 5 (that is those presented in Tables 5.8 and 5.9) by adding IMR as an explanatory variable. Furthermore, I present in appendix Tables 5.6 (A-C) results of attrition regressions. As per the results, the coefficient on IMR is insignificant throughout the analysis. The co-efficients on all the other variables in attrition regressions presented in appendix Tables 5.6 (A-B) are almost similar to those reported through main Tables 5.8 (A-B), without IMR. However, attrition regression reported in appendix Table 5.6 (C) representing main Table 5.9 is highly instable, probably due to the identification by non-linearity. This might be a typical case of weak identification in the absence of excluded variable[99].

As whole, I can say that the attrition bias is non-existent, as it has been proved the attrition occurred randomly.

[98] Only variable *lan_val* representing value of landholdings by the households is significant at 10 percent level of significance, which can be ignored.

[99] Unfortunately, the data lacks a variable, which can safely be categorized as an excluded variable. In the absence of such a variable, attrition regression might be suffering from weak identification.

Attrition bias checks (1)

Appendix Table 5.3(A)

Mean comparison of attritted (n2) and resurveyed households (n1) using the benchmark data

	Mean for each group		Difference (*n2*)-(*n1*)		
	(*n2*) attritted households (*n* =14)	(n1) Resurveyed households	Mean	(S.E.)	
area_hh	9.071	9.604	-0.532	(1.900)	
h_floor	0.429	0.116	0.313	(0.138)	
h_cond	0.714	0.460	0.254	(0.127)	
h_boundry	1.000	0.909	0.091	(0.012)	***
room_no	3.143	2.815	0.327	(0.470)	
toilet	0.929	0.912	0.016	(0.072)	
drainge	0.857	0.418	0.439	(0.099)	**
elect	0.929	0.995	-0.066	(0.071)	
tv	0.786	0.624	0.162	(0.116)	
telephone	0.214	0.127	0.088	(0.115)	
cellphone	0.857	0.879	-0.022	(0.098)	
internet	0.071	0.004	0.068	(0.071)	
cab_tv	0.214	0.009	0.205	(0.114)	
radio	0.357	0.299	0.058	(0.134)	
gas	0.571	0.069	0.503	(0.138)	**
tot_area_ol	0.000	6.395	-6.395	(0.477)	***
lan_val	0.000	0.593	-0.593	(0.063)	***
livestock_val	0.006	0.016	-0.009	(0.006)	
hhsize	6.500	6.167	0.333	(0.857)	
fem_rate	0.973	1.146	-0.172	(0.201)	
hh_age	52.643	49.650	2.993	(3.621)	
hh_lite	0.714	0.733	-0.019	(0.127)	
hh_edu	6.643	5.902	0.741	(1.252)	
fulltime_ehhm_no	1.786	1.460	0.325	(0.302)	
remittance	0.214	0.197	0.017	(0.115)	
zu_in	0.000	0.033	-0.033	(0.008)	***
zu_out	0.286	0.102	0.184	(0.126)	
tot_exp	334.084	229.929	104.154	(55.863)	
exp_fd	221.376	163.111	58.265	(31.465)	
exp_nonfood	112.707	66.818	45.889	(25.058)	
exp_pc	51.789	39.696	12.092	(3.925)	**
food_pae	43.372	36.907	6.465	(3.039)	
cr_hh	0.286	0.204	0.082	(0.126)	
wmiv	0.500	0.571	-0.071	(0.140)	
fldaffected_hh	0.286	0.376	-0.090	(0.127)	
wildboar_attack	0.000	0.346	-0.346	(0.020)	***

Note: The table is prepared by the author.

Attrition bias checks (1
Appendix Table 5.3(B)

Mean comparison of attritted (n2c2) and resurveyed households (n1c2) in C2 using the benchmark data

	Mean for each group		Difference (*n2c2*)-(*n1c2*)		
	(*n2c2*) attrited households (*n*=12)	(*n1c2*) Resurveyed households (*n*=88)	Mean	(S.E.)	
area_hh	8.833	9.540	-0.706	(2.225)	
h_floor	0.500	0.170	0.330	(0.156)	
h_cond	0.667	0.511	0.155	(0.152)	
h_boundry	1.000	0.989	0.011	(0.011)	
room_no	3.250	2.955	0.295	(0.561)	
toilet	0.917	0.989	-0.072	(0.084)	
drainge	0.833	0.636	0.197	(0.124)	
elect	0.917	0.989	-0.072	(0.084)	
tv	0.750	0.545	0.205	(0.141)	
telephone	0.250	0.080	0.170	(0.134)	
cellphone	0.833	0.864	-0.030	(0.118)	
internet	0.083	0.023	0.061	(0.085)	
cab_tv	0.250	0.034	0.216	(0.132)	
radio	0.417	0.148	0.269	(0.153)	
gas	0.667	0.432	0.235	(0.152)	
lan_val	0.000	1.270	-1.270	(0.325)	***
livestock_val	0.000	0.015	-0.015	(0.003)	***
hhsize	6.667	6.489	0.178	(1.036)	
fem_rate	0.969	1.226	-0.258	(0.248)	
hh_age	54.000	49.432	4.568	(4.238)	
hh_lite	0.667	0.716	-0.049	(0.150)	
hh_edu	6.250	5.966	0.284	(1.491)	
fulltime_ehhm_no	1.833	1.489	0.345	(0.356)	
remittance	0.167	0.216	-0.049	(0.121)	
zu_in	0.000	0.000	0.000	(0.000)	
zu_out	0.250	0.136	0.114	(0.136)	
tot_exp	340.264	281.863	58.401	(66.971)	
exp_fd	225.314	193.006	32.308	(37.566)	
exp_nonfood	114.950	88.857	26.093	(30.763)	
exp_pc	51.350	46.397	4.954	(4.972)	
food_pae	43.098	41.502	1.595	(3.745)	
cr_hh	0.333	0.364	-0.030	(0.151)	
wmiv	0.500	0.466	0.034	(0.160)	
fldaffected_hh	0.250	0.420	-0.170	(0.141)	
wildboar_attack	0.000	0.307	-0.307	(0.049)	***

Note: The table is prepared by the author.

Attrition bias checks (2)

Table 5.4 (A)

Correlates of benchmark household welfare using benchmark household survey

	n1					n1+n2				
	Dependent variable:									
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
	tot_exp	exp_fd	exp_nonfooc	exp_pc	food_pae	tot_exp	exp_fd	exp_nonfooc	exp_pc	food_pae
Variables	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
No PHKN treatment										
dummy for C_1	-1.602	2.638	-4.24	-1.218	-0.134	-1.401	2.608	-4.009	-1.16	-0.077
	(4.865)	(2.948)	(3.506)	(1.057)	(0.925)	(4.900)	(2.988)	(3.470)	(1.057)	(0.933)
dummy for C_2	46.784*	28.018**	18.766	7.886*	6.090*	51.475**	30.505**	20.97	8.331**	6.289**
	(18.498)	(9.012)	(12.557)	(3.013)	(2.316)	(18.923)	(9.140)	(12.304)	(2.991)	(2.189)
Household demographic and asset characteristics										
hhsize	21.525***	14.331***	7.194***	-3.032***	-1.809***	22.189***	14.613***	7.576***	-2.999***	-1.789***
	(1.745)	(1.184)	(0.906)	(0.348)	(0.251)	(1.716)	(1.148)	(0.905)	(0.337)	(0.245)
fem_hh	-22.994	-16.940*	-6.053	0.254	0.755	-21.374	-15.928*	-5.446	0.272	0.838
	(11.383)	(7.815)	(5.474)	(2.244)	(2.045)	(11.466)	(7.775)	(5.550)	(2.251)	(2.041)
hh_edu	3.317**	1.578*	1.739**	0.604***	0.456**	3.370**	1.650*	1.720**	0.592***	0.451**
	(1.104)	(0.656)	(0.633)	(0.158)	(0.147)	(1.102)	(0.646)	(0.635)	(0.154)	(0.141)
hh_age	0.796**	0.408**	0.388*	0.137**	-0.008	0.792**	0.404*	0.387*	0.134**	-0.013
	(0.268)	(0.149)	(0.179)	(0.049)	(0.037)	(0.274)	(0.152)	(0.181)	(0.049)	(0.037)
h_floor	27.019	12.146	14.874	2.771	3.018	35.579	16.742	18.837	3.99	3.922*
	(17.278)	(7.995)	(10.650)	(2.675)	(1.858)	(18.370)	(8.804)	(10.824)	(2.694)	(1.843)
drainge	8.508	3.36	5.149	1.008	-0.036	9.509	4.01	5.499	1.131	0.024
	(11.361)	(5.917)	(6.971)	(1.585)	(1.095)	(11.062)	(5.777)	(6.794)	(1.544)	(1.054)
land_val	1.616	0.686	0.93	0.287	-0.165	0.956	0.324	0.632	0.209	-0.21
	(5.469)	(3.119)	(2.615)	(0.718)	(0.429)	(5.270)	(3.027)	(2.507)	(0.698)	(0.415)
livestock_val	0.001	0	0	0	0	567.042	264.474	302.568	53.044	39.798
	0.000	0.000	0.000	0.000	0.000	(447.871)	(170.876)	(283.258)	(40.901)	(24.260)
Income flow										
fulltime_ehhn	8.178*	7.667**	0.510	0.964	-1.948**	10.338*	8.900**	1.438	1.182	-1.790**
	-3.846	-2.741	-2.38	-0.664	-0.635	-4.383	-2.963	-2.521	-0.686	-0.645
remittance	47.755***	30.324***	17.431*	7.462***	5.232**	46.774***	29.826***	16.948*	7.295***	5.047**
	-11.675	-6.958	-6.698	-1.942	-1.492	-11.96	-7.042	-6.808	-1.926	-1.495
Susceptibility to natural disasters and shocks										
fldaffected_hh	-12.146	-1.569	-10.577	-2.385	-1.075	-13.13	-2.442	-10.688	-2.489	-1.191
	(9.745)	(5.776)	(6.607)	(1.662)	(1.412)	(9.911)	(5.776)	(6.633)	(1.682)	(1.412)
wildboar_a~k	12.428	5.471	6.957	1.922	1.09	11.448	5.053	6.395	1.835	1.079
	(9.974)	(5.563)	(6.419)	(1.920)	(1.631)	(9.919)	(5.477)	(6.447)	(1.922)	(1.627)
Intercept	-4.153	15.341	-19.494*	12.933***	15.839***	-11.405	11.719	-23.124*	12.573***	15.679***
	(23.669)	(16.143)	(9.436)	(4.628)	(3.777)	(23.856)	(16.024)	(9.704)	(4.568)	(3.712)
R-squared	0.511	0.562	0.271	0.239	0.208	0.523	0.573	0.287	0.244	0.212
F-statistics	34.338	52.073	15.559	39.915	31.442	32.530	48.801	16.428	42.031	32.338
Level of Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number of Obs	569	569	569	569	569	583	583	583	583	583

Notes: 1. The number of observations is 569 households belonging to Survey # 3, all of which were successfully resurveyed in the follow up survey and hence are the part a balanced panel of 569 households to be used for analysis in this chapter. 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. " * p<0.1, ** p<0.05, *** p<0.01". 4. The table is prepared by the author.

