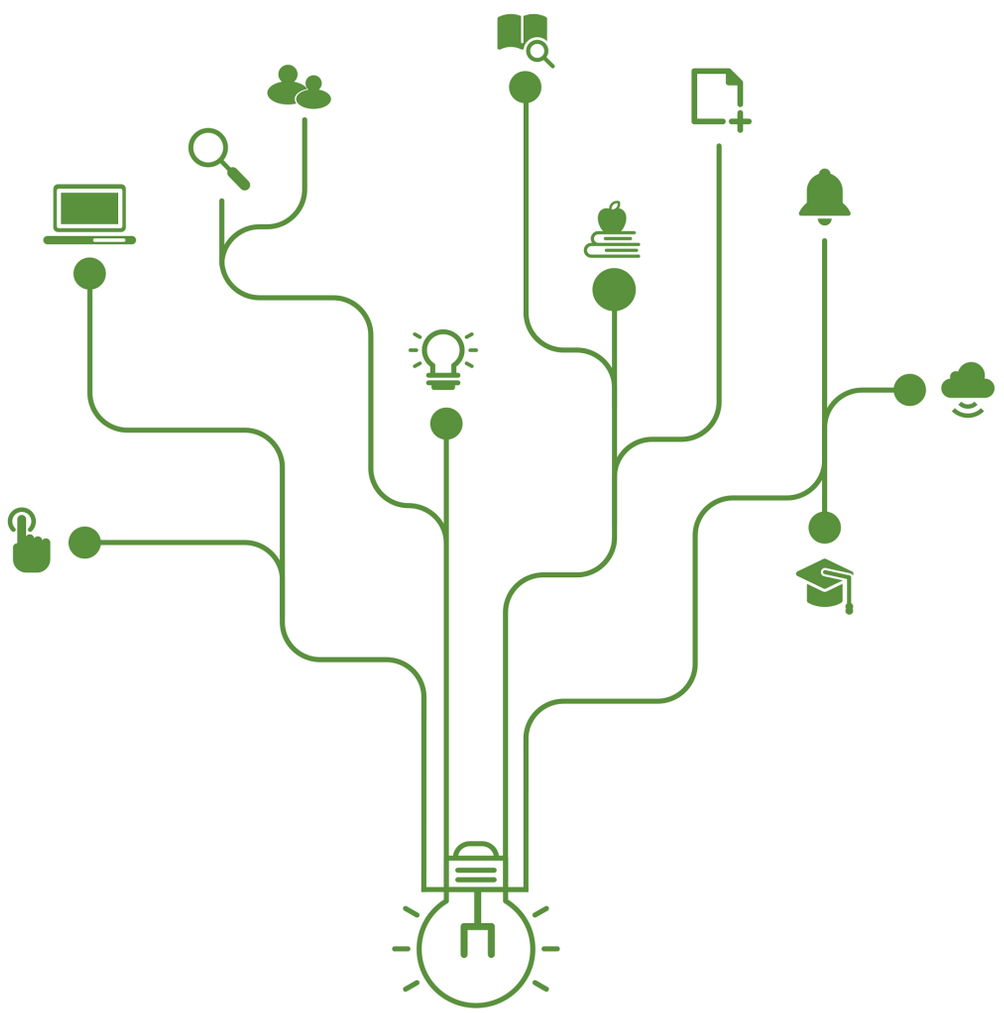
Development Studies Series 05

Endline Report for the Self-Supporting Rural Development Project with Saemaul Undong's Participatory Approach in Myanmar

김부열, 최승주



KDI SCHOOL
KDI School of Public Policy and Management

Endline Report for the Self-Supporting Rural Development Project with Saemaul Undong's Participatory Approach in Myanmar

Booyuel Kim[1)]
Syngjoo Choi[2)]

Introduction

The Self-Supporting Rural Development Project with Saemaul Undong's Participatory Approach (hereafter SMU) in Myanmar, implemented jointly by Korea International Cooperation Agency (KOICA) and the Ministry of Agriculture, Livestock, and Irrigation (MOALI) from 2014 to 2019, is the largest rural development project in Southeast Asia implemented by KOICA. Excluding the budget for the construction of the Saemaul Undong Training Institute in Myanmar, the project is worth more than 10 billion Korean won (equivalent to USD 9 million), which includes the budget for the implementation of rural community development projects in 100 pilot villages across nine regions in Myanmar over three years.

As the scale of KOICA's development projects has expanded dramatically, and projects with large budgets of over 10 billion won, including Myanmar's rural community development projects, have increased significantly, there have been increasing discussions on how to evaluate various projects implemented by KOICA. The evaluation method used by KOICA can be described as Process Evaluation using Project Design Matrix(PDM), which summarizes the logical framework based on the Theory of Change. While the PDM evaluated in the order of inputs, activities, outputs, outcomes, and impacts has the

1) Associate Professor, Graduate School of Environmental Studies, Seoul National University, booyuel@snu.ac.kr
2) Professor of Economics, Seoul National University, syngjooc@snu.ac.kr

advantage of being particularly useful for process evaluation, it assumes a causal relationship between inputs/activities and outcomes/impacts and thus cannot be scientifically proven.

In an effort to address these limitations of process evaluation, impact evaluation method focused on identifying causal relationships has received increasing attention. Abhijit Banerjee (University of MIT), Esther Duflo (University of MIT), and Michael Kremer (University of Harvard) have conducted impact evaluations applying a randomized controlled trial (RCT) to various development projects since the mid-1990s. They have also received the 2019 Nobel Prize in Economics for their contributions to poverty alleviation and development policies based on scientific evidence derived from impact evaluation findings.

National aid agencies such as USAID and DFID, and inter-governmental organizations such as the World Bank and the Asian Development Bank have been actively conducting impact evaluations of their development projects. In particular, the World Bank has established the Development Impact Evaluation Initiative (DIME) in order to evaluate their major projects. KOICA also carried out an impact evaluation, along with process evaluation, when implementing the Myanmar rural community development project in line with these international evaluation trends. The Myanmar Rural Development Project Impact Evaluation Study is meaningful in that it is the first large-scale impact evaluation research conducted by KOICA.[3)]

The rest of the report is as follows. Chapter 2 summarizes the background of the impact evaluation of the KOICA Myanmar Rural Development Project, Chapter 3 discusses the impact evaluation methodology, and Chapter 4 analyzes the main results of the impact evaluation. Finally, in Chapter 5, we provide recommendations for policymakers who are planning to implement a large-scale impact evaluation study such as the Myanmar rural development project.

