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Make the Village Better:  
An Evaluation of the Saemaul Zero Hunger  
Communities Project  
in Tanzania and Bangladesh

박복영

**Make the Village Better:  
An Evaluation of the Saemaul Zero Hunger Communities Project  
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## Abstract

The Saemaul Zero Hunger Communities Project (SZHCP) in Tanzania and Bangladesh was a World Food Programme project implemented by Good Neighbors International, a South Korean non-governmental organization, in partnership with Tanzanian and Bangladesh local governments, which ran from 2014 to 2018. The project targeted the most vulnerable communities to facilitate their sustainable development in terms of food security, income generation, education, and infrastructure improvement through community-based activities. This study aims to evaluate whether the project produced the intended outcomes. We conducted field research in target villages of the SZHCP in Tanzania and Bangladesh and evaluated projects using in-depth interviews, focus group interviews, and surveys with beneficiaries, non-beneficiaries, and stakeholders. Using qualitative analysis, difference-in-difference estimation, and linear regression on surveys of 1,142 respondents, we show that the SZHCP significantly improved the livelihoods of beneficiaries in relation to zero hunger, as well as increased income generation and promoted positive social changes. It has also helped to strengthen the capacity of communities to run development projects themselves. This study provides evidence-based analysis that could allow stakeholders and researchers to more fully engage with future community-based projects.

Keywords: World Food Programme, Good Neighbors International, Community-based projects, Sustainable development, Zero hunger

### Highlights:

- The Saemaul Zero Hunger Communities Project (SZHCP) in Tanzania and Bangladesh is evaluated to determine if expected outcomes were attained.
- Qualitative analysis, difference-in-difference estimation, and linear regression of surveys involving 1,142 respondents were conducted.
- The SZHCP delivered improved food security, income generation, education, and infrastructure through community-based activities.
- The SZHCP is an effective model for achieving zero hunger goals and strengthening communities' capacity to run development projects themselves.

## Introduction

The United Nations has worked on achieving zero hunger and the eradication of extreme poverty, in particular following the launch of the Zero Hunger Challenge by United Nations Secretary-General Ban Ki-moon in 2012. This project was intended to help end world hunger, eliminate all forms of malnutrition, and build inclusive and sustainable food systems. Even though the socioeconomic conditions of developing countries have improved over recent decades, many people are still suffering from hunger and have a minimal income. At the macro level, while a significant amount of official development assistance (ODA) has been distributed, challenges remain for greater improvement. Critics have claimed that ODA from developed countries to developing countries has made things worse (Easterly and Easterly 2006). At the micro level, interventions from outside into many non-Western contexts employing Western concepts and cultural assumptions have often failed to bring substantive change into local people's lives. This is partly because most development projects have not proved sustainable due to the utilization of simple one-off project implementations without any follow-up project. To address this issue, international organizations (IOs) and non-governmental organizations (NGOs) in the field of international development cooperation have started to pay more attention to community-based development (CBD) projects.

CBD and its derivatives involving community-driven development (CDD) are currently among the fastest-growing concepts in rural development. Recently, local and community-driven development has appeared as a further alternative approach that can achieve goals beyond income growth in promoting good community-level governance and sustainable development (OECD 2016). Recognizing that development projects are often implemented in a top-down manner by policy makers who are separated from local communities, the CBD approach has been used since the 1950s in an attempt to stimulate local participation in the decision-making processes of community development practices (White 1999; Mansuri and Rao 2004). CBD projects basically provide resources to increase local public goods and encourage local participation through allowing local voices to be heard and permitting greater local control over the use of resources.

This study aims to evaluate whether the Saemaul Zero Hunger Communities Project (SZHCP) in Tanzania and Bangladesh produced these intended outcomes, using qualitative and quantitative methods. The SZHCP was a World Food Programme (WFP) CBD project implemented between 2014 and 2018 by Good Neighbors International (GNI), one of the largest South Korean NGOs, in partnership with Tanzanian and Bangladesh local governments, and funded by the South Korean government at US\$5 million for Tanzania and US\$3 million for Bangladesh. The project targeted the most vulnerable communities in Tanzania and Bangladesh to promote their sustainable development in terms of food security, income generation, infrastructure, and education through community-based activities. While Tanzania and Bangladesh do not really share any social or political characteristics, we deal with the SZHCP in both countries in this study because the SZHCP in both countries started around the same time with similar plans and budget.

While the SZHCP shares the general attributes of NGO development projects, it also has three unique characteristics. First, it is a community-based project implemented by a South Korean NGO applying the concept of *Saemaul Undong* that was initiated in South Korea during the early 1970s.<sup>1</sup> The concept involves an inclusive approach to rural development, targeting improvement

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<sup>1</sup> *Saemaul Undong* can be translated as “new village movement.” This Korean term is widely used in many studies (see Park 2009).

across differing community and individual household levels through building community's common assets and increasing individual household income. The effective implementation of *Saemaul Undong* has been considered one of the principal reasons why rural areas in South Korea were able to develop rapidly (Park 2009; Douglass 2013). Examining the SZHCP is likely to be worthwhile because the project involves development experiences from South Korea, which transitioned from being one of the poorest countries in the world to a donor country.

Second, this project was designed to promote sustainable development through community involvement. Even though the major implementation was conducted by an NGO, the target communities played a key role in the project and were involved in almost all project activities. Differing from many development projects in which the role of target communities has been somewhat passive and limited, this project has allowed local people to actively work for change in their own lives. For example, although GNI installed boreholes in target villages, a local water committee makes the main decisions regarding the use and maintenance of the boreholes.<sup>2</sup> As most activities are mainly managed by local people, it is possible for target communities to continue conducting income generating activity (IGA), maintaining their infrastructure, and making development progress even after the SZHCP has ended.

Third, the partnerships involved in this project comprised various actors such as a donor country, an IO, an NGO, and local governments. The government of South Korea was willing to provide multi-bi funds for the project, and the WFP identified the implementing partners and target villages. GNI as an implementing partner is specialized in CBD, especially *Saemaul Undong*, and had worked closely with local governments. All these actors worked closely together to make this project happen, and the resulting partnership appears to have operated with considerable transparency, accountability, and efficacy.

Due to these unique features, an analysis and evaluation of the project is likely to be valuable for planning future development projects and enhancing academic knowledge in this area, as well as ensuring a degree of novelty for this paper in relation to two further aspects. First, this paper focuses on the effects of external intervention by an NGO in the provision of food aid, income generating activities, and improved social and economic infrastructure delivered together and combined with CBD programs. This paper will show that these packaged projects seem to produce synergies that contribute to the better outcome of the project.