Notes: 1. The number of observations is 583 households belonging to Survey # 3. 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. " * p<0.1, ** p<0.05, *** p<0.01". 4. The table is prepared by the author.

Attrition bias checks (2)
Appendix Table 5.4 (B)
Correlates of benchmark household welfare using benchmark household survey

	n1		n1+n2	
	Dependent variable:		Dependent variable:	
	Model 1	Model 2	Model 1	Model 2
	cr_hh	wmiv	cr_hh	wmiv
Variables	b/se	b/se	b/se	b/se
No PHKN treatment				
dummy for C_1	0.026	-0.190***	0.027	-0.185***
	(0.037)	(0.025)	(0.037)	(0.025)
dummy for C_2	0.213**	-0.220*	0.216**	-0.207**
	(0.075)	(0.084)	(0.070)	(0.076)
Household demographic and asset characteristics				
hhsize	0.021**	-0.001	0.023**	0.002
	(0.008)	(0.008)	(0.008)	(0.008)
fem_hh	-0.017	0.077	-0.014	0.083
	(0.064)	(0.094)	(0.064)	(0.094)
hh_edu	-0.004	0.012*	-0.004	0.012*
	(0.004)	(0.006)	(0.004)	(0.005)
hh_age	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.002)	(0.001)	(0.002)
h_floor	-0.03	-0.130*	-0.024	-0.115*
	(0.043)	(0.048)	(0.044)	(0.050)
drainge	-0.034	0.045	-0.036	0.045
	(0.035)	(0.040)	(0.035)	(0.041)
land_val	-0.011	0.002	-0.011	0.001
	(0.022)	(0.018)	(0.022)	(0.017)
livestock_val	0	0	0.892	-0.157
	0.000	0.000	(0.982)	(0.859)
Income flow				
fulltime_ehhm_	(0.005)	(0.021)	(0.009)	(0.021)
	-0.018	-0.023	-0.017	-0.024
remittance	(0.044)	0.075	(0.051)	0.059
	-0.039	-0.058	-0.04	-0.058
Susceptibility to natural disasters and shocks				
fldaffected_hh	0.082	0.024	0.087*	0.025
	(0.042)	(0.036)	(0.042)	(0.036)
wildboar_a~k	0.073	0.041	0.072	0.04
	(0.057)	(0.049)	(0.057)	(0.050)
Intercept	0.098	0.634***	0.083	0.624***
	(0.098)	(0.148)	(0.095)	(0.146)
R-squared	0.088	0.070	0.091	0.066
F-statistics	4.468	13.512	5.467	13.241
Level of Sig.	0.000	0.000	0.000	0.000
Number of Obs.	569	569	583	583

Notes: 1. The number of observations is 569 households belonging to Survey # 3, all of which were successfully resurveyed in the follow up survey and hence are the part a balanced panel of 569 households to be used for analysis in this chapter. 2. Dependent variables in Model 1 and Model 2 are credit access and women mobility, respectively. 3. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 4. " * p<0.1, ** p<0.05, ***

Notes: 1. The number of observations is 583 households belonging to Survey # 3. 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. " * p<0.1, ** p<0.05, *** p<0.01". 4. The table is prepared by the author.

Attrition Check 3
Appendix Table 5.5
Correlates of attrition

	(1)
	Dependent Variable
	n2
Explanatory variables	b/se
No PHKN treatment	
d_c1	0.001
	(0.008)
d_c2	0.071
	(0.041)
Household demographic and asset characteristics (lagged variables)	
l_hhsize	-0.001
	(0.003)
l_fem_hh	-0.018
	(0.012)
l_hh_edu	0.001
	(0.001)
l_hh_age	0.001
	0.000
l_h_boundry	0.019
	(0.020)
l_drainge	0.022
	(0.011)
l_gas	0.063
	(0.080)
l_electy	-0.094
	(0.147)
l_internet	-0.127
	(0.293)
l_cab_tv	0.291
	(0.161)
l_lan_val	-0.010*
	(0.005)
l_livestoc~l	0.102
	(0.177)
Income flow (lagged variable	
l_fulltime~c	0.01
	(0.010)
Susceptibility to natural disasters and shocks (lagged variables)	
l_fldaffec~h	0.001
	(0.009)
l_wildboar~k	-0.016
	(0.010)
Intercept	0.032
	(0.125)
R-squared	0.167
F-Statistics	1.354
Level of Sig	0.221
Number of Obs	583

Notes: 1. n2 is a dummy representing the households belonging to Survey # 3 that were not re-surveyed in Survey # 5, due to some reason . 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. " * p<0.1, ** p<0.05, *** p<0.01". 4. The table is prepared by the author.

Attrition Check 3

Appendix Table 5.6 (A)

Difference-in-Difference (DID) with Inverse Mills Ratio: Consumption based welfare analysis

	(1)	(2)	(3)	(4)	(5)
	Dependent Variable (first difference):				
	d_tot_exp	d_exp_fd	d_exp_nonf~d	d_exp_pc	d_food_pae
Explanatory variables	b/se	b/se	b/se	b/se	b/se
No PHKN treatment					
d_c1	-6.825	-3.077	-3.748	0.181	0.278
	(8.627)	(5.728)	(4.726)	(1.577)	(1.431)
d_c2	53.636	45.163	8.473	4.111	7.415
	(65.733)	(31.592)	(39.743)	(6.708)	(5.074)
Household demographic and asset characteristics (lagged variables)					
l_hhsize	-5.756**	-3.330*	-2.426*	0.667	0.456
	(2.077)	(1.453)	(1.041)	(0.456)	(0.366)
l_fem_hh	-19.998	-7.509	-12.49	-3.604	-2.779
	(15.944)	(7.869)	(9.828)	(2.591)	(1.887)
l_hh_edu	1.377	0.663	0.714	0.085	-0.005
	(2.036)	(0.945)	(1.168)	(0.199)	(0.147)
l_hh_age	0.109	-0.042	0.151	-0.027	0.012
	(0.673)	(0.292)	(0.430)	(0.079)	(0.045)
l_h_boundry	-4.974	12.828	-17.801**	0.014	3.437
	(10.729)	(10.032)	(5.751)	(1.471)	(1.738)
l_drainge	12.777	5.046	7.731	0.169	0.31
	(13.460)	(6.921)	(8.727)	(1.794)	(1.165)
l_gas	-17.203	-8.783	-8.42	-2.453	-1.54
	(25.251)	(8.159)	(21.517)	(3.720)	(2.320)
l_electy	-21.446	-19.396	-2.05	-17.512	-11.346
	(25.388)	(19.647)	(10.570)	(10.033)	(9.187)
l_internet	-62.267	-58.682	-3.585	-13.619	-12.128
	(60.719)	(35.274)	(28.231)	(12.202)	(11.612)
l_cab_tv	-118.838*	-50.37	-68.468*	-24.115**	-15.145
	(53.164)	(28.640)	(25.639)	(7.281)	(7.679)
l_lan_val	-6.328	-4.729	-1.599	-0.31	-0.508
	(6.572)	(3.599)	(4.177)	(0.712)	(0.553)
l_livestoc~l	0	0	0	0	0
	0.000	0.000	0.000	0.000	0.000
Income flow (lagged variable)					
l_fulltime~c	-0.629	-1.959	1.33	-0.925	0.401
	(5.105)	(3.661)	(2.817)	(0.911)	(0.660)
Susceptibility to natural disasters and shocks (lagged variables)					
l_fldaffec~h	22.641*	8.355	14.286	4.592**	2.879**
	(10.239)	(4.802)	(7.780)	(1.635)	(0.960)
l_wildboar~k	-45.102	-19.614	-25.488	-5.955*	-3.865*
	(22.341)	(10.084)	(13.351)	(2.427)	(1.483)
Inverse Mills Ratio (IMR)					
imr_l	1002.029	552.793	449.237	78.25	89.959
	(912.314)	(386.337)	(577.464)	(89.252)	(51.605)
Intercept	-775.461	-442.056	-333.405	-53.487	-76.561
	(760.140)	(321.375)	(480.268)	(74.881)	(43.307)
R-squared	0.108	0.094	0.083	0.094	0.072
F-statistics	4.113	4.778	4.908	3.338	5.376
Level of Sig.	0.000	0.000	0.000	0.001	0.000
Number of Obs.	569	569	569	569	569

Notes: 1. Analysis are based on a balanced panel of 569 households. 2. Estimated by OLS, with robust standard errors clustered at the village level reported in brackets. 3. Dependent variables are first difference of welfare indicators calculated by using balanced panel of 569 households while explanatory variables are lagged variables of household benchmark survey. 4. " * p<0.1, ** p<0.05, *** p<0.01". 5. The table is prepared by the author.

Attrition Check 3

Appendix Table 5.6 (B)

Difference-in-Difference (DID) with Inverse Mills Ratio: Welfare analysis based on credit access and women empowermen

	(1)	(2)
	Dependent Variable (first difference):	
	d_cr_hh	d_wmiv
Explanatory variables	b/se	b/se
No PHKN treatment		
d_c1	-0.067	-0.068*
	(0.036)	(0.030)
d_c2	-0.307	-0.237
	(0.180)	(0.131)
Household demographic and asset characteristics (lagged variables)		
l_hhsize	-0.029**	0.008
	(0.008)	(0.008)
l_fem_hh	0.042	0.042
	(0.078)	(0.046)
l_hh_edu	0.006	-0.007
	(0.005)	(0.005)
l_hh_age	0.003	-0.001
	(0.002)	(0.002)
l_h_boundry	0.039	-0.051
	(0.090)	(0.051)
l_drainge	-0.004	-0.044
	(0.050)	(0.044)
l_gas	0.289*	0.015
	(0.132)	(0.068)
l_electy	-0.025	-0.211
	(0.123)	(0.263)
l_internet	0.249	0.165
	(0.305)	(0.140)
l_cab_tv	-0.256	-0.198
	(0.301)	(0.126)
l_lan_val	-0.005	0.008
	(0.022)	(0.014)
l_livestoc~l	0.000**	0
	0.000	0.000
Income flow (lagged variable)		
l_fulltime~c	0.023	-0.032
	(0.023)	(0.022)
Susceptibility to natural disasters and shocks (lagged variables)		
l_fldaffec~h	-0.100*	-0.007
	(0.043)	(0.035)
l_wildboar~k	-0.043	-0.038
	(0.071)	(0.040)
Inverse Mills Ratio (IMR)		
imr_l	-0.371	-1.411
	(1.833)	(1.601)
Intercept	0.195	1.624
	(1.579)	(1.284)
R-squared	0.084	0.040
F-statistics	6.241	10.360
Level of Sig.	0.000	0.000
Number of Obs.	569	569

Notes: 1. Analysis are based on a balanced panel of 569 households. 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. Dependent variables are first difference of welfare indicators calculated by using balanced panel of 569 households while explanatory variables are lagged variables of household benchmark survey. 4. " * p<0.1, ** p<0.05, *** p<0.01". 5. The table is prepared by the author.

Attrition Check 3
Appendix Table 5.6 (C)
Difference-in-Difference (DID) with Inverse Mills Ratio: welfare analysis based on Zakat payment (dummy) and Zakat payment (amount paid in Rs.)

