



# Make the village better: An evaluation of the Saemaul Zero Hunger Communities Project in Tanzania and Bangladesh

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## ARTICLE INFO

### Keywords:

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

## ABSTRACT

A majority of people in developing countries suffer from chronic hunger due to food crises and poverty. This has attracted humanitarian organizations specializing in addressing hunger, food security and poverty to set up efforts aimed at reducing hunger and poverty among vulnerable communities. This study aims to evaluate the achievements of the Saemaul Zero Hunger Communities Project (SZHCP) of the World Food Program (WFP) implemented by Good Neighbors International (GNI) in partnership with Tanzanian and Bangladesh local governments, which ran from 2014 to 2018 in selected local communities in Tanzania and Bangladesh. The project targeted the most vulnerable communities to improve their livelihood and rural development programs in terms of food security, income generation, education, and infrastructure improvement through community-based activities. To collect information and data for evaluation, we conducted field research such as in-depth interviews, focus group discussions, and household surveys in the target villages of the SZHCP in Tanzania and Bangladesh. Using qualitative analysis, difference-in-difference estimation, and linear regression on surveys of 1142 respondents, we show that the SZHCP significantly improved the livelihoods of beneficiaries in relation to zero hunger, and also 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.

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## 1. Introduction

The United Nations Secretary-General, Ban Ki-moon, launched the Zero Hunger Challenge in 2012 in order to help end world hunger, eliminate all forms of malnutrition, and build inclusive and sustainable food systems, at the UN Conference on Sustainable Development in Rio de Janeiro. Since then, many countries, International Organizations (IOs), and Non-Governmental Organizations (NGOs) have worked together to achieve zero hunger. 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 more substantial improvement. Critics have claimed that ODA from developed countries to

developing countries has made things worse (Easterly & 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 to 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. To address this issue, IOs and 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 separate from local communities, the CBD approach has been used since the 1950s in an attempt to stimulate local participation in the

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decision-making processes of community development practices (White, 1999; Mansuri & Rao, 2004). CBD projects provide resources to increase local public goods and encourage local participation by allowing local voices to be heard and permitting greater local control over the use of resources.

This study aims to evaluate the intended outcomes of the Saemaul Zero Hunger Communities Project (SZHCP) in Tanzania and Bangladesh, using qualitative and quantitative methods. The SZHCP was a World Food Programme (WFP) CBD project implemented 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\$3.3 million for Bangladesh. The project targeted the most vulnerable communities in Tanzania and Bangladesh to improve their livelihoods and rural development programs in terms of food security, income generation, infrastructure, and education through community-based activities.

The SZHCP, as a development project, 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>2</sup> The concept involves an inclusive approach to rural development, targeting improvement across different communities and individual household levels through building a community's collective assets and increasing individual household income. The practical 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 an NGO conducted the major implementation, the target communities played a crucial 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 work for change in their own lives. For example, although GNI installed boreholes in target villages, a local water committee makes the primary decisions regarding the use and maintenance of the boreholes.<sup>3</sup> As local people mainly manage most activities, target communities are able 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. At the beginning, the WFP identified the target villages and GNI as an implementing partner with multi-bi funds from the government of South Korea. GNI specializes in CBD, especially *Saemaul Undong*, and had previously worked closely with local governments in many countries including Bangladesh and Tanzania. All these actors worked closely together to make this project happen, and the resulting partnership appears to have operated with extensive transparency, accountability, and efficacy.

Due to these unique features, analysis and evaluation of the project are likely to be valuable for planning future development projects and enhancing academic knowledge in this area. Two further aspects also ensure a degree of novelty for this paper. First, this paper focuses on the effects of external intervention by an NGO in the provision of food aid, IGAs, and improved social and

economic infrastructure delivered together and combined with CBD programs. Second, this study uses 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 primary stakeholders and focus group discussions 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 1142 respondents. By including non-beneficiaries as a comparison group, we also attempted to understand the actual impact of the project better.

The results from in-depth interviews, focus group discussions, DID estimation, and OLS regression show that the SZHCP significantly improved the livelihoods of beneficiaries regarding food security and 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 prospect of ongoing hunger because of increased incomes. 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.

While Tanzania and Bangladesh do not 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. Before the project, the WFP and GNI conducted baseline field studies and observations in potential target villages. In target villages, the income level of villagers was at the lowest for each country, and villagers had faced prolonged food insecurity.