Second, this study used both qualitative and quantitative methods to evaluate the project. Many project evaluations are conducted using descriptive assessment involving anecdotal evidence or satisfaction surveys. As well as in-depth interviews with the main stakeholders and focus group interviews with beneficiaries and non-beneficiaries, we used difference-in-difference (DID), a quasi-experimental method, the ordinary least squares (OLS), and ordered logit method to analyze a survey of 1,142 respondents. By including non-beneficiaries as a comparison group, we also attempted to better understand the actual impact of the project.

The results from in-depth interviews, focus group interviews, DID estimation, and OLS regression show that the SZHCP significantly improved the livelihoods of beneficiaries regarding food security, increased income generation, and promoted positive social changes. It also helped to strengthen the capacity of communities to run development projects themselves. Beneficiaries of the project have been able to escape from the ongoing prospect of hunger because of increased incomes.

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<sup>2</sup> A water committee was voluntarily organized by local people with the help of Good Neighbors.

Water for drinking, farming, and livestock has become accessible with minimum cost and time needed to obtain it. Moreover, the children of beneficiaries can attend primary school after the project.

This paper consists of five sections. Following this introduction, the second section provides a literature review on studies concerning community-based projects and projects to ensure food security, income growth, and positive social changes. The third section explains the project in detail and the methodology used in this study. The results of in-depth interviews, focus group interviews, DID analysis, and survey analysis are shown in the fourth section. The last section concludes by summarizing the findings and drawing out the implications of the study.

## **A Literature Review of Development Project Evaluations**

### **Research on CBD Projects**

Beginning from the 2000s, CBD and CDD have served as important pillars for the comprehensive development framework promoted by the World Bank and the International Monetary Fund. CBD sets its objectives as enhancing sustainability, efficiency, effectiveness, governance, scaling-up, and mutual complementarity between public and private actors in the development process (Saraceno 2014). CBD aims to provide communities with decision-making power in the development process and control of resources. The underlying assumption of CBD is that local people in the community might be the best candidates for promoting improvements in their livelihoods and organizing to meet imminent needs, if adequate resources and information could be provided. Thus, CBD involves supplying development funds directly to communities, which then decide how to use it and are responsible for planning, implementing, and monitoring community projects (World Bank 2010).

Most research on CBD has revealed that it can enhance a community's capacity to provide public goods collectively in a localized way (Fearon, Humphreys, and Weinstein 2015; Avdeenko and Gilligan 2015). CBD advocates have claimed that its participatory approach is effective to achieve objectives with external resources from aid agencies. By engaging communities in resource mobilization and decision-making about resource allocation, CBD is expected to expand resources for the projects concerned and efficiently utilize them according to the priorities of communities (Chambers 1983; Ostrom 1996).

However, despite its growing appeal among rural development practitioners, CBD suffers from some drawbacks such as inefficiencies due to elite domination, discord over incentives among stakeholders, lack of accountability, and limited capacity development. In addition, local knowledge is occasionally represented by local power groups, so CBD is sometimes implemented in inappropriate ways and does not reflect gender equity (Mansuri and Rao 2004). Some skeptics have pointed out the possibility of capture and reduced capacity when local people take a lead in development projects (Khwaja 2004; Bardhan and Mookherjee 2006). Indeed, the effectiveness of CBD in achieving project outcomes is still being debated (Mansuri and Rao 2012). Given this context and as one type of CBD, the effectiveness of the SZHCP is explored in this paper to better understand its potential contribution to community development.

### **Research on Projects for Food Security**

As the SZHCP is designed to address food security as a priority, it is necessary to understand

how other studies have analyzed development projects focused on food security. Food aid is one of the oldest types of foreign aid, but its effectiveness remains controversial. Some observers have claimed that food aid has been an ineffective means to improve food security among recipients (Clay et al. 1996; McClelland 1998). Negative views are mainly found in relation to program food aid operating at a macro level. This type of program food aid is usually provided to alleviate balance of payment difficulties or issues arising due to a shortage of foreign currency in recipient economies. However, many studies contend that this type of food aid has had no significant positive effect on hunger or poverty reduction among recipients but rather has created disincentives for recipient agricultural economies through weakening local food supplies and markets (Schultz 1960; Maxwell and Singer 1979).

In contrast, other studies have shown that food aid creates positive effects for beneficiaries in terms of food security, nutrition status, income, and other living conditions (Bezuneh et al. 1988; Holden et al. 2006). This positive views are from the studies of project food aid. Project food aid is primarily provided on a grant basis for food security or specific social or economic development goals (for example, food-for-work (FFW) and food-for-training programs). That is, project food aid directly targets the poor suffering from food shortages or malnutrition.

Quantitative studies on the effects of food aid are scarce. As Awokuse (2011) notes, most discussions of food aid have been descriptive in nature. Until the 1990s, even the limited number of quantitative studies primarily involved a macro- or country-level analysis. Bezuneh et al. (1988), an early quantitative study on food aid, estimated the effects of FFW and cash-for-work (CFW) programs delivered by the WFP. Using a linear programming model, they predicted that these programs would have a positive impact on income and agro-production in rural Kenya. Their analysis is a simulation based on a theoretical model and does not estimate the actual effects of the programs. Holden et al. (2006) also conducted a simulation of the effects of FFW using a more advanced theoretical model, that is, a dynamic household model, to assess economic optimization. They predicted that FFW programs in northern Ethiopia would produce a crowding-in effect on private investment. Moreover, there have been qualitative studies on the effects of FFW, which have concluded that FFW programs in South Sudan had little positive effects because of technical and administrative issues (see Pantuliano et al. 2007).

Doocy et al. (2006), an early example of estimation at the household level, examined the effects of CFW after a tsunami in Aceh, Indonesia. They find that CFW produced positive effects on the expansion of community infrastructure, household income, savings, and assets. However, that study did not use an experimental approach but simply compared performances before and after the program. Bezu and Holden (2008) find that FFW in Ethiopia has a positive effect on increased use of fertilizer, using household data. To deal with selection bias, they applied a Heckman selection model rather than a more robust experimental approach.

An early and comprehensive study using more rigorous experimental methods to assess the effects of food aid was conducted by Ahmed et al. (2009). They analyzed the effects of food aid on the welfare of households in Bangladesh and compared the effects among four types of food aid: IGA, food security, Food Assistance for Assets (FFA), and rural maintenance programs. Their empirical results show that IGA and food security programs were more cost effective than FFA and rural maintenance programs for income growth and poverty reduction. For the analysis, they used propensity score matching (PSM), a quasi-experimental method. More recently, Rawat et al. (2014) estimated the effects of food aid for HIV-infected people in Uganda and report a positive effect on nutritional status and food security.