The summary of the impact evaluation results of the Myanmar rural development project is as follows. There was no statistically significant impact on social capital, which was set as one of the main outcome variables, but the Myanmar rural development project improved the living environment in the village, increased access to microfinance, and increased income. Since a randomized controlled trial, comparing randomly selected

---

3) KOICA's first impact evaluation efforts was the evaluation of drinking water improvement projects conducted in Volta, Ghana, West Africa from 2012 to 2014 (Cha et al., 2015). Cha, Seungman, Douk Kang, Benedict Tuffuor, Gyuhong Lee, Jungmyung Cho, Jihye Chung, Myongjin Kim, Hoonsang Lee, Jaeeun Lee, and Chunghyeon Oh. "The effect of improved water supply on diarrhea prevalence of children under five in the Volta region of Ghana: a cluster-randomized controlled trial." International journal of environmental research and public health 12, no. 10 (2015): 12127-12143.

treatment villages to control villages, was not possible for this impact evaluation study, two behavioral experiments were implemented.

KOICA's rural development project in Southeast Asia reflects the experience of Saemaul Undong in Korea, and includes a differential incentive structure that pays incentives to villages with better performance through competition among project villages. The behavioral experiments attempted to analyze whether the inter-village competition, a key mechanism of the KOICA rural development projects, affected the increase of social capital in the villages. In Myanmar, where the level of social capital was remarkably high from the baseline, we could not observe any effect of the inter-village competition from the behavioral experiments.[4)]

Background

KOICA has invested an extraordinarily large budget into its Project Management Consulting (PMC) contract while developing the rural development project in Myanmar. Since the Myanmar rural development project was the largest in scale among the rural development projects that KOICA carried out in five Southeast Asian countries, there was a demand within KOICA that the Myanmar project was accompanied by a strict evaluation. A total of four surveys (one baseline survey, two midline surveys and one endline survey) were conducted for 100 pilot villages in nine regions. Table 1 lists the 100 pilot villages divided into village tracks, townships, and regions.

Table 1. List of 100 SMU Villages

No.	Village Name	Village Tract	Township	Region
1	Zeephyukone	Yan Aung Myin	Dekhinathiri	NayPyiTaw
2	Pauktaw	Yan Aung Myin	Dekhinathiri	NayPyiTaw
3	Tatpoe	Yan Aung Myin	Dekhinathiri	NayPyiTaw
4	Ywarma (YAM)	Yan Aung Myin	Dekhinathiri	NayPyiTaw
5	Ywarma (YM)	Ywar Ma	Dekhinathiri	NayPyiTaw
6	Myaukkyaungs	Ywar Ma	Dekhinathiri	NayPyiTaw
7	Taungkyaungs	Ywar Ma	Dekhinathiri	NayPyiTaw
8	KyarKoo (Wes	Ywar Ma	Dekhinathiri	NayPyiTaw
9	KyarKoo (Eas	Ywar Ma	Dekhinathiri	NayPyiTaw
10	Shwepyi	Ywar Ma	Dekhinathiri	NayPyiTaw

4) In case of behavioral experiments, the study was designed as a comparative study of two countries, Myanmar and Cambodia. The Pre-Analysis Plan for this study titled "The Impact of Inter-Village Competition and Leadership on Collective Action: Experimental Evidence from Myanmar and Cambodia" was uploaded on the AEA RCT Registry on May 7, 2019. https://www.socialscienceregistry.org/trials/4180.

No.	Village Name	Village Tract	Township	Region
11	Chai	Chai	Dekhinathiri	NayPyiTaw
12	Maetee	Chai	Dekhinathiri	NayPyiTaw
13	Shwekeinn	Shwe keinn	Dekhinathiri	NayPyiTaw
14	Kyaukeinn	Shwe keinn	Dekhinathiri	NayPyiTaw
15	Kywetae	Shwekeinn	Dekhinathiri	NayPyiTaw
16	Gusaesu (Sae	Gusaesu	Dekhinathiri	NayPyiTaw
17	Tharyarsu	Gusaesu	Dekhinathiri	NayPyiTaw
18	Padaukkone	Gusaesu(saesu)	Dekhinathiri	NayPyiTaw
19	Magyikone	Gusaesu(saesu)	Dekhinathiri	NayPyiTaw
20	Gwaydaukyoe	Guu Sel Su	Dekhinathiri	NayPyiTaw
21	Kyesar U	Gusaesu(saesu)	Dekhinathiri	NayPyiTaw
22	Doenwe	Doenwe	Dekhinathiri	NayPyiTaw
23	Ywarthit	Doenwe	Dekhinathiri	NayPyiTaw
24	Yede	Doenwe	Dekhinathiri	NayPyiTaw
25	Aungthukha	Kyar Pin	Dekhinathiri	NayPyiTaw
26	Htantapin	Kyar Pin	Dekhinathiri	NayPyiTaw
27	Nyaungkone	Kyun Tatpet	Dekhinathiri	NayPyiTaw
28	Saesu (Kyunt	Kyauntatpe	Dekhinathiri	NayPyiTaw
29	Maezalekone	Maezalekone	Pyinmana	NayPyiTaw
30	Kyaunkone	Ywarthit	Pyinmana	NayPyiTaw
31	Ywarthar	Ywarthar	Pyinmana	NayPyiTaw
32	Ngakaungkan	Ngakaungkan	Pyinmana	NayPyiTaw
33	Gonemininn	Taegyigone	Zebuthiri	NayPyiTaw
34	Shartaw	Thae Gyikone	Zebuthiri	NayPyiTaw
35	Taegyikone	Taegyigone	Zebuthiri	NayPyiTaw
36	Kyankhinsu	Yonepin	Lewe	NayPyiTaw
37	Thawmawkone	Thawmawkone	Lewe	NayPyiTaw
38	Kyaunkone (L	Thawmawkone	Lewe	NayPyiTaw
39	Kanthar	Thawmawkone	Lewe	NayPyiTaw
40	Yanking (E)	Ayelar	Lewe	NayPyiTaw
41	Luyoetaung	Konlon	Taunggyi	Shan
42	Phayarmae	Konlon	Taunggyi	Shan
43	Benkanywarma	Konlon	Taunggyi	Shan
44	Nyaungzin	Konlon	Taunggyi	Shan
45	Kyautsu	Konlon	Taunggyi	Shan
46	Tharminekhan	Tharminekhan	Kalaw	Shan
47	Latpanpin	Thikhaung	Kalaw	Shan
48	Oattakan	Thikhaung	Kalaw	Shan
49	Poneinn	Heho	Kalaw	Shan
50	Naunglawe	Kyouk Htat	Kalaw	Shan
51	Daungyway	Daungyway	Amarapura	Mandalay
52	Mintekone	Sin bo	Amarapura	Mandalay
53	Nandar	Nandar	Patheingyi	Mandalay
54	Nweni	Nyein Chan Thar Zan	Patheingyi	Mandalay
55	Banttin	Banttin	Patheingyi	Mandalay
56	Latthit	Latthit	Patheingyi	Mandalay