This paper focuses on the impact of the SZHCP concerning food security, income generation, and social changes including education. By using methods identified in previous studies as likely to be more rigorous, and applying a specific theoretical understanding of project evaluation, we aim to evaluate whether the SZHCP has achieved its intended outcomes. 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 discussions, 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.

## 2. A literature review of development project evaluations

### 2.1. Research on CBD projects

Beginning in the 2000s, CBD and CDD have served as essential 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 best placed to promote improvements in their livelihoods and organize to meet immediate needs if adequate resources and information could be provided. Thus, CBD involves supplying development funds directly to communities, which then decide how to use them and are responsible for planning,

<sup>2</sup> *Saemaul Undong* can be translated as "new village movement." This Korean term is widely used in many studies (Park, 2009).

<sup>3</sup> A water committee was voluntarily organized by local people with the help of GNI.

implementing, and monitoring community projects (World Bank, 2010).

Most research on CBD had revealed that it could enhance a community's capacity to provide public goods collectively in a localized way (Avdeenko & Gilligan, 2015; Fearon, Humphreys, & Weinstein, 2015). CBD advocates have argued that its participatory approach is effective in achieving objectives using 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 the communities themselves (Chambers, 1983; Ostrom, 1996).

However, despite its growing popularity among rural development practitioners, CBD suffers some drawbacks, such as inefficiencies due to elite domination, discord over incentives among stakeholders, lack of accountability, and limited capacity development. Besides, local knowledge has occasionally been represented by local elite groups, so CBD has sometimes been implemented in inappropriate ways and has not reflected gender equity (Mansuri & Rao, 2004). Some skeptics have pointed out the possibility of reduced capacity when local people take the lead in development projects (Khwaja, 2004; Bardhan & Mookherjee, 2006). Indeed, the effectiveness of CBD in achieving project outcomes is still being debated (Mansuri & Rao, 2012). Given this context, this research on the SZHCP in Tanzania and Bangladesh intends to provide insights to fill the gap between positive and negative assessments of the impacts of CBD. It can also examine the potential outcomes for sustainable livelihoods when a food security program is provided through CBD activities.

## 2.2. Research on projects for food security

Food aid, such as the SZHCP, is one of the oldest types of foreign aid, but its effectiveness remains controversial. Some observers have argued that food aid has been an ineffective means to improve food security (Clay, Dhiri, & Benson, 1996; McClelland, 1998). Contrary views have mainly been found concerning program food aid operating at a macro level. 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 have contended that this type of food aid has had no significant positive effect on hunger or poverty reduction, but rather has weakened local food supplies and markets (Schultz, 1960; Maxwell & Singer, 1979).

In contrast, other studies have shown that food aid creates positive effects in terms of food security, nutrition status, income, and other living conditions (Bezuneh, Deaton, & Norton, 1988; Holden, Barrett, & Hagos, 2006). Most positive views can be seen in the studies of project food aid, which is granted primarily for food security or specific development goals. 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) noted, most discussions of food aid have been descriptive. As an early quantitative study on food aid, Bezuneh et al. (1988), estimated the effects of Food-For-Work (FFW) and cash-for-work 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 was a simulation based on a theoretical model and did not estimate the actual effects of the programs. Holden et al. (2006) also conducted a simulation of the impacts 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 (Pantuliano, 2007). Doocy, Gabriel, Collins, Robinson, and Stevenson (2006), an early estimation at the household level, examined the effects of Cash-For-Work after a tsunami in Aceh, Indonesia, to find that food aid had positive effects on community infrastructure and household income after a disaster. Bezu and Holden (2008) found that FFW in Ethiopia had a positive effect on the use of fertilizer. Ahmed, Quisumbing, Nasreen, Hoddinott, and Bryan (2009) conducted a comprehensive study using more rigorous experimental methods to assess the impact of food aid. They analyzed the effects of food aid on the welfare of households in Bangladesh and compared the impact among four types of food aid: IGA, food security, Food Assistance for Assets (FFA), and rural maintenance programs. Their empirical results showed that IGA and food security programs were more cost-effective than FFA and rural maintenance programs for income growth and poverty reduction. More recently, Rawat, Faust, Maluccio, and Kadiyala (2014) estimated the effects of food aid for HIV-infected people in Uganda and reported a positive effect on nutritional status and food security.