	(1)	(2)
	Dependent Variable (first difference):	
	d_zu_out	d_annl_zu_~t
Variable (lagged)	b/se	b/se
No PHKN treatment		
d_c1	-0.142	-189.709
	(0.072)	(173.586)
d_c2	-0.215	-578.139
	(0.190)	(596.742)
Household demographic and asset characteristics (lagged variables)		
l_hhsize	-0.003	-59.446
	(0.008)	(60.075)
l_fem_hh	-0.163*	-325.084
	(0.063)	(205.927)
l_hh_edu	-0.006	-7.535
	(0.005)	(24.320)
l_hh_age	0.001	16.234
	(0.002)	(10.508)
l_h_boundry	0.1	362.645
	(0.069)	(185.066)
l_drainge	-0.028	33.71
	(0.062)	(245.721)
l_gas	0.074	218.681
	(0.071)	(249.868)
l_electy	-0.162	-385.52
	(0.134)	(400.743)
l_internet	0.543	1984.148
	(0.363)	(1502.645)
l_cab_tv	-0.493	-1675.234
	(0.312)	(1471.799)
l_lan_val	0.025	110.897
	(0.022)	(97.448)
l_livestoc~l	0.000**	0.003
	0.000	(0.001)
Income flow (lagged variable)		
l_fulltime~c	-0.004	71.969
	(0.040)	(174.906)
Susceptibility to natural disasters and shocks (lagged variables)		
l_fldaffec~h	0.06	336.947
	(0.045)	(201.358)
l_wildboar~k	0.125	325.116
	(0.062)	(322.231)
Inverse Mills Ratio (IMR)		
imr_l	0.755	2346.834
	(2.456)	(8969.441)
Intercept	-0.29	-2104.321
	(2.033)	(7605.093)
R-squared	0.113	0.081
F-statistics	9.843	10.549
Level of Sig	0.000	0.000
Number of Obs	569	569

Notes: 1. Analysis are based on a balanced panel of 569 households. 2. Estimated by OLS (i.e., linear probability model when the dependent variable is wmiv), with robust standard errors clustered at the village level reported in brackets. 3. Dependent variables are first difference of welfare indicators calculated by using balanced panel of 569 households while explanatory variables are lagged variables of household benchmark survey. 4. The results obtained by using Zakat as a dependent variable represent a typical case of weak identification. 5. " * $p<0.1$, ** $p<0.05$, *** $p<0.01$". 6. The table is prepared by the author.

Chapter 6: Impact of Human Resource Development in Reducing Vulnerability to Wild Animal Attacks

6.1 Introduction

Agriculture is an economic activity fraught with risk. According to Newbery and Stiglitz (1981), farmers are more concerned about it's the adverse impact of risk on their consumption. The existing literature on agricultural risk mostly focuses on the more well-known risks: crop losses owing to weather extremes (e.g., drought, excess moisture, hail, freezing, and flooding), disease, and pest damage (OECD, 2009; Deng et al., 2007). On the other hand, owing to the increased frequency of human–wildlife conflicts, farmers face the ever-growing risk of wild animal attacks on their crops, and subsequent income losses (Sutton et al, 2008; Else and Lee, 1986; Naughton–Treves, 1998). It is known that crop damage because of wild animal attacks constitutes a stochastic shock.

Wild boars are universally notorious among wild animals that inflict -substanitial crop damages (Tisdell, 1982). According to Chauhan (2009), crop damage because of wild boar attacks (WBAs) has been reported for decades by farmers in the Indian subcontinent.[100] According to the study, the crop damages range from 5% to 36% depending on the state and crop variety. However, the existing literature on WBAs (i.e., Maekin, 1970; Jezierski, 1978; Genov, 1981; Santaipillai and Chambers, 1982; Ahmed and Samant, 1989; Ahmed, 1991; Chauhan, 1993, 1996) mostly comprises technical reports and lacks rigorous analysis; these studies are largely based on general and fragmentary information. These studies also ignore the monetary and welfare aspects of agrarian households that have succumbed to WBAs.[101] In the context of Pakistan, reports of noticeable WBAs have been surfaced in the early 80'sand hence, they have not been extensively investigated—an exception being a study by Shafi and Khokhar (1986), but it is based on mere field observations.

This study is the first attempt to cleanly identify the impact of an HRD intervention called the anti-WBA program (AWBAP). The PHKN implemented the AWBAP, under an RCT design. The objective of the program is to mitigate WBA-related crop-income losses among AWBAP-treated households and hence improve their welfare. However, there is the possibility of elite capture when RCTs are implemented at the village or commune level (Bardhan, 2000; Araujo et al., 2006; Bardhan, 2002; Platteau and Gaspart, 2003; Governance and Social

[100] According to agricultural economists, poor extension services are also contributing to an increase in crop losses owing to WBAs.

[101] For instance, in the Indian states of Rajasthan, Maharashtra, and Madhya Pradesh, crop damages because of WBAs are often reported by farmers.

Development Resource Center, 2011). To overcome this issue, PHKN employed a unique implementation strategy for the AWBAP. Rather than adopting commonly used village or commune-level randomization strategies, the PHKN randomized the treatment at the household level.[102] In this chapter, I use household-level variations in treatment status to identify the impact of the AWBAP.

The study is expected to add a new dimension to the existing literature, owing to its novelty. In this chapter, I assess the impact of the AWBAP on nominal crop-income losses (direct impact) and on the welfare (indirect impact) of the households treated with the AWBAP. For welfare analysis, I use data pertaining to the consumption of the eligible households.

As one chapter of a dissertation that undertakes an economic analysis of CBD interventions, this chapter complements Chapter 5 by providing additional evidence on the impact of CBD intervention; here, the impact is cleanly identified thanks to the use of an RCT design. Another extension of the analysis in this chapter is its examination of whether the impact of the RCT differs between PHKN members and nonmembers.[103]

The rest of this chapter is organized in the following fashion. Section 6.2 provides a detailed overview of WBAs. Section 6.3 describes the data used herein, and Section 6.4 presents the empirical strategy adopted for analysis. Section 6.5 estimates the impact of the AWBAP on income loss owing to WBAs, while Section 6.6 assesses the impact of the AWBAP on household consumption. Section 6.7 presents the results of robustness checks, while Section 6.8 concludes the chapter and proposes policy recommendations.

[102] So far, no local level externality (e.g., shifting of WBAs from one plot to another) and/or proximity related issues have been observed.

[103] Refer to Chapter 3 of the dissertation for further information regarding the attributes of PHKN members and nonmember.

6.2 The Nature of Wild Boar Attacks, and PHKN Experiments

6.2.1 Background

Farmers from Pakistan's southern districts and the Hazara Division of KPK have long reported frequent incidents involving WBAs.[104] The attacks cause immense damage to crops, grasslands, and soil. The damage due to WBAs are short term only, i.e. crop losses.[105] Local agriculture and wildlife experts consider the loss of the wild boars' natural habitat to be the root cause of WBAs. WBAs are at their peak frequency during the summer season, particularly in harvest time. Cereal crops—especially maize and wheat—are vulnerable to WBAs. According to my field observations, over two-thirds of the eligible households[106] grew maize in their plots during the study period.[107] Nothing can be salvaged of a farm's crops once it is attacked by wild boars; the leftover crop cannot even be used as livestock fodder.[108] Since most of the project area is rain-fed, mono-cropped agriculture is in practice.[109] As a result, crop losses owing to WBAs constitute not only a loss of grain for self-consumption and of buffer stock used to manage liquidity crisis, it also represents a loss of livestock fodder for use in the dry seasons. This suggests that crop losses can pose a serious threat to regional and national-level food security.

6.2.2 Descriptions of the intervention and the experimental design

The PHKN has observed news of widespread losses owing to WBAs and carefully reviewed the needs of its CO members (in the form of CO proposals) with respect to remedial action.[110] Given the WBA information collected through the household benchmark survey (Survey #3), the PHKN was able to convince donors and all stakeholders to fund this remedial action.

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[104] The southern districts of KPK include Kohat, Karak, Lakki Marwat, and D.I. Khan, while the Hazara Division comprises the Districts Haripur, Abbottabad, Mansehra, Batagram, and Tor Ghar. District Haripur is the project area of PHKN, where the AWBAP has been implemented.

[105] Long term damage due to WBAs might be the permanent damages to farming plots or grass land that it can no longer be used for productive purposes. This is not the case in the study area.

[106] The households that reported WBAs in the benchmark survey (in 2010) are called "eligible households"—something I will explain in subsection 6.2.3, which examines the experimental design.

[107] Most of the farming plots held by eligible households during the study period were maize crops. The rest of the land was used to grow vegetables for self-consumption.

[108] Livestock refuse to eat the salvaged crop, as they can sense the peculiar odor of boars within it.

[109] Bearing in mind the frequent price-hikes of grains, local farmers are mostly involved in subsistence farming and prefer to produce cereal crops like maize and wheat for self-consumption.

[110] PHKN usually follows a CBD approach in implementing its programs and interventions. With the AWBAP, however, five nonmember households are also randomly treated. This is a very different application approach, as far as PHKN practices are concerned. Therefore, the use of the term "NGO" in this chapter is a reflection of the novel approach adopted by the PHKN in implementing the AWBAP.

Soon after securing the funding, the PHKN—with the help of the district's agriculture and livestock departments—designed a pilot version of the AWBAP.[111] Figure 6.1 is a flowchart that indicates the process by which AWBAP treatment takes places. The main objective of this program was to prevent WBAs and subsequent crop-income losses. The program comprises HRD training that focuses on the awareness and prevention of WBAs. The prevention component of the program imparts information on basic techniques[112] for scaring or trapping animals, and for curtailing boar-population growth.[113] Moreover, under the program, some basic equipment and animal drugs are provided to the treated households, upon successfully completing the training.[114] The average direct cost of AWBAP treatment[115] per household is around PKR 6,000.[116]

According to the benchmark survey, 197 of the 583 households reported WBAs (henceforth referred to as "eligible households") that were spread across 30 villages; these households are spread across the member (*T*-group) and nonmember (C_1-group) households in CO villages, and nonmember (C_2-group) households in non-CO villages. Owing to financial constraints and donor restrictions, PHKN selected 55 of the eligible households randomly using the lucky draw. Distribution of the treated households across *T*-group, C_1-group, and C_2-group is 48, 3, and 4, respectively across 19 villages. In normal situation, CBO approach does not allow non-member to be treated with any of its interventions. The non-members are included in AWBAP as a special case. Therefore, owing to policy and donors' restrictions, the share of treated households

[111] The AWBAP's design is based on information regarding the nature and extent of crop damage because of WBAs, which has been gathered through personal meetings with the local administration of forest and agriculture departments. In this regard, concerned field officers and field assistants have provided valuable first-hand information that is used as input data that drive program implementation.

[112] The techniques comprise indigenous ways of scaring or trapping wild animal herds; these were used in the past, but are no longer in practice due to a number of reasons. The reasons to include these techniques were; to revive indigenous and eco-friendly techniques, use a balanced mix of both new and old ways of effectively addressing the issue of WBAs, and to create ownership for the ABWAP among the senior citizens, whom were aware of the techniques that are abandoned by the today's youth.

[113] Drugs are used to control the boar population in the long term and reduce WBAs even among the non-treated households, a positive long-term externality of the AWBAP. It is claimed that female boars lose their fertility after consuming the drugs; however, the efficacy of the drugs has not yet been established.