In summary, there are few empirical studies on the effects of food aid, especially those using experimental or quasi-experimental methods. This study used the DID method, a quasi-experimental method, to compare the difference before and after intervention for the treatment and control groups.

#### Research on Projects Promoting Income Generating Activities and Positive Social Changes

There have been numerous studies attempting to analyze the effects of NGO-related IGA. Many of them have concluded that IGA projects in several developing countries have created positive effects on income growth among the project beneficiaries (see Winters 2009; Chhay 2011; Mahmud et al. 2017; Geleta et al. 2018). Nonetheless, it is also true that these studies do not present empirical evidence to show that IGA has produced the intended outcomes, nor any analysis regarding to what extent IGA interventions increase total income for the participating individuals, groups, and communities, and how differently men and women benefit from IGA. Moreover, there has been a debate as to whether direct cash transfers to the poor might be better than the implementation of IGA projects (see Kapur et al. 2008; Shah 2008).

Davis et al. (2010) present an empirical analysis of rural IGA using a cross-country database derived from multipurpose household surveys. While they do not specify whether NGO-related IGA is involved, their findings provide some evidence on whether and how IGA can make a positive impact on household income. According to them, the largest share of income stems from off-farm activities, and the largest share of households have diversified sources of income.

Specific IGAs in various countries have been evaluated and analyzed using varying methods. Through adopting qualitative methods, Gibson (1993) assesses IGA projects in Zimbabwe and Kenya, providing some recommendations for NGOs and donors. He claims that NGOs should adopt a more businesslike operation without losing their original purpose and goals. In addition, NGOs need to work towards implementing a more credible project planning process for better outcomes. Geleta et al. (2018) evaluated a pulse innovation project for food and nutrition security in southern Ethiopia, with 70,000 farm households involved. Their evaluation was conducted using in-depth interviews, observation, six focus group discussions with women (n=45) and men (n=45) from 15 rural districts. From this evaluation, they conclude that the project had been successful in increasing the income of participants, especially female participants. A study by Chun and Watanabe (2012), evaluating a project in Bhutan, also utilized household survey data, comprising 320 participants and 451 non-participants. That study finds that IGA helps to diversify income sources to areas other than agriculture, but that the impact is limited.

Among the many different kinds of IGAs, microfinance is one of the most studied aspects. With the success of Grameen Bank and Bank Raykat Indonesia, microfinance became popular during the 1980s, and the 1990s, which have been referred to as “the microfinance decades” (Dichter 1997). Despite extensive applications of microfinance around the world, it remains controversial whether microfinance has positive effects. Many studies have found that the impact of microfinance has been equivocal and uneven, ranging from positive to negligible and even having a negative impact (see Remenyi 1991; Pitt and Khandker 1998; Khandker 2005; Maldonado and González-Vega 2008; Bateman and Chang 2012). Overall, studies have shown that the impact of microfinance on income growth for beneficiaries depends on the local context. In addition, any positive effect is subject to multiple factors such as varying household and individual characteristics, the degree of social capital, levels of enterprise activities, attitudes to debt, financial literacy, and service providers.

Income growth has a positive impact on social change for local people, especially education.

With increased income, people do not need to be so concerned about how to obtain food and can begin to think more widely about their future, which leads to investment in their children's education. Considerable research has shown that improved household economic conditions due to increased income have a direct positive impact on higher enrollment rates at schools or decreased dropout rates (Flug et al. 1998; Grimm 2011; Gyimah-Brempong and Asiedu 2015). This paper focuses on the impact of the SZHCP in relation to food security, income generation, and social changes including education, using methods identified in previous studies as likely to be more rigorous and applying a specific theoretical understanding of project evaluation, to evaluate whether the SZHCP has achieved its intended outcomes.

## **Project Description and Methodology**

### **An Overall Description of the SZHCP**

SZHCP pilot projects were first launched in Nepal and Rwanda in 2011 under a memorandum of understanding between the Ministry of Foreign Affairs and Trade in South Korea and the WFP. In 2013, the expansion of these pilot projects into two additional countries, Bangladesh and Tanzania under a new project name, the Saemaul Zero Hunger Communities Project, was agreed to. The SZHCP combines the WFP's Zero Hunger Program with experience gained from South Korea's previous rural development initiative *Saemaul Undong*. As noted, *Saemaul Undong* contributed to the development of rural areas in South Korea.

### **The SZHCP in Tanzania**

In Tanzania, the project started in Chamwino district, Dodoma region, in 2014, in partnership with Good Neighbors Tanzania (GNTZ) and the Chamwino District Council at the field level. In 2011, the WFP carried out a Local Level Participatory Planning Approach (LLPPA) assessment in the Chamwino district, which was chosen based on the local communities' low income and food insecurity levels, coupled with the region being badly affected by drought and deteriorating food production capacities, and this provided grounds for further studies and more in-depth analysis of the target villages. The main target villages in Chamwino district for this project were Fufu, Suli, and Chiboli, covering a population of 12,280 people (2,456 households). These villages were among the most vulnerable villages and households in terms of food security and extreme poverty. Through workshops in which the WFP in Tanzania, GNTZ, the Korea International Cooperation Agency, and Chamwino District Council officials participated, the LLPPA and field visit results were expanded upon and draft proposals set out for possible SZHCP activities.

The SZHCP in Tanzania was designed to assist vulnerable communities with limited access to food, basic resources, and social infrastructure. The project included the following key activities: (i) constructing and rehabilitating community assets and water sources such as boreholes; (ii) building and rehabilitating physical public infrastructure such as primary schools; (iii) building community leadership and capacity among respective villagers through community-based activities, and; (iv) building IGAs such as raising livestock, beekeeping, developing brick-making factories, village saving schemes, and loan associations.

### **The SZHCP in Bangladesh**

From January 2014 through June 2017, the WFP in partnership with Good Neighbors Bangladesh (GNB) carried out a community-based hunger-reduction program in rural areas of Bangladesh. The SZHCP was implemented in 22 villages of the Nalka union of Raiganj Upazila in the Sirajganj district, which were selected based on the prevalence of poverty and its vulnerability to disasters, as well as a need to improve existing infrastructure and essential services. In addition, the motivation and enthusiasm of the community members to participate in the project was taken into account. The project targeted 1,800 participants as direct beneficiaries from the most vulnerable families.