No.	Village Name	Village Tract	Township	Region
57	Shwepyaeyin	Shwepyaeyin	Nwarhtoegyi	Mandalay
58	Htangua (Sou	Htangua	Nwarhtoegyi	Mandalay
59	Htanzin (Sou	Htangua	Nwarhtoegyi	Mandalay
60	Kanphyu (E)	Latkaunggyi	Matayar	Mandalay
61	Butar	Butar	Chaung Oo	Sagaing
62	Shwedarkya	Nyaung Pin Thar	Chaung Oo	Sagaing
63	Sulaekone	Sulaekone	Chaung Oo	Sagaing
64	Inma	King Mon Taw	Chaung Oo	Sagaing
65	Yargyitaw	Wayar	Chaung Oo	Sagaing
66	Kutokone	Kutokone	Myaung	Sagaing
67	Kyar O	Kyar O	Myaung	Sagaing
68	Tamasaykan	Tamasaykan	Myaung	Sagaing
69	Kyauk O	Kyouk O	Minkin	Sagaing
70	Kanpyar (E)	Kanpyar	Myinmu	Sagaing
71	Zayatsait	Kyaungpankone	Pathein	Ayarwaddy
72	Kanniphyar	Kanni	Pathein	Ayarwaddy
73	Phayargyikon	Paukkone	Pathein	Ayarwaddy
74	Tikeswan	Koesu	Pathein	Ayarwaddy
75	Kwatpyingyi	Linnwungyi	Pathein	Ayarwaddy
76	Nyaungchaung	Kyonegyi	Kangyidauk	Ayarwaddy
77	Kwinyargyi	Kwinyargyi	Kangyidauk	Ayarwaddy
78	Sarphyusu (K	Myinkaseik	Kangyidauk	Ayarwaddy
79	Ywarthitkone	Michaungtayar	Kangyidauk	Ayarwaddy
80	Kyaunchaung	Khonezinkone	Kangyidauk	Ayarwaddy
81	Pyitawthar (	Kali	Bago	Bago
82	Deweinn	Ahtetzaingganainggyi	Bago	Bago
83	Taungthusu	Katwinchan	Bago	Bago
84	Saynyaungpin	Outcity (East)	Bago	Bago
85	Ywarma (Mayi	Mayin	Bago	Bago
86	Waegyi	Waegyi	Kyauktan	Yangon
87	Ahtetkhamat	Khmat	Khayan	Yangon
88	Nankhalae	Latpan	Tonegwa	Yangon
89	Yoewa	Myaungtakar	Hmawbe	Yangon
90	Yintaikwin	Yintaikwin	Taikgyi	Yangon
91	Daykin	Daykin	Paung	Mon
92	Oatkan	Oatkan	Paung	Mon
93	Ahauk	Ahauk	Paung	Mon
94	Kadine	Kadine	Paung	Mon
95	Kawhtaw	Kawhtaw	Paung	Mon
96	Kaningdar	Kanaingdar	Dawei	Tanintharyi
97	Zahar	Zahar	Dawei	Tanintharyi
98	Maungmaeshau	Maungmaeshaung	Dawei	Tanintharyi
99	Tharyarkone	Tharyarkone	Lounglone	Tanintharyi
100	Maemaw	Thabyar	Lounglone	Tanintharyi

However, it was not possible to carry out an impact evaluation to prove the causality of KOICA's rural development project by conducting a survey only on the 100 project villages. The initial settings of the evaluation only allowed process evaluation based on before-and-after analysis.

While KOICA was deeply aware of the need for an impact evaluation based on a rigorous design, there was no specific discussion of what procedures are required to carry out these impact evaluations, how the evaluation studies should be designed, and how the budget should be reflected.

In order to conduct an impact evaluation, the impact evaluation lab of the KDI School of Public Policy and Management signed a contract with the KOICA. In consultation with the MOALI, we identified 50 control villages while the first year of the Myanmar Rural Community Development Project was underway in the 100 SMU villages. The Agricultural Department of MOALI selected the 50 comparison villages that share similar characteristics to the 100 pilot villages within the same townships. The 50 control villages are listed in Table 2.

Table 2. List of 50 Comparison Villages

No.	Village Name	Village Tract	Township	Region
1	Ma Pu Pin	Kyun Oo	Pyinmana	Nay Pyi Taw
2	Lae Luu I	Le Lu Aing	Pyinmana	Nay Pyi Taw
3	Zaung Chan Kone	Nga Kaung Kan	Pyinmana	Nay Pyi Taw
4	A Lyin Lo	Ah Lyin Lo	Zebuthiri	Nay Pyi Taw
5	Pan Tin	Pyaung Gaung Gyi	Lewe	Nay Pyi Taw
6	Tha Man Pin	Aye Lar	Lewe	Nay Pyi Taw
7	Thae Kaw Lay	Thea Kaw Gyi	Lewe	Nay Pyi Taw
8	Kan Oo	Pay Tone Hmyaung	Lewe	Nay Pyi Taw
9	Ma Dot Pin	Ma Tawt Pin	Lewe	Nay Pyi Taw
10	Ta Lote Pin	Ta Loke Pin	Lewe	Nay Pyi Taw
11	Kone Paw Su	Pay Tone Hmyaung	Lewe	Nay Pyi Taw
12	Zee Kone	Yae Oe Sin	Lewe	Nay Pyi Taw
13	Nyaung Pin Thar	Si Paing	Lewe	Nay Pyi Taw
14	Hman Taw	Thet Kei Chin	Lewe	Nay Pyi Taw
15	Watt Ka Mu	Wet Ka Mu	Lewe	Nay Pyi Taw
16	Kyoe Pin	Kyoet Pin	Lewe	Nay Pyi Taw
17	Nan Aww	Kun Long	Taunggyi	Shan
18	Thein Inn	Kun Long	Taunggyi	Shan
19	Narr Hit	Kun Long	Taunggyi	Shan
20	Myat Sat (North)	Baw Nin	Kalaw	Shan
21	Taung Pat	Thi Hkawng	Kalaw	Shan