[114] According to Chauhan (2009) and Hone and Ackison (1983), fencing is an effective way of mitigating crop damage because of WBAs. However, it is a costly technique; it is also not suitable for the RCTs that have a potentially higher spillover effect among the control group. Furthermore, such a technique does not fall under the purview of HRD training. For these reasons, fencing was not included as a component of AWBAP.

[115] According to the experts, in short term (i.e. in one cropping season), it will not be easy for the control group to imitate the treatment. However, there is a possibility of imitation by the group after a couple of seasons based on their curiosity that how come some of the farmers in their village or neighboring village have not been affected by WBAs?

[116] USD 1.0 = PKR 91 at the time of intervention, and hence, the direct cost per household was around USD 70.

is smaller among eligible non-member households than among eligible member households. Across villages, the eligible households spread over 30 villages, out of which, 19 villages had at least one AWBAP-treated household. Among the 19 treated villages, the number treated households in the village is distributed as: 1 household in 8 villages, 2 households in 4 villages, 3 households in 3 villages, 3, 6, 8, and 12 households in one village each. The villages with more than five treated households were large villages with several wards within.

In the previous chapters of this dissertation, I analyzed PHKN interventions/programs through the involvement and support of the concerned CO(s).[117] Under the standard CBD approach, it is not possible to implement an intervention without engaging the concerned CO(s); however, the AWBAP's unique design and implementation approach makes it a special case. The idea driving the AWBAP is novel, and hence, it is important to determine through a different design, namely, RCTs and domain, the effectiveness of an intervention implemented—that is to say, without involving the concerned CO(s). Therefore, the AWBAP is a litmus test for judging the ability of a member or nonmember to engage directly with a parent organization (e.g., an NGO, line agency, or donor), in the absence of involvement or support of an intermediary set-up (e.g., the COs concerned). The success of the AWBAP can move NGOs that take the CBD approach one step further—namely, by engaging an end-user directly—and can hence help them shape future interventions that evade elite capture.

The selected households were intimated by telephone about their participation in HRD training under the AWBAP. However, the theme and details of the program were not disclosed to the participants until they were actually participating in the training sessions. The program was implemented in February–March 2011, immediately following data compilation for the benchmark survey (Survey #3). It is worth mentioning that all the selected households participated in the program and successfully completed it; hence, the AWBAP has zero noncompliance, which implies that intent to treat (ITT) equals treatment on the treated (TOT). The AWBAP is an intervention comprising HRD training so that participants are given neither income transfer nor credit.[118] Therefore, in the case of the AWBAP, the possibility of the Hawthorne effect can be easily ruled out.[119]

To collect postintervention data, I implemented a household resurvey (Survey #5) in November

[117] For instance, Chapter 3 focuses on targeting performance, Chapter 4 addresses preference-matching, and Chapter 5 assesses welfare impact at the household level.
[118] The AWBAP involves the capacity-building of the treated-households in preventing WBAs.
[119] The Hawthorne effect refers to a temporary increase in the morale of the treatment and control group because of instant tangible gains, whether financial or nonfinancial. The households in control group might feel envoy of those in treatment group.

2011.[120] I used the data collected through the resurvey in the AWBAP impact assessment. Fortunately, all the eligible (197) households were successfully resurveyed, that is, there was no attrition. It is worth noting that the resurvey teams were totally blind to the implementation of the AWBAP.

6.3 Data

In this chapter, I employ the following two datasets.

i. Household benchmark survey (Survey #3 of Table 2.4, Chapter 2)

The dataset contains detailed household-level information regarding WBAs. I use this dataset to establish household eligibility for the AWBAP.

ii. Household resurvey (Survey #5 of Table 2.4, Chapter 2)

I use this dataset to undertake posttreatment comparisons of treated and nontreated households. The subsample of 569 households that were surveyed in both rounds and did not change their membership status is used for the analysis.

6.3.1 Comparison between eligible and non-eligible households

To determine the impact of the AWBAP, I use data pertaining to a subset of 197 of the 569 households from the aforementioned datasets; this subset comprises the so-called eligible households.[121] To describe quantitatively the context of the intervention, I compare the eligible households to the other subset of 372 of 569 households (henceforth termed "noneligible households"). In Table 6.1, I supply in Panel A summary statistics of the key variables representing the eligible households; Panel B contains those representing noneligible households. The two sets of households have almost-similar dwelling conditions. Nonetheless, the noneligible households have much better access to amenities like cable TV and natural gas than do the eligible households. On the other hand, a large proportion of the eligible households own and use cellular phones and radios, compared to the noneligible households. These factors suggest how difficult the topography of the study area is.

[120] The resurvey is implemented after one cropping season (almost seven months) into the intervention.
[121] The households that did not report WBAs in Survey #3 are considered noneligible households, and hence, they were not eligible to participate in the AWBAP.

The eligible households are not similar to the non-eligible households in terms of cash-flow[122], women empowerment[123], susceptibility to natural disasters[124] and land holdings.[125] The eligible households' agricultural land holdings[126] were five times larger than were those of non-eligible households; the eligible households had an unpaid consumption level that was twice that of non-eligible households; the eligible households had slightly larger family sizes than did non-eligible households. The eligible households closely resemble a typical Pakistani farm household.

According to the baseline figures, the average crop-income loss among the eligible households owing to WBAs is over PKR 7,900. In the following section, I conduct balance check tests that involve comparisons of the means of the key variables of the eligible households with and without AWBAP treatments.

6.3.2 Balance check tests

In Table 6.2, I compare the treated and nontreated households from among the eligible households by using the benchmark survey data. This comparison shows that in most of the cases, the difference between means of the two sets of households is statistically insignificant. These two types of household are similar in terms of dwelling conditions, asset holdings, demographics, cash inflows and outflows, and income loss due to WBAs. Therefore, I can safely claim that the randomization process resulted in two almost similar sets of households, and that there is no systematic difference between them.[127] The observed difference can be safely attributed to the impact of the AWBAP.

However, according to Table 6.2, all four consumption measures have higher values among

[122] As per cash-flow data, a larger proportion of eligible households receive remittances than do noneligible households. This finding indicates that subsistence farming is practiced in the study area. Furthermore, a considerable number of eligible households pay *Zakat*, but none receives *Zakat*.

[123] Women belonging to eligible households are more empowered (in terms higher mobility within the village) than those belonging to noneligible households. Owing to social norms of the study area, women mobility is constrained in several ways.

[124] This difference of land holdings arises from the presence of non-farming households, with no landholding at all, among the non-eligible households. According to my field observations, most of the farmers practice subsistence farming and grow different cereal crops (like maize and wheat, that are favored by the wild boars). Same was the case in the study period.

[125] Considerable variation can be seen in the location of eligible and non-eligible household. Moreover, the eligible households are more susceptible to natural disasters and shocks than are noneligible households. One-half of the former were affected by the 2010 floods, compared to one-third of the latter.

[126] Here, "land holdings" refers to all types of land, that is, owned, rented, or communal land used for agricultural purposes.

[127] Given the insignificant difference in the observable attributes of the treated and non-treated households and lucky draw based treatment into AWBAP, it is expected that the two set households are similar in both observable and non-observable attributes.

control households than among treated households. The difference is statistically significant for food consumption at the 5% level. As PHKN has implemented the randomization process strictly, I consider that this happened just by a chance. I will attempt to address this issue through empirical strategy of this chapter.

6.4 Empirical Strategy

First, I examine the impact of the AWBAP on crop-income losses, that is, a direct impact and then its impact on consumption, i.e. indirect impact. If randomization is implemented properly and the resulting two groups are completely similar in the statistical sense, *ex post*, then the single difference estimator will suffice to identify the AWBAP impact. As suggested through the balance check test, however, the non-treated households had slightly higher consumption than the treated households, *ex post*, although PHKN has implemented the randomization properly. Therefore, as a main specification, I employ the DID specification, which allows for potential non-randomized elements conditional on household fixed factors.[128] [129].

I employ the following econometric model for analysis of direct impact of AWBAP on crop income loss:

$Y_{it} = \beta_0 + \beta_1 X_i + \beta_2 T_t + \beta_3 X_i{*}T_t + \varepsilon_{it}$ (6.1)In Equation 6.1, I use as a dependent variable nominal crop-income losses owing to WBAs that is Y_{it}. X_i is a dummy variable that represents the AWBAP treatment (it takes a value of 1 if the household is in the treatment group), T_t is a dummy variable that represents the post-treatment period, and ε represents the error term. β_3, the coefficient on the interaction between X_i and T_t, is the DID estimator for the treatment impact. If the AWBAP intervention results in lower income losses, the coefficient β_3 should be negative and significant.Moreover, for indirect impact of the AWBAP on consumption, I use the following econometric model:

$$Y_{it} = \beta_i + \beta_2 T_t + \beta_3 X_i{*}T_t + \varepsilon_{it} \quad (6.2)$$

where Y_{it} is the measure of welfare for household *i* in period *t*, β_i is the household fixed effect, X_i is a dummy variable that represents the AWBAP treatment (it takes a value of 1 if the household is in the treatment group), T_t is a dummy variable that represents the post-treatment period, and ε represents the error term. β_3, the coefficient on the interaction between X_i and T_t, is the DID

[128] To be on the safer side, I control the unbalance in benchmark observations and use a double difference, not a single difference, as my main empirical specification in Section 6.5 and 6.6.

[129] The farmers grow different types of crops; therefore, it is difficult to assess impact of WBAs on quantity-based crop losses. To address this issue, I use monetary value of crop losses due to WBAs for analysis in this chapter.

estimator for the treatment impact. If the AWBAP intervention results in higher welfare, the coefficient β_3 should be positive and significant.

For estimation of Eq. 6.2, I use different measures of household annual consumption as the dependent variable Y_i: total expenditures (*tot_exp*), per-capita expenditure, (*exp_pc*), food expenditures (*exp_food*), and nonfood expenditures (*exp_nonfd*).[130]

I also invetigate possibility of heterogeneous welfare impact of the AWBAP in three different ways. First, to see whether the impact among the treated households varies based on their membership status; I divide the eligible households between member and non-member households and assess impact of the AWBAP. Second, to analyze the possibility of lower impact among the treated households that were also hit by the 2010 floods, I conduct impact analysis by segregating the eligible households between those affected by WBAs only and those affected by both WBAs and the floods. Third, to find the possible spillover effect of the AWBAP on the non-treated neighbors, I use non-treated eligible households belonging to the villages without AWBAP as control instead of employing the non-treated and eligible households as control.

6.5 Impact of Interventions on Income Loss because of Wild Boar Attacks

The direct impact of AWBAP treatment is shown in Figure 6.2 and Tables 6.3 (A–C). According to Figure 6.2, the treated households reported zero losses in the posttreatment period. This shows that AWBAP treatments can effectively mitigate crop-income losses among treated households. The results are further confirmed by the findings presented in Tables 6.3 (A–C), where treated households reported zero income losses because of WBAs (i.e., a 0-percent income loss among the eligible and treated households). According to Table 6.3 (C), DID impact of AWBAP is prevention of PKR 4,080 worth of crop losses among each of the eligible and treated households during the study period. Moreover, as per single difference number of AWBAP shown in Table 6.3 (A), the treatment prevented PKR 7,260 worth of crop losses among each of the eligible and treated households during the study period. Since the direct cost of AWBAP treatment per household is PKR 6,000, the AWBAP can be considered cost-effective, as far as the direct costs of the program are concerned (based on single difference impact of the program).