The SZHCP in Bangladesh incorporated four key activities. The first was a food-and-cash-for-work (FCfW) initiative to build disaster-resilient community infrastructure. This included constructing or repairing embankments-cum-roads or access roads, raising homestead or school ground levels, and constructing flood shelters. Female and male beneficiaries selected from extremely poor households participated in these activities during the dry season (January to June).<sup>3</sup> The second activity was a food-and-cash-for-training (FCfT) initiative to develop participant capacities. During the wet season, the participants engaged in a series of training sessions that covered disaster risk reduction, women's empowerment, nutrition, and IGA skills.<sup>4</sup> The third activity involved a cash grant for IGA and a monthly allowance for consumption support. At the beginning of 2016, women participants received a one-off cash grant of 14,000 Bangladeshi Taka (BDT), which was invested in IGA such as bull fattening, weaving, fruit and vegetable gardening, poultry rearing, or a small trade. To support household consumption during the investment and reinvestment phases, a monthly allowance of 500 BDT was provided to the IGA participants for one year. The last activity comprised a range of community development endeavors guided with the *Saemaul Undong* approach, which included environmental improvement, water and sanitation improvement, and social infrastructure development.

## Methods and Selections

To evaluate the effects of the SZHCP, this study adopted both qualitative and quantitative methods. As qualitative methods, we used field inspections, in-depth interviews, and focus group interviews. Through these methods, we first identified whether the project had been implemented as proposed. Since the project was supposed to deliver tangible and intangible outputs, such as boreholes, schools, community centers, and community-based committees, we checked whether these have been actually installed or implemented. In addition, in-depth interviews with various stakeholders, including governmental officials, directors, and staff of the WFP and GNI in South Korea, Tanzania, and Bangladesh provided a deeper understanding of the project. Focus group interviews were conducted with beneficiaries, non-beneficiaries, and local government officials. The results obtained from the qualitative methods were used to supplement our quantitative research to ensure a more objective overall assessment of the effects of the projects.

As quantitative methods, we adopted the DID, OLS, and ordered logit for survey analysis.

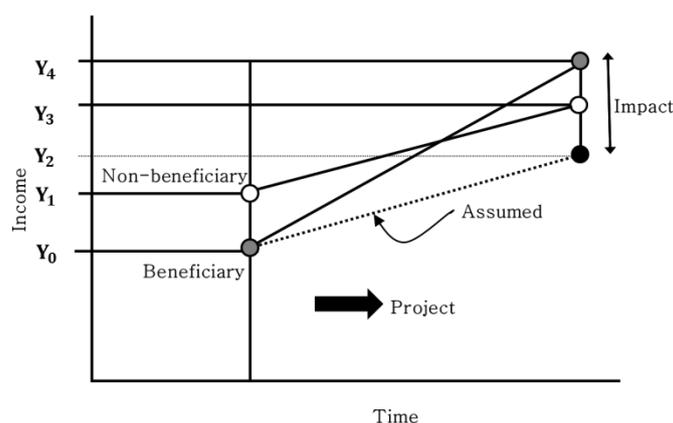
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<sup>3</sup> Each participant received 2 kg rice, 200 g yellow split peas, 100 g oil, and Bangladeshi Taka (BDT) 58 for the filling in of 1 cubic meter of soil in building infrastructure schemes.

<sup>4</sup> While undertaking FCfT sessions, each participant received 22.5 kg rice and BDT 652.50 per month as a training allowance.

One of the most rigorous methods for evaluating effects is the randomized controlled trial (RCT) method because it can resolve endogeneity issues related to selection bias or omitted variables. However, the RCT method could not be used for this project since it was not initially designed in a random manner. Among alternative quasi-experimental methods, the regression discontinuity model is also undesirable because eligibility is not set as a single quantitative criterion, nor is the PSM method desirable because of the high homogeneity of sample households and the limited number of non-beneficiary samples.

As a quasi-experimental method used in social science, the DID method is widely used (Slaughter 2001; Donald and Lang 2007). The DID method estimates the effect of a program by comparing beneficiaries and non-beneficiaries before and after the intervention or program. That is, the effect is calculated as the difference between the observed mean outcomes for the treatment and control groups before and after a program intervention. One can estimate the effects through assuming that unobserved heterogeneity is time invariant and uncorrelated with the treatment over time. In Figure 1, the DID estimate equals  $(Y_4 - Y_0) - (Y_3 - Y_1)$ . The lower dotted line depicts the true counterfactual outcomes, which are not observed. Under the assumption of the DID approach that unobserved characteristics creating a gap between measured control outcomes and counterfactual outcomes are time invariant, the gap between the two trends is the same over the period, that is,  $(Y_3 - Y_2) = (Y_1 - Y_0)$ . Using this equality, one obtains the DID estimate to equal the theoretical effect,  $(Y_4 - Y_2)$ .



<Figure 1> DID Estimation

In this evaluation, a stochastic homogeneity cannot be obtained between treatment and control groups, which would be expected from an RCT-designed program. However, we deliberately constructed the control group so as to increase the degree of homogeneity, because high homogeneity can reduce possible bias from observed or unobserved heterogeneity among the characteristics included. First, for the control group, we chose villages where there had been no intervention concerning food security, disaster resilience, or income generation by the government or NGOs during the SZHCP implementation period. Second, we selected villages for the control group whose socioeconomic and geographical conditions were closely similar to those of the program villages. For instance, villages adjacent to a main road or a major town were excluded from being candidate control villages, since the characteristics of households and major economic activities in such villages may be very different from those in the program villages. Consequently, villages at similar distances from a main road and at similar risks to natural disasters such as floods were selected as control villages.

Third, to obtain similar conditions at the household level, we limited the control group to households that replicate the eligibility criteria for the program group. If a household in a control village violated even one of the criteria, it was excluded from the survey.

The SZHCP in Tanzania targeted three villages, Fufu, Suli, and Chiboli, in the Chamwino district of the Dodoma region. The present study's survey in Tanzania was conducted from April to June in 2018 with 512 households. Out of 512 households, 332 households were from the three beneficiary villages and 180 from three non-beneficiary villages, Loje, Ilewelo, and Sasajila, which were selected using the criteria explained before. In Bangladesh, the project was implemented in Nalka union. There are nine wards in Nalka union comprising 42 villages. Out of these, the project was implemented in 22 villages. The present study's survey of beneficiaries was conducted with 420 households comprising 1,800 beneficiaries in these target villages. After control groups were selected using the criteria explained before, the survey for non-beneficiaries was conducted with 210 households from three other wards. The face-to-face survey was undertaken from February to March 2018 by trained enumerators.