No.	Village Name	Village Tract	Township	Region
22	Nyaung Pin Khar Shae	Baw Nin	Kalaw	Shan
23	Thar Hla Aye	Ta Moke Soe	Amarapura	Mandalay
24	Kan Kwe	Nay Rit Sa Ya	Patheingyi	Mandalay
25	Taung Ta Tine Shae	Taung Tatine Shay	Patheingyi	Mandalay
26	Oak Twin	Oke Twin	Nwar Htoe Gyi	Mandalay
27	Tha Pyay Kone	Let Kaung Gyi	Matayar	Mandalay
28	Htar Wae Inn	Ku Lar Gyi	Chaung Oo	Sagaing
29	Shwe Kuu	Shwe Gu	Chaung Oo	Sagaing
30	Phwar Saw	Hpwar Saw	Myaung	Sagaing
31	Inngyin Taung	Inn Kyin Taung	Minkin	Sagaing
32	Sat Pyar Kyin	Kan Taw	Myin Mu	Sagaing
33	Tike Gyi Kone	Tike Gyi Kone	Pathein	Ayeyarwaddy
34	Pyin Ka Toe Kone	Pyin Ka Doe Kone	Pathein	Ayeyarwaddy
35	Kyauk Chaung Kyi	Kyauk Chaung Gyi	Pathein	Ayeyarwaddy
36	Yoe Gyi	Tha Bawt Ngu	Kangyi Dauk	Ayeyarwaddy
37	Ka Twin Chan	Tha Bawt Ngu	Kangyi Dauk	Ayeyarwaddy
38	Thae Gyi Kone	Kyon Gyi	Kangyi Dauk	Ayeyarwaddy
39	Pyi Taw Aye	Ma Yin	Bago	Bago
40	Ka Twin Chan	Ka Twin Chan	Bago	Bago
41	Thae Gyi Kone	Ah Htet Zaing Ga Naing Gyi	Bago	Bago
42	That Kal Gyin	Thet Kei Kone	Kha Yan	Yangon
43	Tha Yet Taw	War Net Chaung Bu Tar	Hmawbi	Yangon
44	Oak Kan Kan Kone	Oke Kan Kan Kone	Tike Gyi	Yangon
45	Kyar Bo	Kyar Bo	Paung	Mon
46	Nyaung Kone Lay	Nyaung Kone Lay	Paung	Mon
47	Bai Laung	Htan Pin Chaung Gyi	Paung	Mon
48	Thae Pone	Thar Yar Kone	Launglone	Tanintharyi
49	Za Lon	Za Lun	Htarwae	Tanintharyi
50	Kyauk Yat	Kyauk Yat	Htarwae	Tanintharyi

Usually, the baseline survey is conducted on both the treatment and control groups prior to the project implementation. In case of the Myanmar rural development project, the control villages were selected during the first year of project implementation, and thus we could not conduct interviews for the pilot villages and control villages simultaneously.

For this reason, we first signed a contract with the Good Neighbors Myanmar branch to conduct the baseline survey for 100 pilot villages. In December 2015, we collected data for a census of 18,000 households through a household survey conducted in 100 pilot villages across nine regions. Through systematic random sampling method, we selected 5,500 households which is 30% of the total number of households and conducted the baseline survey on February 2016.[5)]

The Good Neighbors Myanmar branch, which conducted the baseline survey at that time, signed a contract to conduct a total of four surveys (one baseline, two midline, and one endline) for 100 pilot villages and survey costs for control villages were not included in the budget. The Development Research Team of KDI School of Public Policy and Management signed a contract with the Myanmar Survey Research (MSR), which provided consultation services when the Good Neighbor Myanmar Branch conducted the baseline survey for pilot villages. MSR also conducted the baseline survey for 3,000 households of 50 comparison villages (60 households per village).

There were discussions on how to coordinate the midline and endline data collections, given the different agencies conducting the baseline survey of 100 pilot villages and 50 control villages. We terminated the survey service contract with the Good Neighbors Myanmar Branch for 100 pilot villages and changed the contract with the MSR to conduct both the midline and endline surveys for 100 pilot villages and 50 control villages. MSR conducted the midline and endline surveys for 5,500 households in 100 pilot villages, and 3,000 households in 50 control villages (in total 8,500 households in 150 villages) in February 2018 and May 2019, respectively.

Through this, evaluation of Myanmar's rural community development project, which was based on a before and after comparison process evaluation and performance evaluation, could be developed into an impact evaluation setting by employing the difference-in-differences method. The difference-in-difference analysis compares the change from baseline to endline between the treatment and control groups.

Figure 1 visually describes the difference-in-difference analysis. It seems that the characteristics between treatment and comparison villages prior to the intervention are different. However, their slopes are parallel meaning that the treatment and comparison villages share the same trend. The effect of the intervention is calculated by subtracting the difference in changes between the treatment and comparison villages. The difference-in-difference method is widely used in impact evaluation studies in settings where RCT is not possible.

---

5) It is important to extract a representative sample that reflects the characteristics of the population. In a poll conducted before the US presidential election in 1936, Landon, then a Republican candidate, was expected to win a big vote over Roosevelt, but the result was the opposite. Poll was conducted from car and landline owners during the Great Depression, who were economically rich Republican supporters. If the sample is not representative of the population, it is difficult to infer the population parameter accurately from the sample statistics. In the Myanmar SMU Project Baseline Survey, representative samples could be extracted through census data collection as well as systematic random sampling. Choi, E. Seul, and Booyuel Kim. "A Beginner's Guide to Randomized Evaluations in Development Economics." Seoul Journal of Economics 29.4 (2016): 529-552.

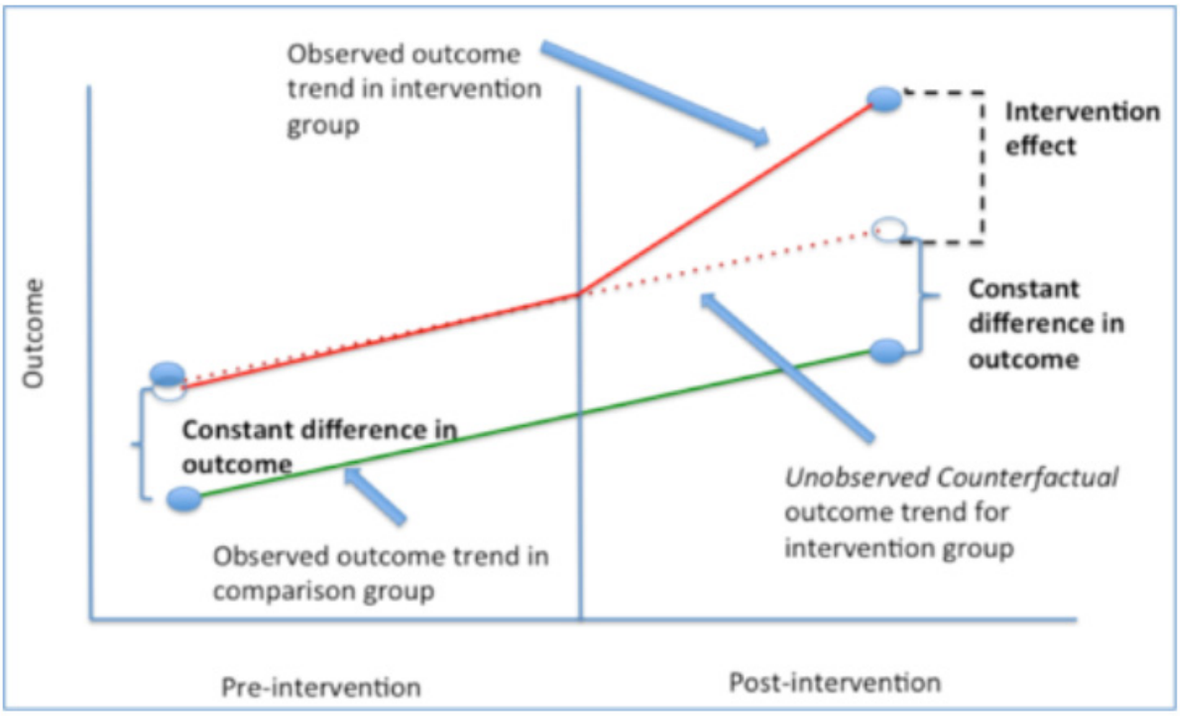


Figure 1. Example of Difference-in-Difference

In case of the Myanmar rural development project, we do not have information prior to the intervention, and thus it is not possible to test the parallel trend assumption[6] which is the key assumption for using difference-in-difference analysis. The endogenous selection of the 100 pilot villages and the ex-post selection of the comparison villages can be considered as the limitation of the Myanmar rural development project.