Given these studies, there are few empirical studies on food aid, using rigorous impact evaluation methods. This paper utilizes a quasi-experimental method, the DID method, to evaluate the impacts of food aid.

## 2.3. 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 (Winters et al., 2009; Chhay, 2011; Mahmud, Islam, Parvez, & Haque, 2017; Geleta, Henry, & Elabor-Idemudia, 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 what extent IGA interventions have increased total income for the participating individuals, groups, and communities, and how differently men and women have benefited 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 (Kapur, Mukhopadhyay, & Subramanian, 2008; Shah, 2008).

Davis et al. (2010) presented an empirical analysis of rural IGA using a cross-country database derived from multipurpose household surveys. While they did not specify whether NGO-related IGA was involved, their findings provided 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 multiple methods. Through adopting qualitative methods, Gibson (1993) assessed IGA projects in Zimbabwe and Kenya, providing some recommendations for NGOs and donors. He argued that NGOs should adopt a more businesslike operation without losing their original purpose and goals. NGOs also 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 concluded that the project had been successful in increasing the income of participants,

especially female participants. A study by [Chun and Watanabe \(2012\)](#) also utilized household survey data that comprised of 320 participants and 451 non-participants for project evaluation in Bhutan. That study found 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. With the success of Grameen Bank and Bank Rakyat Indonesia, microfinance became popular during the 1980s and the 1990s, which have been referred to as “the microfinance decades” ([Dichter, 1997](#)). Many studies have shown that microfinance can contribute to poverty alleviation, income generation, and access to credit ([Remenyi, 1991](#); [Pitt & Khandker, 1998](#); [Khandker, 2005](#); [Maldonado & González-Vega, 2008](#); [Bateman & Chang, 2012](#)).

Nonetheless, critics have argued that the impact of microfinance has been equivocal and uneven, ranging from positive to negligible and even negative. Uncertain benefits, the trend toward commercialization, and the lack of focus on serving the poor can be key negative aspects of microfinance ([Bateman & Chang, 2012](#)). ‘Microfinance meltdown’ with over-indebtedness and defaults in Bolivia in 1999–2000, Morocco and Pakistan in 2008, and Bosnia in 2009 reinforced the negative view of the fragility of financial inclusion through microfinance.

Overall, studies have shown that the impact of microfinance on income growth for beneficiaries depends on local context. In addition, any positive effect is subject to multiple factors such as different household and individual characteristics, the degree of social capital, levels of enterprise activities, attitudes to debt, financial literacy, and service providers ([Bouillon & Tejerina, 2007](#); [Stewart et al., 2010](#)).

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 with 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, Spilimbergo, & Wachtenheim, 1998](#); [Grimm, 2011](#); [Gyimah-Brempong & Asiedu, 2015](#)).

### 3. Project description and methodology

#### 3.1. 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.<sup>4</sup> 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. The SZHCP combines the WFP’s Zero Hunger Program with experience gained from South Korea’s previous rural development initiative *Saemaul Undong*, which contributed to the development of rural areas in South Korea.

#### 3.2. The SZHCP in Tanzania

In Tanzania, the project started in Chamwino district, Dodoma region, in January 2014, in partnership with Good Neighbors Tanzania (GNTZ) and the Chamwino District Council at the field level,

and ended in February 2018.<sup>5</sup> 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’s being severely affected by drought and deteriorating food production capacities, and this LLPPA provided grounds for further study and more in-depth analysis of the target villages. From 92 villages in the Chamwino district, Fufu, Suli, and Chiboli were selected as the target villages because these were the most vulnerable villages in terms of food security and extreme poverty. The beneficiaries from these three villages were also chosen based on the initial assessment of the WFP and GNTZ, considering their food security, and the number of beneficiaries was 12,280 people (2456 households with, on average, five persons in each household).

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 savings schemes, and loan associations.

#### 3.3. The SZHCP in Bangladesh

From January 2014 to June 2017, the SZHCP had been implemented by the WFP in partnership with Good Neighbors Bangladesh (GNB) in 19 villages of the Nalka union of Raiganj Upazila in the Sirajganj district. These villages had high levels of poverty and were highly vulnerable to disasters: in particular, to regular flooding and extreme river erosion. The project targeted 1800 households from among the most vulnerable families in these villages as direct beneficiaries.<sup>6</sup> The beneficiaries were selected to meet at least three of the following four criteria: (i) female-headed household having no regular income, (ii) household owning less than less than 0.15 acres of land (iii) household suffering from chronic food insecurity, (iv) household owning virtually no productive assets. In addition, the motivation and enthusiasm of community members to participate in the project was taken into account. The baseline survey conducted by the WFP observed that 63.3 percent of the participant households were poor by the standard of Bangladesh’s national upper poverty line in 2014.