Each respondent provided answers to questions concerning basic background, food security, income, education, and activities in relation to the projects.<sup>5</sup> The survey questionnaires included a wide range of questions regarding the economic and social conditions of the participants before and after the projects.<sup>6</sup> More specific questions used in this study are discussed in the next section. It needs to be noted that baseline data were also collected through a post-program survey relying on the memory of respondents, which risked some degree of inaccuracy recalling events before 2014.<sup>7</sup>

## **Results from Empirical Analyses**

### **An Empirical Analysis of the Effects of the SZHCP in Tanzania**

To evaluate whether the SZHCP achieved the most important goal of the project, zero hunger, we asked how many times householders from beneficiary and non-beneficiary villages ate meals per day before and after the project, between 2014 and 2018. From the results of DID shown in Table 1, it appears that the project significantly improved the situation in terms of hunger. While non-beneficiaries (the control group) ate 1.917 times per day on average before SZHCP was implemented, beneficiaries (the treatment group) ate 1.795 times per day on average. The situation of beneficiaries was worse than that of non-beneficiaries in 2014 because the WFP chose villages in the most challenging situations in terms of hunger. Before the project, non-beneficiaries ate 1.917 times per day on average, and beneficiaries ate 1.795 times per day on average. Our DID calculations show that the project brought about improvement for the beneficiaries, allowing them to eat 0.372 times more often per day on average in 2018 compared to 2014.

In Table 2, the results from OLS also show that, for the beneficiary variable, there was a significantly positive influence concerning the number of meals consumed per day, which implies that the project had a positive impact on helping to achieve zero hunger. In addition, from other survey questions concerning whether the project had helped feed the children of beneficiaries, 254 families

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<sup>5</sup> This study was approved by the Institutional Review Board at the researchers' university (KHSIRB-18-064(EA)). Each respondent was informed of the purpose of the survey.

<sup>6</sup> The complete questionnaires used in the survey can be shared upon request.

<sup>7</sup> This limitation of the empirical studies is addressed in the Conclusion section.

out of 332 answered that the project had substantially helped householders to feed their children. Interestingly, it seems that the other control variables, such as the age of the head householder, whether the head householder was male or a single female or literate, the number in a household, and the amount of the Tanzania Social Action Fund (TASAF) did not statistically influence the change in meals consumed per day.<sup>8</sup>

<Table 1>

<Table 2>

IGA was also a critical element of the project. Table 3 shows the results of DID analysis in terms of changes in average income per month. Before the project started, there was clearly a significant difference in the average income per month between beneficiaries and non-beneficiaries, namely, 43,000 Tanzanian shillings (TZS) and 78,000 TZS, respectively.<sup>9</sup> This difference in income was again due to the selection of beneficiaries because the WFP chose the most vulnerable villages as targets. While the income of the non-beneficiaries was almost twice as high as that of the beneficiaries before the project, this difference reduced substantially after the project, with a difference of only 20,000 TZS between the two groups in 2018. Even though the DID results may not seem significant statistically, the change in income between two groups in terms of the amount of income shows that the project increased the income of beneficiaries. In time, the income of beneficiaries might have increased to some extent without the project. Nonetheless, there is little likelihood that the average income of the beneficiary villages would have increased to the extent that it did without the project.

With the DID results, we ran OLS using the dependent variable of the income change between 2014 and 2018. Reflecting that income was measured in TZS, which underwent a decline in value over the period, income change tended to vary significantly from zero. Thus, we used the logged amount of income per month in 2014 and in 2018 and calculated the difference between two. The impact of the project on income change showed relatively mixed results. As shown in Table 4, the variable, beneficiaries, in Model 1 is not significant, but in Model 2, this variable does show statistical significance when we controlled for the villages.

This outcome might be because the results of IGA vary according to villages. Depending on local governance, locations, and pre-infrastructure, IGA seems to produce different effects. In addition, the level of project engagement differed among the three target villages, as was revealed in focus group interviews that showed that villagers from Suli were much more enthusiastic than villagers from Fufu and Chiboli. Moreover, local governance in Suli village was much stronger than in the other two beneficiary villages. Therefore, when GNTZ implemented the project, it was possible to observe differing levels of ownership and cooperation.<sup>10</sup>

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<sup>8</sup> TASAF is provided to households with the lowest income level. The amount of TASAF can vary depending on several conditions. As it can actually influence the income level, the amount of TASAF is included as a control variable. Detailed information of TASAF can be found at its official website ([www.tasaf.go.tz](http://www.tasaf.go.tz))

<sup>9</sup> On December 31, 2014, US\$1 was equivalent to 1,735 TZS, and on June 30, 2018, US\$1 was equivalent to 2,274 TZS. Thus, the average incomes per month of the beneficiaries and non-beneficiaries were about US\$24.7 and US\$44.9, respectively. If we consider the fact that the Tanzanian shilling has weakened over the last four years, the difference of income might appear not be as big as set out in our study. However, the change remains significant even when the exchange rate is taken into account.

<sup>10</sup> This is also supported in an interview with the regional director of GNTZ in Dodoma, who was in charge of

<Table 3>

<Table 4>

In addition to the effects of the project on hunger and income generation, we assessed how the project changed the lives of beneficiaries in terms of water access and education. Before the project was implemented, people in beneficiary villages would spend approximately two hours on average a day obtaining drinking water as the water sources were far away. Models 1 and 2 in Table 5 show that the time needed to access drinking water shows a statistically significant decrease for beneficiaries compared to non-beneficiaries because, once the project had installed automated boreholes in beneficiary villages, people could directly access drinking water. From our focus group interviews, we could appreciate how much the villagers preferred to have water sources inside their villages, as indicated by one interviewee:

*Water is life. After the borehole was installed in our village, our lives have changed dramatically. We do not need to waste hours walking to get drinking water. As adults go out for work, many young children had to get drinking water. They do not need to do it anymore. In addition, water from our borehole is clean and trustworthy. We do not need to worry about getting sick because of water anymore.*

Models 3 and 4 in Table 5 show how the project has influenced student dropout rates in primary schools. Due to extreme poverty in the beneficiary villages, children could not go to school or they had to drop out of primary school even if they had managed to start going to school. From our empirical analysis, it was clear that being a project beneficiary village helped decrease significantly the primary school dropout rate. This positive effect operated in two ways. First, as the project built schools in beneficiary villages, the educational environment improved, so fewer students needed to drop out of primary schools. Second, because there was less worry about being hungry with a small amount of income, people in these villages could now send their children to primary school, which provided basic education. People can now work for a better future to further overcome the effects of extreme poverty. As noted, this latter situation is one of the better outcomes that this project has achieved.