[130] All consumption measures constitute the household's annual consumption expenditure, including the imputed value of in-kind transactions. Moreover, the non-food expenditures include annual expenditures on fuel and electricity for cooking and heating, clothes and shoes, transportation, health care, education, social functions, recreational goods and other. Self-consumption is included in food consumption while other expenditures are the part of non-food expenditures..

On average, the nontreated households reported PKR 5,000 worth of crop losses in the posttreatment period (Table 6.3 A-B). Here, it is pertinent to mention that more than 80 percent of the eligible and nontreated households were again attacked by wild boars during the posttreatment period.[131] On the other hand, only 17 percent of the noneligible households reported losses during the same period, suffering an average income loss of PKR 1,300. The results point to the stochastic nature of WBAs. Moreover, the significant difference in WBA rates between the eligible and nontreated households, and noneligible households (80 and 17 percent, respectively) validates the eligibility criteria adopted by the AWBAP.

6.6 Impact of Interventions on Household Consumption

6.6.1 Basic Results

Figure 6.3 shows the distribution of the total consumption of the eligible households, by treatment status and survey year. From this figure, it is difficult to infer any differences across treatment statuses. I report different measures of household annual consumption: total consumption (*tot_exp*), per-capita consumption (*exp_pc*), food consumption (*exp_food*), and nonfood consumption (*exp_nonfd*) by eligibility and treatment status in Table 6.4(A). Moreover, I employ these measures of household consumption as the dependent variable Y_i (Models 1–4 of Table 6.4-B) in the fixed effect panel estimation (i.e. estimation of Eq. 6.2).. The signs of the coefficients on most of the variables (three of four) are positive; however, none of the coefficients is statistically significant.

Now the question is: despite the fact that the AWBAP was able to reduce the income loss by PKR 4,080 (the single difference number for the same is PKR 7,260), which seems to be a permanent impact because the main component of the intervention was HRD trainings, the household consumption did not respond by a similar magnitude.

The statistically insignificant impact of AWBAP treatment may be owing to some implicit cost[132] in the program that is associated with treatment, and/or another shock. For example, the 2010 floods in the study area could possibly have diluted the welfare impact of the AWBAP. I

[131] As stated before, the non-treated farmers are doing nothing to control WBAs. They gave up indigenous ways, used for scaring the wild animals and keeping them way from their plots, years ago.

[132] The implicit cost associated might be labor income loss, psychological (e.g., harassment) and physical fatigue (duress, violence)—particularly for women participating in CBD activities, working along with a women-focused and women-driven NGO in a male-dominated society, mostly against the local elite. Owing to the special context of the study area, one can expect there to be a cost where women are systematically excluded from participatory development (Agarwall, 2001).

will attempt to analyze this aspect as heterogeneous impact assessment in subsection 6.6.2.

6.6.2 Heterogeneous Impact

The insignificant impact on consumption might have been due to the ignorance of the heterogeneous impact. To identify and/or quantify the possible heterogeneous impact, if any, I extend the analysis of Table 6.4 (B) by segregating the treated households into member and nonmember households (results are reported in Table 6.5, panel – A). I find insignificant DID impact for the treated household, regardless of their membership status (panel A, Table 6.5). The DID coefficients among member households were overall small, while those among non-member households had large absolute values, positive for food and negative for non-food (although not statistically significant).

As discussed in the summary statistics (subsection 6.3.1 of this chapter), a considerably large number of eligible households (around 21 percent) were also affected by the 2010 floods.[133] To determine how the impact varies across the treated households that were affected and not affected by the floods, I extend the analysis of Table 6.4 (B) by segregating the treated households into those affected and not affected by the floods (Table 6.5 – panel B). I find an insignificant difference between the households affected and not affected by floods; hence, the impact of the AWBAP is similar for all the treated households, whether or not they were affected by the floods.

Finally, I use eligible households living in a non-treated village as the control. Once again, I find an insignificant DID impact (panel C, Table 6.5). The two coefficients on the direct treatment and the indirect treatment have the same sign and similar magnitudes, but statistically insignificant. Since the null hypothesis of the equality of the two coefficients cannot be rejected, I re-estimate the model merging the two dummy variables. The coefficient on the merged dummy remains insignificant for all four dependent variables (not reported). Therefore, it is unlikely that the insignificant impact of AWBAP on consumption was due to a spillover effect.

[133] One may ask how come effects of the 2010 floods are controlled through the regression. The answer is; its' level effects are controlled through first difference, while its' growth effects are separately taken care of and the results of which are shown in Table 6.5 (B).

6.7 Robustness Checks

As shown in Section 6.5, the treatedhouseholds did not suffer from WBAs in the posttreatment period, and hence, they reported no crop-income loss. In subsection 6.6.1, I show the positive but insignificant indirect impact of the AWBAP (i.e. its impact on consumption). The savings in crop-income may enhance unpaid consumption of the treated household. Therefore, as an alternative way of assessing the welfare impact of the AWBAP, I determine the AWBAP's impact on the annual consumption of unpaid food consumption.[134]

Using as dependent variables two measures for unpaid consumption: total unpaid consumption (in thousands of PKR), and unpaid consumption as a proportion of total food consumption, I employ a basic model that is similar to that used in Table 6.4-B. The estimation results are reported in Panel O of Table 6.6. In Table 6.6, I also repeat three types of heterogeneous analysis reported in Table 6.5 (results are reported in Panels A-C of Table 6.6). Three of the DID coefficients are statistically significant but with inconsistent signs and low significance levels. I thus interpret the results in Table 6.6 as showing no significant impact of AWBAP even if I evaluate the changes in unpaid consumption. This suggests that the study area is connected with well-defined agricultural markets so that the excess output can find its way to the local market. This is similar to tradable commodities in the model of agricultural households, as proposed by Singh et al. (1985). Given this market conditions, since the impact on the total consumption is nil, the impact on the unpaid consumption is also nil.[135]

6.8 Conclusion and Recommendations

This chapter examined the household vulnerability to wild animal attacks and the impact of an intervention to reduce its damage on crops. Based on a two-period panel dataset of households collected in rural Pakistan, I first quantify the extent to which farmers are vulnerable to attacks by wild boars. I find that the attacks affected the crop income of 34% of the sample households, with the average damage equivalent to approximately 3% of the total annual consumption and 20% of the own-produced food consumption. Then, I examine the impact of a randomized intervention to enhance household's capacity to reduce the income loss. I find that the intervention is highly effective in eliminating the crop income loss of treated households,

[134] Consumption is based on self-produced and self-consumed agricultural output.

[135] It is worth mentioning that the study area experienced a macro-level price shock, including food-price hyperinflation, during the post-treatment period. Since I do not have farm-income data, I speculate that the treated households did not consume self-produced farm output, but sold the output in the local market to leverage the prevailing price hikes.

although its impact on a number of consumption measures is insignificant.

My tentative interpretations to solve the puzzle of insignificant impact on consumption are the following. It is possible that a hidden cost of the treatment exists so that the income loss reduction of PKR 4,080 (or single difference number PKR 7,260) owing to the AWBAP was an overestimation of the benefit of the intervention; and the income loss reduction was perceived by treated households to be transitory so that the increase in the permanent income was perceived to be much smaller.

Regarding the hidden and implicit cost, I can list the opportunity cost of labor to follow the AWBAP directions, which could have resulted in lower wage income; the material and drug costs, whose shadow prices could be much higher than their market prices if households are credit-constrained; the social cost of participating into a HRD training organized by a women-led NGO in a male-dominated society, etc. This interpretation needs to be empirically tested using the follow-up survey results and other experiments, for example, with monetary incentives offered to participating households as compensation for labor-income loss. However, the compensation option should be exercised carefully, while bearing in mind the Hawthorne effect of monetary incentives.

Regarding the transitory perception, a simple calculation could be useful. If households perceived the income loss reduction of PKR 4,080 (or single difference number PKR 7,260) to be permanent, their permanent income per year would rise by the same amount. Household consumption would then rise by an amount closer to this increase. On the other hand, if households perceived the income loss reduction to be one time phenomenon, their permanent income per year would rise only by PKR 4,080 (or single difference number PKR 7,260) times the interest rate approximately, since the increase is spread throughout the life time. Then it is not surprising to find a statistically insignificant impact. The reason for the treated households to perceive the income loss reduction to be transient could include the lack of understanding of measures so that the treated households fear that they will not be able to repeat them without PHKN's help; some of key materials or drugs, although cheap if evaluated at the market prices, may not be available in the future; the one-time experiment did not convince the treated households of the effectiveness of the treatment, etc.

With the data at hand, I am not able to test these two interpretations further. In addition to these two, there is another possibility that the insignificance was simply a statistical failure from the small sample size. In Table 6.4 (B), the DID point estimate on the total expenditure was found

to be PKR 4,400, which is a substantial amount, comparable to the AWBAP's loss-reducing effect of PKR 4,080. However, the DID estimate was statistically insignificant. With more data points, the DID estimate would become statistically significant. By expanding my dataset to include data from the third round household survey will help examine this possibility. Using the three-period panel, instead of the two-period panel, I will be able to examine the possibility mentioned above that the treated households were not convinced with the income loss reduction effect with only one time trial. I will see whether the loss reduction thanks to AWBAP measures was sustained in the third year without the PHKN's intervention.

As a chapter in a dissertation on CBD interventions, the overall results of this chapter suggest that ABWAP has been successfully implemented even without the full-fledged assistance of the existing CBD setup. This is a surprising result given the activities of PHKN. It is possible, however, that the insignificant difference between treated member households and treated non-member households was due to the small size of the number of treated non-member households. Further exploration of this issue and the examination of the external validity of the AWBAP are left for further research. Moreover, since the main component of the intervention was a human resource development training, I would like to know how the capacity building occurred within the treated households, which is currently in a black box. This is also left for further research.