In order to overcome this limitation, the research team included a within village RCT component in order to explain the key mechanism of the Myanmar rural development project. First, we identified the inter-village competition structure as a characteristic of the Myanmar rural development project, which is clearly distinguished from the existing rural development projects (CDD). Then, we introduced two lab-in-the-field experiments – (i) Public Goods Game and (ii) Joint Investment Game. We randomly assigned the sampled households into two groups under each game. In February 2018, the public goods game was conducted on 8,500 households during the midline survey, and the joint investment game was conducted during the endline survey in May 2019. While the lab-in-the-field experiment is not an impact evaluation study that directly analyzes the effectiveness of a rural development project in Myanmar, the design allows us to examine the effect of the

6) Parallel trend assumption means that the treatment and comparison groups would have followed a same trajectory without the intervention/treatment.

core mechanism of Korean CDD projects (differentiated incentive system based on inter-village competition) under a rigorous randomized controlled trial (RCT) design.

Myanmar Rural Community-driven Development Project

Myanmar has the per capita income of US$ 1,326 (World Bank, 2018), making it one of the poorest countries in ASEAN. Myanmar has high income inequality between urban and rural areas, and suffer from poor rural environment due to lack of investment in the agricultural sector. Accordingly, the Myanmar government, together with the KOICA, implemented the Myanmar rural community development project of $ 22 million for a total of 5 years from 2014 based on the experience of the Saemaul Undong in South Korea.

In case of the Myanmar rural community development project, we set key performance indicators (KPI) in three areas: (i) capacity building project; (ii) village environment improvement project; (iii) income generation project. Then, we evaluate 100 villages every year and rank them from first to 100th.

The main performance indicators for the capacity building project were the number of capacity building meetings, number of training sessions, participants in training, and participants in excursions to A-ranking villages in other regions. The main performance indicators for the village environment improvement project were (i) residents' participation in the fund; (ii) provision of labor; (iii) land provision; and (iv) the number of households participating in the village environment improvement project. Lastly, the main performance indicators for the income generation project were (i) the increase of the village development fund; (ii) the participants in the micro-loans; and (iii) the number of new projects that were evaluated.

The performance of each village, measured through the key performance indicators for each project, was calculated annually and each village was ranked based on the calculation. Based on their ranking from the previous year, differential support was provided, which is the key characteristic of the Myanmar rural development project.

Table 3. Key Performance Indicators

Objective	Key Performance Indicators
1. Capacity Building	Number of meeting
	Number of technical/ educational training
	Number of trainee
	Number of villagers visit to other advanced villages
	Number of public information on project movement

Objective	Key Performance Indicators
2. Environment Improvement	% of project work completed in a year based on the original plan
	Villagers' fund contribution
	Villagers' labor contribution
	Number of participant households
	Villagers' land/ materials contribution
3. Income Generation	Fund increment by means of interest
	Number of microfinance participant households
	Adoption of new business and technologies

At the beginning of the first year of the project, all 100 villages received the same amount of $ 20,000 as the village development fund. Based on the performance of the first year, the top 30 villages were ranked A, the next 40 villages were ranked B, and the bottom 30 villages were ranked C. Based on this ranking, village development funds were differentially provided.

The top 30 villages, A-ranked villages, received $ 40,000, which is twice the first year's village development fund. The B-ranked villages received $ 30,000, an increase of $ 10,000 from the first year. The C-ranked villages received $ 20,000, the same amount as in the first year. After completing the second-year project, the village development fund was distributed in the same way in the third year.

Table 4. Differential Incentive System by Year

Year	Rank	Village Development Fund	Number of Villages	Total Budget
2016 (First Year)	-	$20,000	100	$2,000,000
2017 (Second Year)	A	$40,000	30	$1,200,000
	B	$30,000	40	$1,200,000
	C	$20,000	30	$600,000
2018 (Third Year)	A	$40,000	30	$1,200,000
	B	$30,000	40	$1,200,000
	C	$20,000	30	$600,000
2019	A	$15,000	30	$450,000
	B	$10,000	40	$400,000
	C	$5,000	30	$150,000
Total				$9,000,000

After the third year of implementation, the Ministry of Agriculture and Livestock of Myanmar and KOICA no longer managed the rural community development project, and individual villages voluntarily continued their village development project. In addition, a bonus incentive of $ one million was set up so that the third-year project could be carried out steadily and the rural community development project could be continued. In the third year, A-ranking villages receive an additional $ 15,000, B-ranking villages receive a $ 10,000 bonus, and C-ranking villages receive $5,000. 100 pilot villages participating in the rural development project receive a minimum of $ 65,000 and a maximum of $ 115,000 as village development fund from 2016 to 2019, and the total budget amounts to $ 9 million.

In summary, KOICA's Rural Development Project in Myanmar, based on the experience of Saemaul Undong in Korea, focused on (i) improving village leaders and community members' capacity, (ii) improving village environment such as roads and drinking water, and (iii) income generation activities through micro-loan projects. Besides, key performance indicators were set for each objective, 100 villages were objectively ranked based on the indicators, and differentiated incentives were provided based on each village's ranking. This inter-village competition system is a unique feature which distinguishes the Myanmar rural development project from other community-driven development projects.

Impact Evaluation Methodology

Potential Outcome Model

In the field of social science, the existing empirical studies often relies on simple correlation analysis, which not systematic nor rigorous. Accordingly, Leamer (1983) proposed a sensitivity analysis to examine if consistent results follow from different models and assumptions. However, this approach was insufficient to prove a causal relationship.[7)]

In the field of empirical economics since the late 1990s, many researchers recognized the importance of rigorous research design such as instrumental variables (IV) and randomized controlled trials (RCT) (Angrist and Pischke, 2010).

---

7) The sensitivity analysis proposed by Leamer examines if similar results are found after changing the specification or functional form.

Among study designs that demonstrate a rigorous causal relationship, the RCT method has received particular attention (Duflo and Kremer, 2005; Duflo et al. 2007). The randomized controlled trial method was already recognized as a rigorous research methodology for a long time in the medical field, and this research methodology was introduced in the social science field, especially in the economic field, in the late 1990s.