<Table 5>

#### An Empirical Analysis of the Effects of the SZHCP in Bangladesh

The SZHCP in Bangladesh was expected to have similar effects to the SZHCP in Tanzania. While the SZHCP in Bangladesh shared most aspects of the SZHCP in Tanzania, it emphasized more the role of women and improvements in relation to flood risk. Using the same methods as for the SZHCP in Tanzania, we examined the effects of the project in Bangladesh to assess the nature and extent of any changes.

As the project in Bangladesh also attempted to achieve zero hunger, GNB implemented

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the implementation of the project in the beneficiary villages.

various zero hunger-related activities. The results of DID in Table 6 show that meals consumed per day for beneficiaries had statistically significantly increased over the last four years. Before the project was implemented, villagers in beneficiary villages ate less than 2.45 times per day on average whereas, after the project, they ate almost three times per day on average. Compared to the control group, the increase, by 0.193 times, of meals consumed per day was statistically significant. The results of OLS in Table 7 for Models 1 and 2 are statistically significant, indicating that the project had a positive impact on achieving the zero hunger goal through providing opportunities for beneficiaries to access better nutrition.<sup>11</sup>

<Table 6>

<Table 7>

Tables 8 and 9 show the results of DID and OLS regarding changes in income. DID was used to assess the amount of income obtained per month by beneficiaries and non-beneficiaries. While the WFP had targeted the most vulnerable villages in Bangladesh as it had in Tanzania, the income of beneficiaries was higher than that of non-beneficiaries in this case. The reason is that the WFP also targeted people who were in danger of floods, which meant the villages involved may not necessarily have been the poorest villages. The income of beneficiaries was 3,280 BDT in 2014 and increased to 5,665 BDT in 2018, which represents an increase of approximately 73% in income per month.<sup>12</sup> Over the same period, the income of non-beneficiaries changed from 2,399 BDT to 3,036 BDT, representing only a 26% increase in comparison. The results of OLS in Table 9 also show that the project had a positive statistically significant effect on income change.

<Table 8>

<Table 9>

From our focus group interviews, it appeared that the beneficiaries were very satisfied with the project and that they had all actively participated in the project,<sup>13</sup> as indicated below by one beneficiary:

*We are all satisfied by the project. Whoever participated in the project cannot deny that the project has changed our lives significantly. Before the project was implemented, we had experienced extreme poverty. People simply were not able to eat well, and many people suffered from malnutrition. Once the project began, people started to eat well and earn more money. Some people even became rich. Even non-participants in our villages have learned from participants about how to earn more*

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<sup>11</sup> Model 2 in Tables 7 and 9 controls for the location of beneficiaries and non-beneficiaries according to village wards. We have nine wards for beneficiaries as well as three other wards for non-beneficiaries, so 12 wards are controlled. Ward 7 involving beneficiaries and Ward 12 involving non-beneficiaries were omitted for the base comparison.

<sup>12</sup> On June 30, 2018, US\$1 was equivalent to 0.012 BDT and on December 31, 2014, it was 0.013 BDT. Thus, the average income of beneficiaries in 2014 was US\$42.64, and in 2018, it was US\$67.51.

<sup>13</sup> This is supported in an in-depth interview with the regional director of GNB, who was in charge of the project.

*money through income generating activities. We hope that the project may continue here longer. In that way, we will be better off.*

Similar to the SZHCP in Tanzania, GNB installed a tube well for drinking water. As Model 1 shows, the time needed to access drinking water significantly decreased for beneficiaries. In contrast to the SZHCP in Tanzania, the SZHCP in Bangladesh undertook major constructions for the management of flood risk. The target villages had almost always been exposed to the risk of flooding in the rainy season. Whatever efforts they made previously to improve their lives, flooding would tend to result in major setbacks. Because of constructions to prevent flooding in the beneficiary villages, the risk of flooding in homes and on roads significantly decreased, as shown in Models 2 and 3 in Table 10.<sup>14</sup> This outcome provides greater stability and prosperity for people in these villages since they now do not need to worry about losing everything due to flooding. Model 4 in Table 10 shows that the project also contributed to improving the education of beneficiaries, as occurred in Tanzania. Since we did not have the dropout rate at primary school here, we investigated how many days primary school students missed school, and our results show that primary school students in beneficiary villages were less likely to miss school compared to students in non-beneficiary villages.

<Table 10>

Based on our evaluations in the field, the SZHCP in both Tanzania and Bangladesh produced the intended project outputs. GNTZ and GNB implemented all the intended elements of the projects, such as providing or building automated boreholes, water-tubes, primary schools, water reservoirs, IGA, and community-based committees. In addition, we evaluated whether the projects brought positive changes in food security, income, water access, physical resilience from natural disaster, and education using in-depth interviews, focus group interviews, and surveys. The results strongly indicate that the projects achieved their intended outcomes in both countries, with beneficiaries now enjoying food security, higher income, clean water, better education, and a safer environment. In addition, as most project elements in both countries required the participation of villagers in committees for effective operation (in water committees, for example), the participants had higher levels of ownership and engagement within the projects and greater understanding of CBD projects. These outcomes are likely to promote project sustainability. Even if or when a foreign implementing partner, such as GNI in this case, ceases to appear in a village, villagers now know how to continue their projects through community committees, and this is already happening in Bangladesh, as GNB withdraws from the beneficiary villages of Bangladesh and local people run projects themselves through established committees.<sup>15</sup>

## **Conclusion**

The WFP is specialized in handling food crises around the world, targeting the most

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<sup>14</sup> We used an ordered logit for Models 2 and 3 since the dependent variables in these models were the levels of flood risk. It was ordered as follows: risk mitigated significantly=1; risk mitigated somewhat=2; same as usual=3; risk increased somewhat=4, and; risk increased significantly=5.

<sup>15</sup> GNTZ is still working in beneficiary villages at the time of writing due to the extension of the project period and the construction of a dam.

vulnerable people. In contrast to most projects of the WFP that focus on achieving zero hunger, the SZHCP in Tanzania and Bangladesh focused on the sustainable development of villages in addition to food security. Following the concrete achievements of the SZHCP in four countries, the WFP now has a new model for addressing both food security and long-term development. Moreover, as implemented by GNI, whose specialty is CBD using the concept of *Saemaul Undong*, the SZHCP has mobilized and developed community-centered activities. Through the SZHCP, the WFP and GNI have attempted to develop sustainable methods for community development. Furthermore, funding from the South Korean government through multi-bi funds has enabled the WFP to conduct the SZHCP.