Figure 6.1

Flow-Chart of Anti-WBA Program

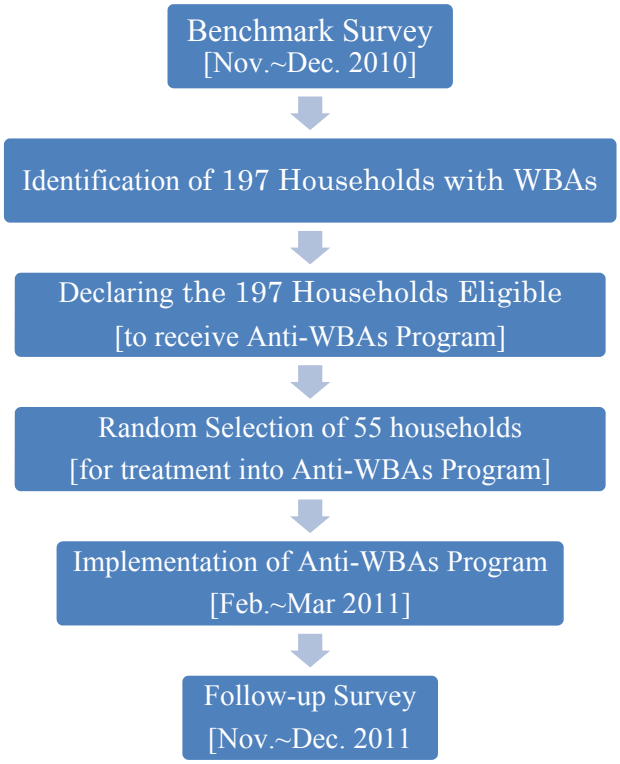

Figure 6.2

Graphical Depiction of Crop-income Losses by Treatment Status and Survey Year

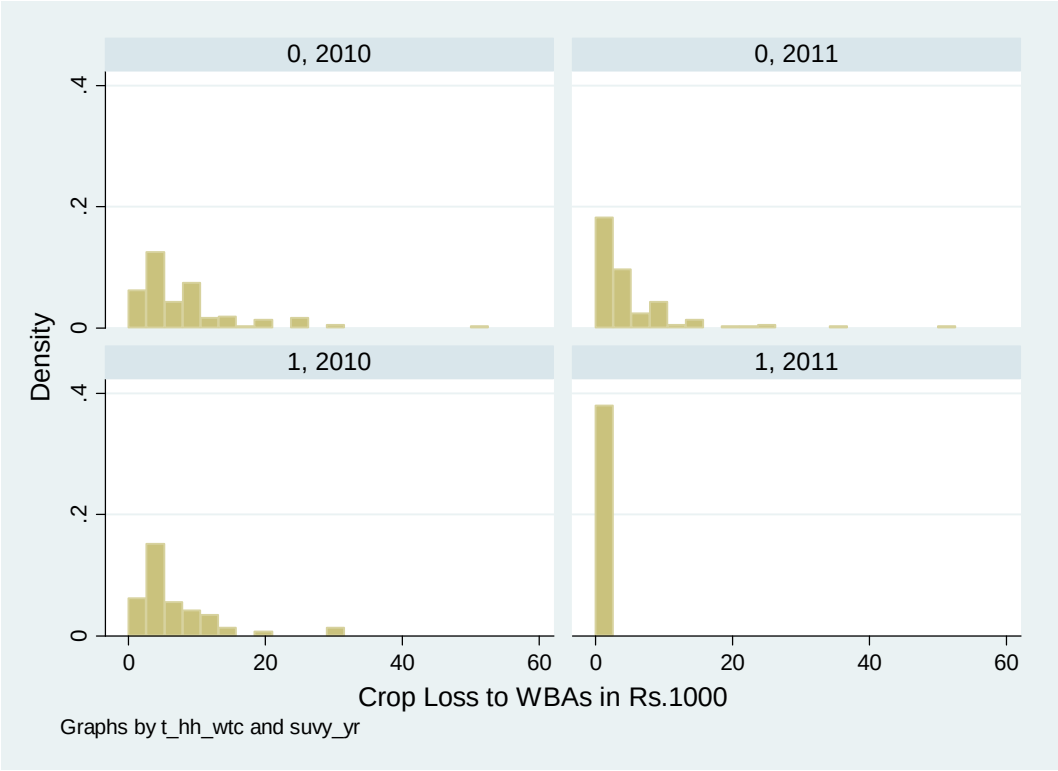

Figure 6.3

Graphical Depiction of Consumption by Treatment Status and Survey Year

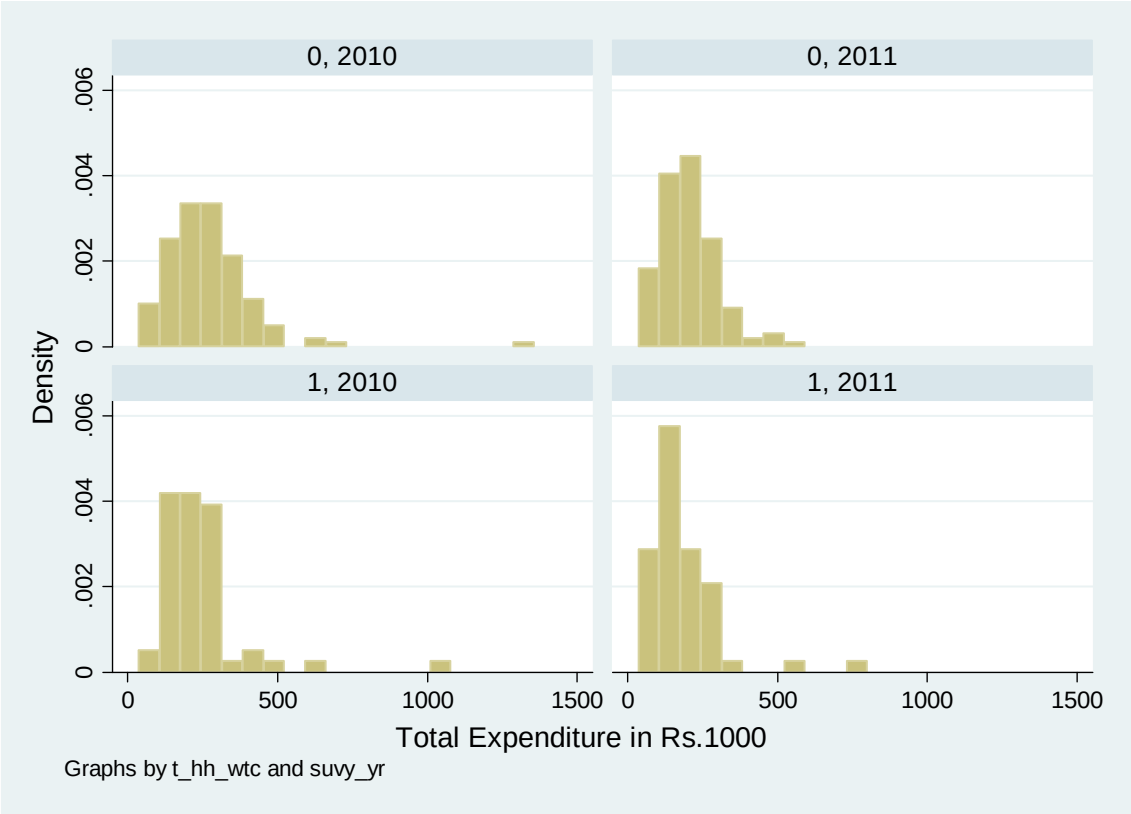

Table 6.1

Comparison between Eligible and Non-eligible Households

Description	Variable	Panel A (Eligible Households) Mean	Std.Dev.	Min	Max	Panel B (Non-eligible Households) Mean	Std. Dev.	Min	Max
Household asset indicators									
area of house (in Marlas)	**area_hh**	11.03	7.04	1	40	8.85	5.45	1	40
house condition (Pakka:concrete-house=1 Kachha:mud-house=0)	**h_cond**	0.50	dummy	0	1	0.44	dummy	0	1
house floor (*Pakka:* paved=1 *Kachha:* dirt floor=0)	**h_floor**	0.10	dummy	0	1	0.13	dummy	0	1
number of room in house	**room_no**	3.21	1.34	1	9	2.60	1.23	1	9
house boundry exist; Yes=1, otherwise 0	**h_boundry**	0.88	dummy	0	1	0.92	dummy	0	1
toilet exists in house; yes=1, otherwise 0	**toilet**	0.89	dummy	0	1	0.92	dummy	0	1
drainage system is available in house; yes=1, otherwise-0	**drainge**	0.40	dummy	0	1	0.43	dummy	0	1
cable TV connection; yes=1, otherwise 0	**cab_tv**	0.00	dummy	0	0	0.01	dummy	0	1
natural gas connection for cooking and heating; yes=1, otherwise 0	**gas**	0.04	dummy	0	1	0.09	dummy	0	1
radio owned by the household; yes=1, otherwise 0	**radio**	0.32	dummy	0	1	0.28	dummy	0	1
cell phone owned by the household; yes=1, otherwise 0	**cellphone**	0.93	dummy	0	1	0.85	dummy	0	1
telephone (landline) connection and use the household; yes=1, otherwise 0	**telephone**	0.16	dummy	0	1	0.11	dummy	0	1
total landholding (area in Kanals)*	**tot_area_ol**	13.79	14.90	0	100	2.48	6.06	0	50
No of Observations	**197**					**372**			

Source: Household benchmark survey (Survey #3) has been for this table.

Note: Household benchmark survey (Survey #3) has been for this table.

* On average the eligible household owns 1.7 acres of land, which is the normal area of single agricultural plot. One*Kanal* is equal to 0.125 acres

Table 6.1

Comparison between Eligible and Non-eligible Households

Description	Variable	Panel A (Eligible Households) Mean	Std.Dev.	Min	Max	Panel B (Non-eligible Households) Mean	Std. Dev.	Min	Max
Household's Demography									
household size	**hhsize**	6.79	2.76	2	16	5.84	2.58	1	16
female/male ratio	**fem_rate**	1.08	0.76	0.1429	5	1.18	0.93	0	5
household head's age	**hh_age**	50.48	13.26	20	85	49.21	14.38	20	90
household head is literate; yes=1, otherwise 0	**hh_lite**	0.77	dummy	0	1	0.71	dummy	0	1
household head's years of education	**hh_edu**	6.47	4.37	0	16	5.60	4.34	0	16
Household's Cash flow									
number of fulltime employed household members	**fulltime_e~o**	1.57	0.90	0	5	1.40	0.85	0	5
household receives remittance; yes=1, otherwise 0	**remittance**	0.26	dummy	0	1	0.16	dummy	0	1
number of remitter employed household members	**no_remitr**	0.32	0.61	0	3	0.20	0.50	0	4
annual remittance (in 000's PKR.)	**ann_remitt~e**	73.23	199.65	0	1800	41.60	125.62	0	960
household receives pension income; yes=1, otherwise 0	**pension_in~e**	0.19	dummy	0	1	0.14	dummy	0	1
annual pension receipts (in 000's PKR)	**annul_pens~n**	8.44	18.20	0	72	5.46	14.78	0	84
zakat (in Rs.) received by the household	**zu_in**	0.00	dummy	0	0	0.05	dummy	0	1
annual *Zakat* receipts (in 000's PKR.)	**annl_zuin**	0.00	0	0	0	0.27	1.67	0	25
zakat (in PKR.) paid by the household	**zu_out**	0.15	dummy	0	1	0.08	dummy	0	1
annual *Zakat* payments (in 000's PKR.)	**annl_zu_out**	0.57	2.23	0	25	0.29	1.33	0	12
No of Observations	**197**					**372**			

Source: Prepared by the author (same as the following tables and figures).