The SZHCP in Bangladesh incorporated four key activities. The first was a Food-and-Cash-For-Work 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>7</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>8</sup> The third activity involved a cash grant

<sup>5</sup> While the official SZHCP in Tanzania ended in February 2019, GNTZ was continuing its project with its own funding at the time of writing. The population of the Chamwino district is 294,298 with 69,038 households (average 4.26 persons per household), according to the population census of 2012.

<sup>6</sup> The project chose one participant from each household.

<sup>7</sup> Each participant received 2kg rice, 200g yellow split peas, 100g oil, and Bangladeshi Taka (BDT) 58 for the filling in of 1 cubic meter of soil in building infrastructure schemes.

<sup>8</sup> While undertaking FCFT sessions, each participant received 22.5kg rice and BDT 652.50 per month as a training allowance.

<sup>4</sup> The Ministry of Foreign Affairs and Trade in South Korea became the Ministry of Foreign Affairs in 2013.

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, the project provided a monthly allowance of 500 BDT to the IGA participants for one year. The last activity comprised a range of skill and capacity building endeavors guided by the *Saemaul Undong* approach, which included environmental improvement, water and sanitation improvement, and social infrastructure development.

### 3.4. Methods and survey respondent 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 discussions. 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 had been installed or implemented through field observation. 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 discussions 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. As a quasi-experimental method, the DID method is widely used (Slaughter, 2001; Donald & 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 program intervention. One can estimate the effects, assuming that unobserved heterogeneity is time invariant and uncorrelated with the treatment over time. In Fig. 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,  $(Y_4 - Y_2)$ .

In this evaluation, a stochastic homogeneity cannot be obtained between treatment and control groups. However, we deliberately constructed the control group 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 target villages. For instance, villages adjacent to the 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 risk of natural disasters such as floods were selected as control villages.

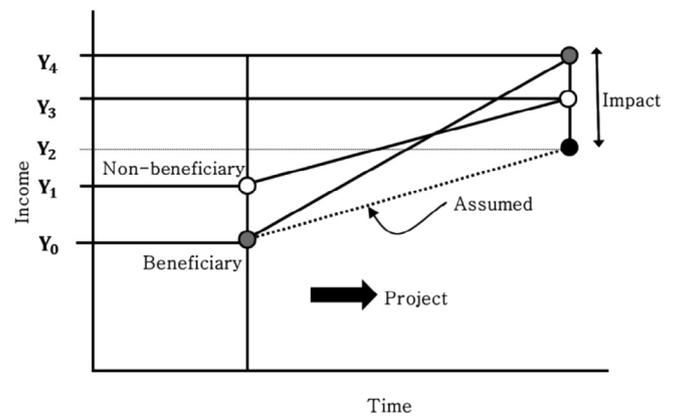


Fig. 1. DID Estimation.

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.

For the selection of survey respondents, we used a stratified sampling as we randomly chose respondents from among beneficiaries and non-beneficiaries. The SZHCP in Tanzania targeted three villages, Fufu, Suli, and Chiboli, in the Chamwino district of the Dodoma region. The face-to-face survey in Tanzania was conducted with 512 households by trained enumerators from April to June in 2018. Out of 512 households, 332 households were randomly selected from the three beneficiary villages, and 180 were randomly selected from three non-beneficiary villages, Loje, Ilewelo, and Sasajila, which were chosen because they shared similar socioeconomic conditions with beneficiary villages.

In Bangladesh, the project was implemented in Nalka union.<sup>9</sup> There are nine wards in Nalka union, comprising 40 villages. Out of these, the project was implemented in 19 villages from nine wards. The 420 beneficiary survey respondents were randomly selected among 1800 participants in these target villages. After control groups were selected using the criteria explained before, the survey for non-beneficiaries was conducted with 210 respondents from three villages of three wards in Nalka union. 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 relating to the projects.<sup>10</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>11</sup> [The 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-project survey relying on the memory of respondents, which risked some degree of inaccuracy in recalling events before 2014.<sup>12</sup> In addition, the unit of a village in Tanzania and Bangladesh is not identical in terms of size and population. The average population of a village in Tanzania (3198) is significantly bigger than that of one in Bangladesh (1064).