In this paper, we focus primarily on an evaluation of the SZHCP in Tanzania and Bangladesh through qualitative analysis using in-depth interviews and focus group interviews, and quantitative studies derived from data obtained from surveys with beneficiaries and non-beneficiaries, although we discuss the results of our quantitative analysis in greater depth to enhance project evaluation objectivity. Through employing the DID method, it is possible to undertake a before-after and control-treatment comparison to assess the effects of the SZHCP. Most DID results show that the SZHCP had significantly and positively influenced the situation of beneficiaries in terms of addressing hunger, poverty, lack of drinking water, flood risk, and poor educational condition. The results of OLS and ordered logit also show that beneficiaries enjoyed changes leading to improved conditions. While we only focus on these elements of the SZHCP in this paper, the SZHCP is also considered to have led to improvements in the empowerment of women, equal rights of community members, and local governance.

Despite our effort, there are three limitations which can lead us to future research. First, as indicated before, the baseline data were collected based on the respondents' memories during the post-project survey we conducted. Similar to many development projects, the WFP or GNI were not able to conduct a baseline survey before project implementation due to limited project funding. Thus, we had to collect the data of beneficiaries and non-beneficiaries after the project. As the questionnaire responses from both beneficiaries and non-beneficiaries had similar statistical bias, the effect of the possible bias can be eased out. In addition, the data regarding beneficiaries' food security, income, and other social conditions assessed by the WFP and GNI before the project are quite similar to the data that we collected after the project. For example, the information on average income of beneficiaries collected from the initial pre-project assessment of the WFP and GNI is almost same as the information on average income that we collected using the survey after the project.

Second, our case selection of the SZHCP was not random. To avoid any unintentional bias, it would be ideal to choose the target projects randomly without knowing the results. Before the evaluation, we knew that the SZHCP is considered one of the better projects from the basic evaluation of the WFP and GNI. Nonetheless, we attempted to evaluate it with objective inspection and data. Because the case selection is not random, it is hard to generalize the results of our study. That is why we rather focus on the evaluation of the paper.

Related to this, we do not attempt to analyze the possible factors that could affect the success of the project. While we mention several possible factors that could affect the success of the project, such as expertise of implementing partners, local governance, and partnership among actors, we do not analyze these factors in-depth. Again, the main purpose of this study is to determine whether the SZHCP in Tanzania and Bangladesh can be considered successful or not. We are currently preparing to analyze the factors that can affect the success of community-based projects with multiple projects.

This study aims to evaluate sustainable CBD projects concerning food security, IGA, water access, social infrastructure, and education. As the SZHCP in Tanzania and Bangladesh attempted to

address these issues at the same time, it was possible to assess SZHCP performance across these issues. Many development projects only focus on one area of interest. For example, NGOs may just drill wells and then leave an area. While this type of project produces an output, it tends not to have a positive long-term effect on target villages. As the SZHCP tackled hunger and water access and then addressed issues arising for those on a lower income, the lives of beneficiaries have tended to significantly improve. Consequently, villagers in beneficiary villages are in a better position to promote their children's education. Each specific project is closely related to others and implemented by community-based committees. As it helps secure long-term development, the SZHCP provides a model for sustainable development. From this study, we hope that the international community involved in promoting greater development and cooperation can learn valuable lessons and implement this type of project more widely in the future.

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<Table 1> DID Analysis of the SZHCP in Tanzania: Meal Per Day

(Unit: num./day)

	Before	After	Total	
Control (Non-beneficiary)	180	180	360	
Treated (Beneficiary)	332	332	664	
	512	512	1024	
Outcome Var.	Meal Per Day	S. Err.	t	P> t
Before				
Control	1.917			
Treated	1.795			
Diff (T-C)	-0.121	0.055	-2.22	0.027**
After				
Control	2.039			
Treated	2.289			
Diff (T-C)	0.25	0.055	4.57	0.000***
Diff-in-Diff	0.372	0.077	4.8	0.000***
R-square:	0.11			

Note: Means and standard errors are estimated by liner regression.

Inference: \*\*\* p<0.01; \*\* p<0.05; \* p<0.1

<Table 2> OLS Analysis of the SZHCP in Tanzania: Meal Per Day

	Model1	Model2
	Meal per Day	Meal per Day
Beneficiary	0.358*** (0.057)	0.236*** (0.089)
Age of Head	0.002 (0.002)	0.002 (0.002)
Male Head	0.092 (0.081)	0.104 (0.081)
Num. of Household	0.002 (0.011)	0.000 (0.011)
Single Female Head	0.029 (0.106)	0.041 (0.106)
Literate Head	0.070 (0.061)	0.062 (0.061)
TASAF	0.004 (0.008)	0.006 (0.008)
Fufu		0.031 (0.081)
Suli		0.053 (0.081)
Loje		-0.120 (0.105)
Ilewelo		-0.216* (0.115)
Constant	-0.105 (0.141)	0.007 (0.154)
Num. of observations	512	512

note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

<Table 3> DID Analysis of the SZHCP in Tanzania: Meal Per Day

(Unit: TZS/month)

	Before	After	Total	
Control (Non-beneficiary)	179	176	355	
Treated (Beneficiary)	330	331	661	
	509	507	1016	
Outcome Var.	Monthly Wage	S. Err.	t	P> t
Before				
Control	78000			
Treated	43000			
Diff (T-C)	-35000	53000	-0.66	0.509
After				
Control	130000			
Treated	110000			
Diff (T-C)	-11000	53000	0.21	0.837
Diff-in-Diff	24000	75000	0.32	0.749
R-square:	0			

Note: Means and standard errors are estimated by liner regression.

Inference: \*\*\* p<0.01; \*\* p<0.05; \* p<0.1

<Table 4> OLS Analysis of the SZHCP in Tanzania: Monthly Income

	Model1	Model2
	Monthly Income	Monthly Income
Beneficiary	0.413 (0.266)	0.985* (0.516)
Age of Head	0.007 (0.011)	0.006 (0.011)
Male Head	-0.165 (0.378)	-0.128 (0.380)
Num. of Household	-0.109** (0.053)	-0.106** (0.054)
Single Female Head	-0.064 (0.493)	-0.012 (0.495)
Literate Head	0.102 (0.284)	0.051 (0.286)
TASAF	-0.015 (0.036)	-0.007 (0.038)
Suli		-0.099 (0.432)
Chiboli		-0.540 (0.376)
Loje		0.433 (0.540)
Sasajila		0.303 (0.536)
Constant	1.254* (0.654)	1.016 (0.727)
Num. of observations	506	506

note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

<Table 5> OLS and Ordered Logit Analysis of the SZHCP in Tanzania:  
Water Time and Dropout Rate from Primary School