Table 6.1

Comparison between Eligible and Non-eligible Households

Description	Variable	Panel A (Eligible Households) Mean	Std.Dev.	Min	Max	Panel B (Non-eligible Households) Mean	Std. Dev.	Min	Max
Household's annual consumption expenditure including the imputed value of in-kind transactions									
total expenditure (in PKR. 000's)	**tot_exp**	263.55	147.77	75.84	1356.67	212.12	106.54	28.19	847.89
per capita expenditure (in PKR. 000's)	**exp_pc**	40.36	16.90	20.25	127.63	39.35	17.18	11.96	142.58
food expenditure (in PKR. 000's)	**exp_food**	182.81	81.50	61.46	648.67	152.68	69.55	21.42	479.91
non-food expenditure (in PKR. 000's)	**exp_nonfd**	80.74	87.53	7.40	763.00	59.45	47.30	2.50	434.60
unpaid expenditure (in PKR. 000's)**	**selfp_selfc**	40.26	31.43	0.00	166.67	12.11	24.60	0.00	167.28
unpaid expenditure as a proportion of total food expenditure (in PKR. 000's)	**spsc_totfd~p**	0.22	0.14	0.00	0.55	0.06	0.12	0.00	0.56
Women's mobility									
Women of the household are allowed to move freely within the village	**wmiv**	0.62	dummy	0	1	0.55	dummy	0	1
Susceptibility to natural and shocks disasters									
The household was affected by 2010 floods	**fldaffecte~h**	0.50	dummy	0	1	0.31	dummy	0	1
The household suffered damages due to attacks by wild boars	**wildboar_a~k**	1.00	dummy	1	1	0.00	dummy	0	0
Household affected by both floods and WBAs	**wba_flood_hh**	0.21	dummy	0	1	0.13	dummy	0	1
estimated crop-loss due to wild boar attacks (WBA) in PKR. 000's	**estloss_wba**	7.91	6.87	0.2	50	0.00	0.00	0	0
household eligible to receive randomized treatment to withstand WBA	**eligibilit~t**	1	dummy	1	1	0	dummy	0	0
household treated with AWBAP (dummy)	**t_hh_wtc**	0.14	dummy	0	1				
treated households*follow-up (dummy)	**cross**	0.14	dummy	0	1				
household treated with AWBAP	**fldaffecte~h**	0.50	dummy	0	1				
Household affected by both floods and WBAs*follow-up (dummy)	**awbap_fld**	0.07	dummy	0	1				
No of Observations	**197**					**372**			

Note: i. Household benchmark survey (Survey #3) has been for this table.

** Consumption based on self-produced farm/nonfarm output

Table 6.2
Balance check tests

Variable	Mean for each group: A - Control Household (n =142)	Mean for each group: B - Treated Household (n =55)	Difference (A)-(B): Mean		(S.E.)
Household asset indicators					
area_hh	11.08	10.89	0.19		(1.09)
h_floor	0.11	0.05	0.06		(0.04)
h_cond	0.52	0.45	0.07		(0.08)
h_boundry	0.89	0.87	0.01		(0.05)
room_no	3.27	3.07	0.19		(0.21)
toilet	0.89	0.87	0.02		(0.05)
drainge	0.42	0.36	0.05		(0.08)
cellphone	0.95	0.89	0.06		(0.05)
tot_area_ol	14.83	11.09	3.74		(2.17)
Household Demography					
hhsize	6.95	6.38	0.57		(0.43)
fem_rate	1.03	1.22	-0.19		(0.14)
hh_age	50.97	49.22	1.75		(1.98)
hh_lite	0.80	0.71	0.09		(0.07)
hh_edu	6.69	5.91	0.78		(0.71)
Household cash flow					
fulltime_ehhm_nc	1.56	1.60	-0.04		(0.15)
zu_out	0.15	0.15	0.00		(0.06)
Crop income loss due to wild boar attacks					
estloss_wba	8.16	7.26	0.90		(1.00)
Household consumption					
tot_exp	272.23	241.15	31.07		(23.35)
exp_pc	40.61	39.72	0.89		(2.78)
exp_food	190.20	163.75	26.45	*	(11.09)
exp_nonfd	82.03	77.41	4.62		(4.62)

Notes:

1. The standard errors are reported in parenthesis, estimated under the assumption that allow

2. * $p < 0.05$

3. Household benchmark survey (Survey #3) data has been employed for calculations in this

Table 6.3 (A)

bution of Crop-Income Losses (in PKR.1000) by Eligibility and Treatment S

Survey Year/ [S.D]	Eligible & Treated HH (55 households)	Eligible & Non-treated HH (142 households)	Non-eligible HH (372)
2010	7.26	8.16	0
[S.D]*	5.937	7.206	0.000
2011	0	4.98	1.34
[S.D]	0.000	6.721	6.212

*[S.D] Refers to Standard Deviation

Table 6.3 (B)

Distribution of Crop-Income Losses (% age of households attacked) by Eligibility and Treatment Status

Survey Year	Eligible & Treated HH (55 households)	Eligible & Non-treated HH (142 households)	Non-eligible HH (372)
2010	100	100	0
2011	0	83	17

Note: The tables are prepared by the author.

Table 6.3 (C)
Welfare Impact (in terms of income losses in PKR.1000) of the AWBAP
(Basic Specifications used for estimating Equation 6.1)

Explanatory Variables:	Crop Income Losses (in Rs.1000)
Treatment*Followup	-4.080**
	(1.14)
Follow-up survey (Dummy)	-3.180**
	(0.88)
Intercept	7.907***
	(0.35)
Household fixed effects	(Yes)
R-squared	0.236
F-statistics	40.612
Level of Significance	0.000
Number of Obs.	394

Notes:
1. Standard errors in parentheses.
2. *p<0.05, **p<0.01, ***p<0.001.
3. The tables are prepared by the author.

Table 6.4 (A)
Distribution of Consumption (in PKR.1000) by Eligibility and Treatment Status

Survey Year	Eligible & Treated (55 households)	Eligible & Non-treated (142 households)	Non-eligible (372 panel households)
(A) Total expenditures (tot_exp)			
2010	241.15	272.23	212.12
	(146.78)	(147.75)	(106.54)
2011	182.22	208.88	177.79
	(120.25)	(91.49)	(102.55)
(B) Per-capita expenditure (exp_pc)			
2010	39.72	40.61	39.35
	(17.83)	(16.58)	(17.18)
2011	28.86	31.14	32.20
	(14.16)	(12.26)	(15.70)
(C) Food expenditures (exp_food)			
2010	163.75	190.20	152.68
	(61.94)	(86.99)	(69.55)
2011	116.70	142.68	119.34
	(84.81)	(63.11)	(63.73)
(D) Nonfood expenditures (exp_nonfd)			
2010	77.41	82.03	59.45
	(104.98)	(80.15)	(47.30)
2011	65.52	66.20	58.44
	(45.51)	(41.26)	(48.25)

Note: Figures in parenthesis are standard deviations.

Table 6.4 (B)

Impact of the AWBAP on Household Consumption (Basic Specifications)

	Dependent Variable:			
Explanatory Variables:	*tot_exp*	*exp_pc*	*exp_food*	*exp_nonfd*
Treatment*Followup	4.409	-1.398	0.471	3.938
	(17.598)	(2.632)	(9.538)	(15.144)
Follow-up	-63.345***	-9.463***	-47.519***	-15.827
	(12.837)	(1.745)	(7.547)	(8.241)
Household fixed effects	Yes	Yes	Yes	Yes
R-squared	0.203	0.276	0.351	0.030
F-statistics for zero slope	14.61***	18.31***	22.82***	2.02

Notes:

1. Estimated by a fixed effect panel specification with the number of observations at 394 (2 periods x 197 eligible households).
2. Robust standard errors clustered at the village level are shown in parentheses.
3. * p<0.05, ** p<0.01, *** p<0.001.

Table 6.5

Impact of the AWBAP on Household Consumption (Heterogeneous Impact)

	Dependent Variable:			
DID parameter estimate	*tot_exp*	*exp_pc*	*exp_food*	*exp_nonfd*
A. CO member vs. non-member				
Treatment*Followup*CO_member	8.807	-1.035	-5.604	14.411
	(13.517)	(2.476)	(8.561)	(8.283)
Treatment*Followup*(1-CO_member)	-25.746	-3.889	42.127	-67.873
	(104.500)	(12.871)	(34.075)	(96.697)
B. With vs. without the damage due to 2010 floods				
Treatment*Followup*Flood_damage	10.039	-0.572	-3.693	13.732
	(15.523)	(3.027)	(10.795)	(8.077)
Treatment*Followup*(1-Flood_damage)	-0.639	-2.139	4.204	-4.842
	(28.207)	(3.633)	(13.716)	(27.062)
C. Using nontreated village as the control				
Treatment*Followup	-0.467	-2.921	-11.768	11.301
	(20.974)	(3.046)	(12.732)	(16.616)
(1-	-6.127	-1.913	-15.380	9.252
	(20.516)	(2.707)	(12.500)	(13.506)

Notes:
All specifications A, B, and C were estimated by a fixed effect panel specification similar to those in Table 3. Coefficients on the followup dummy, R2, etc. are not reported to save space. The number of observations is 394 (2 periods x 197 eligible households). None of the difference was statistically different from zero at the 5% level.

Table 6.6
Impact of the AWBAP on Household Consumption in Kind

	Dependent Variable:	
DID parameter estimate	*selfp_selfc* (total unpaid food consumption in PKR.1000)	*spsc_totfd~p* (unpaid food consumption as a proportion of total food consumption)
O. Homogeneous impact		
Treatment*Followup	2.005	0.012
	(3.526)	(0.025)
A. Heterogeneous impact: CO member vs. non-member		
Treatment*Followup*CO_member	1.056	0.009
	(3.590)	(0.027)
Treatment*Followup*(1-CO_member)	8.512	0.034
	(6.734)	(0.042)
B. With vs. without the damage due to 2010 floods		
Treatment*Followup*Flood_damage	-2.328	-0.038
	(4.373)	(0.032)
Treatment*Followup*(1-Flood_damage)	5.890	0.057*
	(4.104)	(0.024)
C. Using nontreated village as the control		
Treatment*Followup	-6.405	-0.031
	(5.337)	(0.028)
(1-	-10.568*	-0.054*
	(5.012)	(0.024)
Mean of the dep.var. in 2010	40.255	0.218
[Std.dev. of the dep.var.]	[31.430]	[0.140]

Notes:
Both specifications A and B were estimated by a fixed effect panel specification similar to those in Table 3. Coefficients on the followup dummy, R2, etc. are not reported to save space. The number of observations is 394 (2 periods x 197 eligible households). * $p<0.05$.

Appendix Table 6.1

Impact of the AWBAP on Household Consumption (Single difference estimates)

	Dependent Variable:			
Coefficient on the treatment dummy	*tot_exp*	*exp_pc*	*exp_food*	*exp_nonfd*
O. Homogeneous impact				
Treatment	-26.664	-2.285	-25.983*	-0.681
	(17.051)	(1.999)	(12.485)	(6.112)
A. CO member vs. non-member				
Treatment*CO_member	-42.674**	-3.769	-37.334***	-5.340
	(13.864)	(2.050)	(9.286)	(6.684)
Treatment*(1-CO_member)	83.119	7.892	51.848	31.271
	(79.285)	(5.157)	(61.789)	(23.071)
B. With vs. without the damage due to 2010 floods				
Treatment*Flood_damage	-51.548**	-4.828**	-40.667**	-10.881
	(15.036)	(1.643)	(11.243)	(6.128)
Treatment*(1-Flood_damage)	-4.354	-0.005	-12.819	8.465
	(31.028)	(3.551)	(22.676)	(9.885)
C. Using nontreated village as the control				
Treatment	-50.857	-2.107	-57.487**	6.63
	(25.895)	(2.994)	(20.795)	(8.748)
(1-Treatment)*Treated_village	-30.401	0.224	-39.589*	9.187
	(19.544)	(2.771)	(16.631)	(7.385)

Notes:
1. All specifications were estimated by OLS using the eligible household samples in year 2011 (the number of observations is 197). Coefficients on the intercept are not reported to save space.
2. Robust standard errors clustered at the village level are shown in parentheses.
3. * p<0.05, ** p<0.01, *** p<0.001.
4. All the figures are in PKR. 1000

Chapter 7: Conclusion

This chapter concludes the dissertation, and it comprises three sections: a summary of findings, suggested directions for future research, and policy implications.