It is difficult to prove the causality of a specific project simply by comparing before and after the implementation. If we try to prove causality by comparing the people participating in the project and those not participating in the project, there could be a selection bias issue because the people who participated in the project may not share similar characteristics from those who did not participate. In order to prove a causal relationship, we need a "counterfactual" and Rubin (1974) explained this using the Potential Outcome Model.[8)]

The potential outcome model proposed by Rubin assumes the counterfactual outcome by looking at the treatment effect and the selection bias. First, an individual i can either be assigned to a treatment or not which is shown by $D_i = \{0, 1\}$. The outcome variable of interest is Y_i, and we are interested in the impact of the treatment (D_i) on Y_i. If an individual i received the treatment (Di = 1), the outcome can be denoted as Y_{1i}. If individual i did not receive the treatment (Di = 0), the outcome can be denoted as Y_{0i}.

<Equation 1> The treatment effect on i = $Y_{1i} - Y_{0i}$

In reality, individual i can only face one condition of either receiving the treatment or not. If an individual i receives the treatment, we will not be able to observe the counterfactual outcome which is Y_{0i}. Since we cannot observe both Y_{1i} or Y_{0i} at the same time, the equation will look as follows:

<Equation 2> $Y_i = Y_{0i} + (Y_{1i} - Y_{0i}) * D_i$

This is called the Fundamental Problem of Causal Inference. Since we cannot observe the counterfactual, if we compare the average outcomes for the treatment group and the control group, we will be looking at the following:

<Equation 3> $E[Y_i|D_i = 1] - E[Y_i|D_i = 0] = E[Y_{1i}|D_i = 1] - E[Y_{0i}|D_i = 0]$

8) Counterfactual shows the results that would have happened to participants if they have not participated in the program.

The problem in <Equation 3> is the difference between the treatment group ($D_i = 1$) and the control group ($D_i = 0$). In order to prove the causal impact of a project, all conditions apart from the treatment status has to be the same. In reality, since we are comparing different individuals, many factors can bias the result. In <Equation 3>, if we add and subtract the counterfactual term $E[Y_{0i} \mid D_i = 1]$ (results that would have happened to participants if they have not participated in the program), it does not affect the equation but allows us to differentiate the treatment effect from the selection bias as shown in <Equation 4>:

<Equation 4>
$$E[Y_{1i}|D_i = 1] - E[Y_{0i}|D_i = 0]$$
$$= E[Y_{1i}|D_i = 1] \mathbf{- E[Y_{0i}|D_i = 1] + E[Y_{0i}|D_i = 1]} - E[Y_{0i}|D_i = 0]$$
$$= \underline{E[Y_{1i} - Y_{0i}|D_i = 1]} + \underline{E[Y_{0i}|D_i = 1] - E[Y_{0i}|D_i = 0]}$$
$$= \underline{\text{Average treatment effect}} + \underline{\text{Selection bias}}$$

$E[Y_{1i}|D_i = 1] - E[Y_{0i}|D_i = 1]$ shows the actual treatment effect which is the difference between the outcomes for the treatment group when they received the treatment and the outcomes for the counterfactual. In reality, we cannot observe the outcome for the counterfactual ($E[Y_{0i}|D_i = 1]$) but only the outcome for the control group $E[Y_{0i}|D_i = 0]$, and the difference between these two terms ($E[Y_{0i}|D_i = 1] - E[Y_{0i}|D_i = 0]$) is called the selection bias. For this reason, if we calculate the difference in average values for the treatment and control groups, we will be calculating the average treatment effect together with the selection bias as shown in <Equation 4>.

Most empirical studies aim to disentangle the causal effect from the selection bias, and it is important to minimize the selection bias. The potential outcome model shows that an RCT can perfectly eliminate the selection bias. By randomly creating two groups from a large enough sample, there will be no difference in characteristics between the two groups. If we provide treatment to one of the two randomly assigned groups, all characteristics apart from the treatment status will be the same between the two groups and we will be able to observe a counterfactual group. Since there is no correlation between the treatment status (D_i) and the outcome variable, Y_{0i} and Y_{1i} are orthogonal to D_i. In this case, $E[Y_{0i}|D_i = 0]$, the second term of <Equation 3>, can be replaced with $E[Y_{0i}|D_i = 1]$, and we can come up with <Equation 5> in which the average treatment effect can be separated from the selection bias.

<Equation 5> $E[Y_{1i}|D_i = 1] - E[Y_{0i}|D_i = 0]$

$= E[Y_{1i}|D_i = 1] - E[Y_{0i}|\mathbf{D_i = 1}]$

$= E[Y_{1i} - Y_{0i}|D_i = 1]$

$= E[Y_{1i} - Y_{0i}]$ = Average treatment effect

As shown in <Equation 5>, researches based on RCTs are able to overcome the selection bias, which is one of the major barriers for causal inference. In an RCT-setting, the project impact can be evaluated by comparing the average difference between the treatment and control groups.[9)]

Baseline, Mid-line, and Endline Survey

In order to evaluate the impact of the Myanmar rural community development project, we conducted three rounds of survey including baseline, midline, and endline surveys. When KOICA signed a contract with the Korea Rural Community Corporation, the implementing agency for the rural development project in Myanmar, a total of four surveys of 100 villages were reflected in the budget. As described in Chapter 2, in order to conduct a rigorous impact evaluation of the Myanmar rural community development project, KOICA signed an MOU with the KDI School of Public Policy and Management and shared the evaluation budget to conduct three rounds of survey for 100 SMU villages and 50 control villages.

In December 2015, after conducting a household census for 100 project villages, 5,500 households (about 30% of the total 18,456 households) were randomly selected and a baseline survey was conducted in February 2016. The reason for conducting a household census prior to the baseline survey was to confirm that the sample of the baseline survey was representative of the population. As shown in Table 1, there is no statistical difference between the population (n = 18,456) and the sample (n = 5,515) in terms of household characteristics, occupation, land ownership, and asset ownership. This shows that the sample accurately reflects the characteristics of the population. However, the baseline survey for 100 projects villages was conducted after the first year of the implementation, which is a limitation of the research design.[10)]

---

9) For an ideal RCT setting, the following problems should not be faced: 1) non-random assignment of treatment; arbitrary changes in treatment status 2) refusal of receiving treatment status by treatment group 3) different attrition pattern between treatment and control groups 4) Hawthorne effect which causes changes in behavior due to the project

10) If there were positive effects right after the start of the first-year implementation, these effects should be neglected since we are examining the changes between the baseline and midline or endline. For this reason, the effect that happened between the beginning of the implementation (July 2015) and the baseline data collection (February 2016) are not reflected in the impact evaluation analysis and thus our results can be an underestimation or overestimation of the

Table 1: Assessment of sample representativeness

	Number of household			Occupation	Land	Household Asset			
	Total	Female	Single (dummy)	Non-farming (dummy)	Sown area (2013-14, acre)	Live-stock	Agricultural machine	Car or Motorcycle	Tailor machine
POPULATION (N = 18,456 households)									
Mean	4.01	2.07	0.04	0.50	2.90	12.78	0.19	0.01	0.002
(SD)	(1.67)	(1.12)	(0.20)	(0.50)	(5.85)	(107.56)	(0.55)	(0.14)	(0.05)
SAMPLE (n = 5,515 households)									
Mean	3.98	2.06	0.04	0.49	2.94	12.49	0.19	0.01	0.002
(SD)	(1.67)	(1.12)	(0.20)	(0.50)	(5.85)	(107.56)	(0.55)	(0.14)	(0.04)
T	-1.40	-0.90	-0.75	-0.93	0.41	-0.20	0.54	0.42	-0.53
(p-value)	(0.16)	(0.37)	(0.45)	(0.35)	(0.68)	(0.84)	(0.59)	(0.67)	(0.60)

Source: 2016 Census and Baseline Data from KOICA Saemaul Undong (SMU) Project in Myanmar
Notes: Standard deviations and p-values are reported in parentheses.