	Model1	Model2	Model3	Model4
	Water Time	Water Time	Female Drop	Male Drop
Beneficiary	-61.207*** (5.735)	-58.124*** (9.206)	-1.170*** (0.375)	-0.665** (0.313)
Age of Head	-0.492** (0.225)	-0.395* (0.224)	0.003 (0.010)	-0.003 (0.010)
Male Head	16.717** (8.235)	15.272* (8.179)	0.323 (0.319)	0.571 (0.387)
Num. of Household	1.300 (1.154)	1.134 (1.146)	-0.035 (0.053)	0.064 (0.046)
Single Female Head	21.831** (10.650)	20.374* (10.570)	0.141 (0.465)	0.984** (0.465)
Literate Head	-6.306 (6.096)	-5.030 (6.072)	0.153 (0.275)	0.377 (0.291)
TASAF	0.506 (0.773)	0.729 (0.802)	0.036 (0.038)	-0.015 (0.039)
Fufu		-8.407 (7.929)	-0.034 (0.528)	-0.119 (0.374)
Suli		-5.407 (7.898)	0.310 (0.464)	-0.090 (0.375)
Loje		-15.816 (10.607)	-0.742** (0.334)	-0.557 (0.346)
Ilewelo		23.235** (11.692)	-1.096** (0.481)	
Constant	84.944*** (14.070)	81.981*** (15.437)	-1.099* (0.615)	-1.978*** (0.655)
Num. of observations	499	499	320	293

note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

<Table 6> DID Analysis of the SZHCP in Bangladesh: Meal Per Day

(Unit: num./day)

	Before	After	Total		
Control (Non-beneficiary)	210	210	420		
Treated (Beneficiary)	420	420	840		
	630	630	1260		
Outcome Var.	Meal Per Day	S. Err.	t	P> t	
Before					
Control	2.505				
Treated	2.443				
Diff (T-C)	-0.062	0.033	-1.87	0.061*	
After					
Control	2.862				
Treated	2.993				
Diff (T-C)	0.131	0.033	3.96	0.000***	
Diff-in-Diff	0.193	0.047	4.13	0.000***	
R-square:	0.29				

Note: Means and standard errors are estimated by liner regression.

Inference: \*\*\* p<0.01; \*\* p<0.05; \* p<0.1

<Table 7> OLS Analysis of the SZHCP in Bangladesh: Meal Per day

	Model1	Model2
	Meal per Day	Meal per Day
Beneficiary	0.152*** (0.044)	0.436*** (0.160)
Age of Head	0.004** (0.002)	0.005*** (0.002)
Male Head	-0.159 (0.286)	-0.268 (0.281)
Num. of Household	-0.004 (0.011)	-0.004 (0.010)
Single Female Head	-0.013 (0.291)	-0.102 (0.287)
Literate Head	0.019 (0.041)	-0.007 (0.041)
B_ward_1		-0.317 (0.193)
B_ward_2		-0.537*** (0.181)
B_ward_3		-0.387** (0.161)
B_ward_4		-0.473*** (0.158)
B_ward_5		-0.562*** (0.163)
B_ward_6		-0.417*** (0.161)
B_ward_8		-1.126*** (0.238)
B_ward_9		-0.383** (0.170)
NB_ward_10		-0.256*** (0.069)
NB_ward_11		-0.453*** (0.132)
Constant	0.334 (0.307)	0.600** (0.306)
Num. of observations	630	630

note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

<Table 8> DID Analysis of the SZHCP in Bangladesh: Monthly Income

(Unit: BDT/month)

	Before	After	Total	
Control (Non-beneficiary)	210	210	420	
Treated (Beneficiary)	420	420	840	
	630	630	1260	

Outcome Var.	Monthly Income	S. Err.	t	P> t
Before				
Control	2399.524			
Treated	3280.952			
Diff (T-C)	881.429	352.939	2.50	0.013**
After				
Control	3036.429			
Treated	5665.714			
Diff (T-C)	2629.286	352.939	7.45	0.000***
Diff-in-Diff	1747.857	499.131	3.50	0.000***
R-square:	0.09			

Note: Means and standard errors are estimated by liner regression.

Inference: \*\*\* p<0.01; \*\* p<0.05; \* p<0.1

<Table 9> OLS Analysis of the SZHCP in Bangladesh: Monthly Income

	Model1	Model2
	Monthly Income	Monthly Income
Beneficiary	0.462*** (0.057)	0.431** (0.213)
Age of Head	0.003 (0.002)	0.003 (0.002)
Male Head	-0.229 (0.372)	-0.224 (0.374)
Num. of Household	0.006 (0.014)	0.007 (0.014)
Single Female Head	-0.230 (0.379)	-0.258 (0.382)
Literate Head	0.026 (0.053)	0.031 (0.054)
B_ward_1		-0.211 (0.257)
B_ward_2		-0.204 (0.241)
B_ward_3		-0.043 (0.215)
B_ward_4		-0.011 (0.210)
B_ward_5		-0.156 (0.216)
B_ward_6		0.065 (0.215)
B_ward_8		0.814** (0.317)
B_ward_9		0.052 (0.226)
NB_ward_10		-0.100 (0.092)
NB_ward_11		-0.089 (0.175)
Constant	0.279 (0.399)	0.318 (0.407)
Num. of observations	630	630

note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

<Table 10> OLS and Ordered Logit Analysis of the SZHCP in Bangladesh:  
Water Time, Flood Risk, and Absent Days of Primary Schools

	Model1	Model2	Model3	Model4
	Water Time	Flood Risk Home	Flood Risk Road	Absent Days
Beneficiary	-2.880*** (0.413)	-1.503*** (0.195)	-1.863*** (0.187)	-3.037*** (0.718)
Age of Head	-0.008 (0.017)	0.004 (0.007)	-0.003 (0.007)	-0.069** (0.033)
Male Head	1.384 (2.703)	-0.992 (1.070)	-1.008 (1.009)	-5.450 (4.122)
Num. of Household	-0.138 (0.100)	0.042 (0.044)	0.002 (0.043)	-0.335* (0.186)
Single Female Head	1.659 (2.755)	-0.926 (1.094)	-1.059 (1.033)	-5.676 (4.242)
Literate Head	0.907** (0.384)	0.075 (0.165)	-0.397** (0.163)	-0.278 (0.666)
Constant	2.767 (2.903)			10.365** (4.578)
cut1		-2.057* (1.166)	-7.499*** (1.190)	
cut2		1.038 (1.163)	-2.740** (1.111)	
cut3		3.741*** (1.258)	-0.300 (1.105)	
cut4		5.136*** (1.527)	2.955** (1.209)	
Num. of observations	630	624	630	474

note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1