7.1 Summary of Findings

In this section, I first summarize my findings, based on the quantitative results of the core chapters. I then surmise how those findings could be interpreted, and consider their implications, based on my careful assessment. These quantitative findings correspond to the major hypotheses of this dissertation.[136]

In Chapter 3, I analyzed the targeting performance of the CBD approach, by quantifying the relationship between CO villages with village characteristics and CO households with household and village characteristics. Through this analysis, I establish the PHKN's ability to reach out not only to poorer villages (i.e., those villages with lower adult literacy rates, lower availability of basic amenities, and higher susceptibility to natural disasters), but also poorer households (i.e., those households lacking access to amenities). Moreover, the analysis also reveals that villages whose households have better education and social endowments are more likely to join the PHKN, and this may raise concerns vis-à-vis potential elite capture. However, this concern is alleviated in Chapter 4 of the dissertation.

In Chapter 4, I investigate the intra-group dynamics of a CO, by analyzing the PHKN's preference-matching process. I analyze the preference-matching in two ways. First, I match the preferences of CO members, CO proposals, and PHKN interventions; second, I attempt to find the correlates of preference-matching. The results show that the match percentage between members' preferences and CO proposals was 70 percent and that between CO proposals and PHKN interventions was 52 percent. Multivariate regression results show that no household characteristics affect the match between members' preferences and CO proposals and no CO characteristics affect the match between CO proposals and PHKN interventions. The findings thus confirm the nonexistence of elite capture and no disparity between female and male COs. On the other hand, I cannot cleanly identify the potential influence of the facilitator (the PHKN representative) in the formulation of CO plans. I find the facilitator to have no influence in the preference-matching process—and neither does the social status or networking of the CO members, at least quantitatively. I consider this finding beneficial to PHKN, because it points to

[136] Bear in mind that the major hypotheses of this dissertation are: whether CBD interventions are well targeted towards the poor, and if yes, under what conditions; whether CBD interventions improve the welfare of its participants, and if yes, under what conditions.

the absence of external influences in its preference-matching process.

In Chapter 5, I assessed the welfare impact of participation in CBD activities on an array of household welfare indicators, e.g., consumption, credit access, women's empowerment, and *Zakat* payment. For the impact assessment, I used panel analysis and the DID econometric technique. I find that participation in CBD activities can improve the welfare of member households in terms of women's empowerment, credit access, *Zakat* payment, and their resilience to withstand shocks. On the other hand, I note the minimal impact of CBD membership on consumption growth. One way possible way of evaluating the impact of PHKN participation on welfare measures of the households will be to investigate how the impact varies according to the types of PHKN interventions, such as MIP, a specific type of HRD training, etc. However, without incorporating this kind of heterogenous impact, the current exercise is an attempt to evaluate the impact of participation (the first stage of PHKN intervention) rather than the impact of individual interventions in later stages.

In Chapter 6, I investigated the impact of HRD in reducing vulnerability to wild animal attacks. More specifically, I assess there the impact of the AWBAP on crop-income losses owing to WBAs, and that on the welfare of recipient households. The AWBAP was implemented as an RCT design. To determine the impact of the AWBAP on crop-income losses (i.e., a direct impact), I use DID econometrics technique. Moreover, to assess the impact of the program on other household welfare indicators, I also adopt the DID technique with household fixed effect. According to my results, the AWBAP is highly effective in eliminating the crop losses of treated households. However, the programs has an insignificant impact on household consumption. The internal validity of the analytical results is guaranteed by virtue of the randomized design; however, the AWBAP is found to have a positive but insignificant indirect impact on a number of welfare indicators, on which I will elaborate further in the next section.

To overview these chapter-wise results, on the speculative side,[137] I consider the unprecedentedly strong involvement of women in the CBD process—namely, in project design and implementation—to have brought about the aforementioned improvements in CBD outcomes (e.g., targeting performance and welfare impact) to a certain extent. In other words, I link this improvement with the true ownership of the CBD process by the women involved at

[137] I derive this speculation partly based on the results in Chapter 4 and partly based on the basic philosophy of PHKN. In Chapter 4, I showed that female COs had better preference matching than male COs, although the difference was not robustly significant. Regarding the PHKN philosophy of a women-driven and women-focused NGO, a partial support is given by descriptive analysis showing an overwhelmingly strong presence of female COs among its network of COs.

the management and community levels; this indeed constitutes a unique case in the context of Pakistan. Moreover, this unique context is helpful in diverting political influence away from the CBD process and thus in eliminating elite capture.

7.2 Directions for Future Research

This section identifies directions for future research that, when undertaken, could support and extend the findings of this dissertation.

The PHKN offers different types of HRD training, each with different outcomes. Therefore, it is important to know how a specific type of training impacts the welfare of its recipient. Nevertheless, in this dissertation, I was unable to evaluate HRD training on the basis of its components. Hence, it is worthwhile to clarify the mechanism by which HRD training affects members. This is left to future research.

With the current village-level dataset, I was not able to identify either the endogenous placement effect or the self-selection effect cleanly, as discussed in Chapter 3. I intend to address this data shortcoming in future village survey(s) and research. In order to deal with endogeneity issues, I intend to collect recall data for the endogenous factors, e.g. community-based schools, TBAs, and nontraditional DSFs, which is left for future research.

In the analysis detailed in Chapter 4, I used quantitative measures to assess the influence of facilitator(s) and of the social status of members in the preference-matching process; nonetheless, I could not obtain decisive evidence. Work toward a better understanding of the preference-matching process is worth further investigation. One of the reasons for the unclear evidence is the information contained within these variables. For instance, the quantitative measures may be incapable of capturing the exact level of influence of each variable, and hence, they need to be complemented by some qualitative measures. Another possibility is inclusion of other potential factors like the level of trust among the CO members that may affect the preference-matching process and hence their satisfaction regarding PHKN's activities. The inclusion of these additional dimensions, possibly in the form of social experiments, laboratory games and satisfaction survey of CO members are left for future analysis.

There are several possible explanations for the insignificant impact of participation in CBD activities on the consumption-based welfare of the member households (Chapter 5). First, the minimal impact on consumption may imply that households are poor in terms of both the observable and unobservable characteristics that relate to consumption growth. Hence,

participation in CBD activities may be helpful in maintaining a certain level of consumption, but not in increasing consumption growth. Second, the impact on consumption may take longer to manifest. Third, there is the possibility of some implicit cost associated with participation in CBD activities. One can expect a cost owing to the special context of the study area, where women are systematically excluded from participatory development (Agarwall, 2001)—a cost that may hinder the consumption growth of the member households. More specifically, participation in CBD activities may exact psychological (harassment) or physical (duress or even violence) costs on the members, who are mostly women working along with a women-focused and women-driven NGO in a male-dominated society, and generally against the local elite. Hence, the aforementioned factors may diminish the expected impact on PHKN members; nonetheless, determining the degree to which these three factors diminish that impact is left for investigation in future research.

In Chapter 6, the internal validity of the AWBAP results is guaranteed because of its randomized design. However, the external validity of the AWBAP needs to be tested by upscaling and/or replicating the program in different contextual settings. This too is left for future work. The insignificant impact of the AWBAP could be due to its hidden cost to treated households or the household's perception of the transient nature of the intervention. These interpretations need to be empirically tested using the follow-up survey results and other experiments (say, paying monetary incentives to participating households as compensation for labor-income loss). However, the compensation option should be exercised carefully, while bearing in mind the Hawthorne effect of monetary incentives. Apart from this, the main component of the intervention was a human resource development training, I would like to know how the capacity building occurred within the treated households, which is currently in a black box. These are left for further research. I also intend to expand my current dataset to include data from the third round household survey, which will help examine the possibility that the treated households were not convinced with the income loss reduction effect with only one time trial. By doing so, I will also analyze whether the loss reduction thanks to AWBAP measures was sustained in the third year without the PHKN's intervention.

Directions for future research with regard to the speculative findings involve subjecting the findings to further tests, possibly through empirical analysis. One of the possibilities is a comparison between the PHKN (a women-focused and women-driven NGO), and a women-focused and men-driven NGO (and/or a men-focused and men-driven NGO). This will constitute an interesting case that is not possible with the current data; hence, this too is left for future research. In conducting such analysis, controlling for endogeneity in the NGO-formation

process becomes important. Without such control, it is not possible to identify the causal impact of the women-focused or women-driven design on the economic impact.

7.3 Policy Implications

The findings of this dissertation have several policy implications vis-à-vis the CBD approach. In this section, I provide two policy implications relevant to the PHKN, derived from Chapters 4 and 6. Since the findings of Chapter 3 show that PHKN interventions are well-directed, I cannot offer specific recommendations related to that chapter. Since the results of Chapter 5 are not clearly established—for a number of reasons, as discussed in the previous section—I refrain from proposing any recommendation, prior to implementing the future research agenda with respect to the chapter.

According to the findings of Chapter 4, the achieved level of preference-matching has been low, on average. By improving the preference-matching level, more efficient outcomes can be expected. Currently, PHKN collects information regarding household (and/or CO)-level preferences, through public meetings. This may prevent some members from expressing their views or voicing their preferences in the presence of other CO members, thus resulting in low preference-matching. One of the policy recommendations is, therefore, to implement preference surveys of households or members in private domains, prior to the implementation of intervention(s). Furthermore, under the current system, most of the information on preferences is collected during the pre-CO formation stage. Therefore, another recommendation is to update information more frequently through the execution of preference surveys. These suggestions might be helpful in improving preference-matching overall.

As discussed in the results of Chapter 6, the AWBAP has had a statistically insignificant welfare impact, which might be due to an implicit cost associated with participation into the program. Therefore, the implicit cost issue should be addressed by offering monetary incentives to the participating households, as compensation for labor-income loss. However, the compensation option should be used carefully while bearing in mind the Hawthorne effect, which often accompanies monetary incentives.

The results of the whole of this dissertation appear to suggest that the inclusion of women in project design and management can greatly improve the outcome(s) of CBD interventions.[138]

[138] This is contingent on favorable results from the future empirical task of establishing a causal impact between a women-focused or women-driven design and the economic impact (see the previous section). The following statement is valid only when such a causal impact exists.

Therefore, a policy recommendation for the federal government of Pakistan, the provincial government of KPK, and related donor agencies could be to encourage women's participation in grass-root level development. This goal can be achieved by compelling the NGOs that follow the CBD approach to ensure a minimal presence of women, in terms of both management and beneficiaries. This policy should be tied to current and future funding or subsidies. To sustain women's participation, future funding to NGOs should be conditional on the further attainment of a minimal level of women's participation, over and above a threshold level relating to the past recipients of funds/subsidies. These measures are expected to have a long-lasting impact on women's empowerment and the achievement of better outcomes vis-à-vis CBD activities, and foster women's leadership at the grass-root level. These measures will also improve women's participation in the Pakistani labor market—something that is quite low presently, at both the regional and national levels.

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