<sup>9</sup> The population of the Nalka Union is 42,597 with 9378 household according population census 2011. The average household size is 4.54.

<sup>10</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>11</sup> The complete questionnaires used in the survey can be shared upon request.

<sup>12</sup> This limitations of the empirical studies are addressed in the Conclusion section.

## 4. Results from empirical analyses

### 4.1. An empirical analysis of the effects of the SZHCP in Tanzania

The results of DID shown in [Table 1](#) show 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 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>13</sup>

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 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>14</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 the 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.

Alongside 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 2018 and calculated the difference between the 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-project 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 discussions 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 different levels of ownership and cooperation.<sup>15</sup>

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 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 discussions, 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. From our empirical analysis, it was clear that being a project beneficiary village helped decrease the primary school dropout rate significantly. 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 on a small 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.

### 4.2. 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 various zero hunger-related activities. The results of DID in [Table 6](#) show that meals consumed per day for beneficiaries statistically significantly increased over the last

<sup>13</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 on TASAF can be found on its official website ([www.tasaf.go.tz](http://www.tasaf.go.tz))

<sup>14</sup> On December 31, 2014, US\$1 was equivalent to 1735 TZS, and on June 30, 2018, US\$1 was equivalent to 2274 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>15</sup> This is also supported by an interview with the regional director of GNTZ in Dodoma, who was in charge of the implementation of the project in the beneficiary villages.

**Table 1**  
DID Analysis of the SZHCP in Tanzania: Meals per Day.

	Before	After	(Unit: num./day)	
			Total	
Control (Non-beneficiary)	180	180	360	
Treated (Beneficiary)	332	332	664	
	512	512	1024	
Outcome Var.	Meals 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 linear regression.

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

Source: Survey data collected by GNTZ and the authors (June 2018).

**Table 2**  
OLS Analysis of the SZHCP in Tanzania: Meals per Day.

	Model1 Meals per Day	Model2 Meals 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: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Source: Survey data collected by GNTZ and the authors (June 2018).

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>16</sup>

<sup>16</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 from the base comparison.

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 might not necessarily have been the most impoverished villages. The income of beneficiaries was 3280 BDT in 2014 and increased to 5665 BDT in 2018, which represents an increase of approximately 73 percent in income per month.<sup>17</sup> Over the same period, the income of non-beneficiaries changed from 2399 BDT to 3036 BDT, representing only a 26 percent increase in comparison. The results of OLS in Table 9 also show that the project had a statistically significant and positive effect on income change.

From our focus group discussions, it appeared that the beneficiaries were very satisfied with the project and that they had all actively participated in it,<sup>18</sup> as indicated below by one beneficiary:

We are all satisfied with 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 just 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 money through income generating activities. We hope that the project may continue here longer. In that way, we will be better off.

Similarly 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

<sup>17</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>18</sup> This is supported by an in-depth interview with the regional director of GNB, who was in charge of the project.

**Table 3**  
DID Analysis of the SZHCP in Tanzania: Monthly Income.

	Before	After	(Unit: TZS/month)	
			Total	
Control (Non-beneficiary)	179	176	355	
Treated (Beneficiary)	330	331	661	
	509	507	1016	
Outcome Var.	Monthly Income	S. Err.	t	P> t
Before				
Control	78,000			
Treated	43,000			
Diff (T-C)	-35000	53,000	-0.66	0.509
After				
Control	130,000			
Treated	110,000			
Diff (T-C)	-11000	53,000	0.21	0.837
Diff-in-Diff	24,000	75,000	0.32	0.749
R-square:	0			

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

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

Source: Survey data collected by GNTZ and the authors (June 2018).

**Table 4**  
OLS Analysis of the SZHCP in Tanzania: Monthly Income.

	Model1 Monthly Income	Model2 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.

Source: Survey data collected by GNTZ and the authors (June 2018).

beneficiary villages, the risk of flooding in homes and on roads significantly decreased, as shown in Models 2 and 3 in Table 10.<sup>19</sup> This outcome provides more excellent 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.

<sup>19</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.

Based on our evaluations in the field, the SZHCP in both Tanzania and Bangladesh produced the planned 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 disasters, and education using in-depth interviews, focus group discussions, 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.