While preparing for the baseline survey of 100 villages, the research team discussed the selection of control villages with the Ministry of Agriculture, Livestock and Agriculture of Myanmar. In the Nay Pyi Taw region, which has a total of 40 project villages, a total of 16 control villages were selected from 3 townships. From Bago, Mon, Tanintharyi, and Yangon regions, each of which has 6 project villages, 3 control villages were selected from each region.

In Ayeyarwaddy, Mandalay, Sagaing, and Shan regions, there were 10 project villages in each region. 6 control villages were selected from Ayeyarwaddy and Shan regions, and 5 villages were selected from Mandalay and Sagaing regions. In December 2016, baseline survey was conducted for 3,000 households (60 households from each village).

If the project villages and control villages were randomly selected before the project started, the main characteristics between the two groups would have been similar on average. However, 100 project villages were selected prior to the selection of the control villages, and the difference in characteristics between the treatment and the control villages is inevitable. Table 2 shows the difference in means in terms of demographic and socio-economic status of households, and community characteristics between treatment and control villages.

No statistically significant difference was found between the two groups in terms of demographic characteristics, including female household head, household head's age, and

true effect.

marital status. However, the socio-economic status including household head's education level, employment status, land ownership status, household assets, electricity use, water pipe use, etc. was statistically significantly better in the treatment villages compared the control villages. Also, treatment villages were more likely to have a primary school and health facilities within the village compared to control villages. The fact that the project villages have a better environment in many ways than the control villages can create an overestimation bias in evaluating the effectiveness of the rural community development project. Considering the possibility of this overestimation, the characteristics of each village were controlled for in all regression analyses, and time-invariant village characteristics were controlled for by using the difference-in-difference method.

Table 2: Balance between Treatment and Comparison Villages

Variable	(1) Comparison Mean/SE	(2) Treatment Mean/SE	`(3) T-test P-value
Female household head	0.190	0.204	-0.014
	[0.007]	[0.005]	
Household head's age	50.394	50.691	-0.297
	[0.266]	[0.202]	
Marital Status	0.758	0.772	-0.014
	[0.008]	[0.006]	
Household head completed high school	0.023	0.033	-0.010***
	[0.003]	[0.002]	
Household head employed	0.726	0.786	-0.060***
	[0.008]	[0.006]	
Own land	0.411	0.449	-0.038***
	[0.009]	[0.007]	
Asset index	-0.073	0.040	-0.112***
	[0.028]	[0.022]	
Access to electricity	0.564	0.593	-0.029***
	[0.009]	[0.007]	
Have pipe water	0.120	0.338	-0.218***
	[0.006]	[0.006]	
Have primary school	0.804	0.860	-0.056***
	[0.007]	[0.005]	
Have hospital	0.224	0.309	-0.085***
	[0.008]	[0.006]	

Notes: The value displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 percent significant level.

After completing the baseline survey, a midline survey was conducted in February 2018 for a total of 8,500 households in 100 project villages and 50 control villages. During the midline survey, most of the information collected during the baseline survey

was repeatedly asked, and a module on women's leadership and behavioral experiments were conducted to measure social capital.

In order to analyze the impact of differential incentive system based on inter-village competition, one of the key mechanisms of the Myanmar rural community development project, on social capital, a public goods game which involves inter-village competition was introduced. Lastly, after the third year of project implementation, we conducted the endline survey in May 2019. During the endline survey, we collected the same information collected during the previous rounds of surveys, and also conducted another behavioral experiment to measure if inter-village competition improves joint investment with uncertainty.

In summary, the Myanmar rural community development project is the first among KOICA projects to systematically conduct a large-scale impact evaluation which involves three rounds of data collection. The first evaluation plan which was to conduct a before-and-after analysis without selecting control villages developed into a more rigorous difference-in-difference method by selecting control villages ex-post. Also, we were able to carry out an RCT-based impact evaluation by conducting two behavioral experiments during the midline and endline data collection.

WB Measuring Social Capital

In order to evaluate the effectiveness of the rural community development project in Myanmar, we aimed to analyze the increase of social capital in the villages as a short-term outcome and the increase of household income as a mid- to long-term outcome. We used the survey questionnaire from “Measuring Social Capital” developed by the World Bank (Grootaert et al. 2002; Grootaert et al. 2004) to measure social capital. In particular, we asked questions related to 1) Groups and Networks, 2) Trust and Solidarity, 3) Collective Action and Cooperation, 4) Information and Communication, and 5) Social Cohesion and Inclusion.

Difference-in-Differences

The impact evaluation study of the Myanmar rural community development project applies the difference-in-differences method to identify the program’s causal impact. [11] Difference-in-difference is a methodology widely used in social science in order to

11) For more information on difference-in-difference strategy, refer to Gertler et al. (2016).

rigorously identify the causal relationship. For the difference-in-difference method, we first need to identify the control and treatment groups and compare the before-and-after changes of key outcome variables (including level of social capital and household income) between the treatment and control groups. The first difference is comparing the before and after, and the second difference is comparing the treatment and control groups.

The key assumption of difference-in-difference strategy is that the treatment group follows a similar trajectory compared to the control group prior to the intervention, even if the baseline characteristics of the treatment and control groups are different. By satisfying this assumption, we can control for time-varying trends that are commonly applied to the treatment group and the control group as well as time-invariant differences between the treatment group and the control group. Thus, the causal effect of the policy or program can be identified.

The regression equation for the difference-in-difference method is as follows. is the outcome variable for individual i, in village j, at time period t, is a dummy variable that equals to 1 if individual i lives in a treatment village. is a dummy variable that equals to 0 for baseline value and 1 for post-intervention value. is a control vector that includes the demographic and socio-economic characteristics of the respondent.

$$Y_{ijt} = \alpha + \beta_1 Treatment_j + \beta_2 Post_t + \boldsymbol{\beta_3} Treatment_j \times Post_t + \gamma X_{ij} + \epsilon_{ijt} \quad (1)$$

Coefficient shows the difference between treatment and control groups, and coefficient shows the difference between before and after the intervention. We are primarily interested in the value for , the coefficient for the interaction term between and . If the Myanmar rural community development project had a positive impact on social capital and income, the coefficient will be statistically significant.