Besides, 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 a 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>20</sup>

## 5. Conclusion

The SZHCP in Tanzania and Bangladesh attempts to improve the livelihood and rural development of villages, as well as their food security. Due to the concrete achievements of the SZHCP, 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.

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 discussions, and quantitative studies derived from data obtained from surveys with beneficiaries

<sup>20</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.

**Table 5**

OLS and Ordered Logit Analysis of the SZHCP in Tanzania: Water Time and Dropout Rate from Primary School.

	Model1 Water Time	Model2 Water Time	Model3 Female Dropout	Model4 Male Dropout
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 &lt; 0.01, \*\* p &lt; 0.05, \* p &lt; 0.1.

Source: Survey data collected by GNTZ and the authors (June 2018).

**Table 6**

DID Analysis of the SZHCP in Bangladesh: Meals per Day.

	Before	After	(Unit: num./day) Total	
Control (Non-beneficiary)	210	210	420	
Treated (Beneficiary)	420	420	840	
	630	630	1260	
Outcome Var.	Meals 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 linear regression.

Inference: \*\*\* p &lt; 0.01; \*\* p &lt; 0.05; \* p &lt; 0.1.

Source: Survey data collected by GNB and the authors (March 2018).

and non-beneficiaries. 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 situation. The results of OLS and ordered logit also show that beneficiaries enjoyed changes leading to improved conditions. These findings are consistent with previous empirical studies on project food aid (Ahmed et al., 2009; Rawat et al., 2014).

Despite our efforts, 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 pre-project data of beneficiaries and non-beneficiaries after the project. As the questionnaire responses from both beneficiaries and non-beneficiaries had a similar statistical bias, the effect of the possible bias can be somewhat 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 the 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. The random selection of target projects without knowing the results would ideally help avoid any intentional and unintentional selection bias. Before the evaluation, however, we knew that the SZHCP

**Table 7**  
OLS Analysis of the SZHCP in Bangladesh: Meals per Day.

	Model1 Meals per Day	Model2 Meals 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.

Source: Survey data collected by GNB and the authors (March 2018).

was considered one of the better projects from the preliminary assessment of the WFP and GNI. Because the case selection was not random, it may limit the generalization of the results of our study.

Related to this, we do not attempt to analyze possible factors that could affect the success of the project. While we mention several potential 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

**Table 9**  
OLS Analysis of the SZHCP in Bangladesh: Monthly Income.

	Model1 Monthly Income	Model2 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.

Source: Survey data collected by GNB and the authors (March 2018).

in-depth. We are currently preparing to analyze the factors that can affect the success of community-based projects with multiple projects.

As the SZHCP in Tanzania and Bangladesh attempted to address food security, IGA, water access, social infrastructure, and education 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 a field. While this type of project produces an output, it tends

**Table 8**  
DID Analysis of the SZHCP in Bangladesh: Monthly Income.

	Before	After	(Unit: BDT/month)	
			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 linear regression.

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

Source: Survey data collected by GNB and the authors (March 2018).

**Table 10**

OLS and Ordered Logit Analysis of the SZHCP in Bangladesh: Water Time, Flood Risk, and Days Absent from Primary Schools.

	Model1 Water Time	Model2 Flood Risk Home	Model3 Flood Risk Road	Model4 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 &lt; 0.01, \*\* p &lt; 0.05, \* p &lt; 0.1.

Source: Survey data collected by GNB and the authors (March 2018).

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 improve significantly. 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 to secure long-term development, the SZHCP provides a model for sustainable development. From this study, we hope that the international community involved in promoting more significant development and cooperation can learn valuable lessons, and implement this type of project more widely in the future.

### Declaration of Competing Interest

None.

### Acknowledgements

We want to express our gratitude for the support of Good Neighbors International (GNI), especially Ilha Yi (Chairman) and Jinok Yang (President). We also thank GNI staffs including Haeun Seong, Younju Kim, Sun Kim, Namun Heo, Jeoungsek Kim, Miyoung Jin, and Yanghee Kim for their invaluable input. Hyoung-Joon Lim, a director of WFP Korea, provided insight for our understanding of WFP projects. While the paper shares some contents from the GNI report that the authors along with Heeyul Jeong, Hyeran Hong, Jihye Ahn, and Haejung Yoon contributed to, it is entirely rewritten in an academic style. This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2018S1A3A2075117). Y. Kim also gives thanks for the support from Hankuk University Foreign Studies Research Fund.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.worlddev.2019.104652>.

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