Since we conducted three rounds of survey for the Myanmar rural community development project, we include midline and endline dummies instead of a post dummy, and each of these dummies are interacted with the treatment dummy. In sum, we examine the short-term impact of the project by looking at - the interaction term between treatment and midline dummies, and the long-term impact by looking at – the interaction term between treatment and endline dummies.

$$Y_{ijt} = \alpha + \beta_1 Treatment_j + \beta_2 Midline_t + \beta_3 Endline_t + \boldsymbol{\beta_4} Treatment_j \times Midline_t +$$

$$\boldsymbol{\beta_5} Treatment_j \times Endline_t + \gamma X_{ij} + \epsilon_{ijt} \quad (2)$$

Lab-in-the-Field Experiments

The impact evaluation of the Myanmar rural community development project includes the difference-in-difference approach that compares the average change over time in the treatment and control groups, as well as an randomized control experiment (RCT) component by conducting behavioral experiments to measure the impact of the inter-village competition. Two types of behavioral experiments were conducted – (i) public goods experiment during the midline survey; and (ii) joint investment experiment during the endline survey.

When measuring trust and collective action, the core concept of social capital, with self-reported questionnaires, a social desirability bias may occur in a socially desirable direction. In order to more closely measure social capital, which is a key outcome variable of this project, a behavioral experiment was introduced to measure trust and collective action through individual's action instead of self-reported answers. The public goods game measures how much individuals donate for public goods of their community in the presence of free riding incentives. The joint investment experiment measures whether an individual will invest in a joint investment project when the success probability of the project depends on the number of participants.

The public goods game is described in detail in Appendix 1. During the midline survey, 5,000 kyat was distributed to survey participants and they were asked to make a donation out of the 5,000 kyat for their village. We handed out two envelopes - one envelope with a "you" sign with 5,000 kyat, and another with a "village" sign which was empty. After making the donation to the village envelope, we asked the survey participants to hand in the village envelope to the enumerators. In case survey participants did not donate any amount, they were allowed to hand in an empty envelope to the enumerators. Since respondents could face social pressure if they make decisions in front of the enumerators, we asked the respondents to make the decision in a separate room. We randomly selected half of the survey participants, and conducted inter-village public goods game. Similar to the evaluation method of the Myanmar rural community development project, based on the amount of average donation 100,000 kyat was provided to the top 50 villages, and 50,000 kyat was provided to the next 50 villages. We analyzed whether inter-village competition affects decisions to donate for public goods.

For the joint investment experiment, we created groups of 14 participants in each village and asked if they would like to invest in the joint investment project. Participants

receive 2,000 kyat, and if they decide not to participate in the joint investment project, they can keep the endowment for themselves. If the participant decides to participate in the joint investment project, they will have a chance to receive 4,000 kyat depending on the success probability. If the project fails, they lose the initial endowment of 2,000 kyat. As shown in Figure 3, the success probability of the joint investment project depends on the number of participants in their group that decide to invest in the project. If no one decides to participate in the project, the success probability is zero over 25 (or 0%), If all 14 participants decide to invest, the success probability is 14 over 25 (which equals to 56%). If all participants decide to invest under an uncertain circumstance, the expected return from investing in the joint investment project (2,240 kyat) exceeds the return from not investing (2,000 kyat).

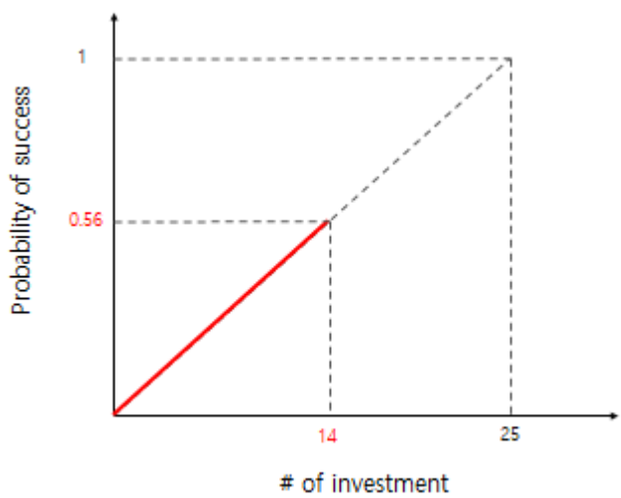


Figure 3. Success Probability of Joint Investment Project

When individuals with credit constraints are unable to start new businesses, joint investments based on mutual trust and cooperation can help overcome the existing constraints and promote new businesses to increase income. Joint investment is one of the key mechanisms for income generation in rural communities. Since individuals face uncertainties when investing in a joint project, trust and collective action among members are important and the joint investment experiment is designed to measure this social capital.

Similar to the public goods experiment, the top 50 villages with the highest number of investors in the joint investment experiment receive 100,000 kyat as incentives, and the next 50 villages receive 50,000 kyat which can be used for village development. We examine the impact of inter-village competition on the likelihood to invest in a joint investment project with uncertainty.

Results

Importance of Initial Conditions

Before examining the impact of the Myanmar rural community development project, this report examines the correlation between the initial conditions of 100 treatment villages prior to the intervention and the success implementation of the project. Based on the social capital information of each village collected during the baseline survey, we created three social capital indices including (i) aggregate level of trust; (ii) level of collective action; and (iii) level of social cohesion. Table 5.1.1 shows the impact of these initial conditions on project success.

We find that one standard deviation increase in trust level increases the probability of being selected as A-ranked villages (top 30 villages) by 22.5 percentage point and decreases the probability of being selected as C-ranked villages (bottom 30 villages) by 18/2 percentage point. We find similar results for collective action as well as social cohesion.

Table 5.1.1: Impact of Social Capital on CDD Performance

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	**A-Ranked Village**			**C-Ranked Village**		
Panel A:						
Aggregate index of trust	0.170**	0.182**	0.225**	-0.174**	-0.169**	-0.182**
	(0.069)	(0.079)	(0.089)	(0.075)	(0.083)	(0.092)
Basic Controls	No	Yes	Yes	No	Yes	Yes
Socio-economic Status	No	No	Yes	No	No	Yes
Observations	100	100	100	100	100	100
Panel B:						
Aggregate index of collective action	0.355***	0.377**	0.403**	-0.297**	-0.295**	-0.281**
	(0.132)	(0.149)	(0.166)	(0.118)	(0.131)	(0.141)
Basic Controls	No	Yes	Yes	No	Yes	Yes
Socio-economic Status	No	No	Yes	No	No	Yes
Observations	100	100	100	100	100	100
Panel C:						
Aggregate index of social cohesion	0.168	0.217	0.254*	-0.257**	-0.291**	-0.330**
	(0.132)	(0.142)	(0.152)	(0.124)	(0.133)	(0.143)
Basic Controls	No	Yes	Yes	No	Yes	Yes
Socio-economic Status	No	No	Yes	No	No	Yes
Observations	100	100	100	100	100	100

Notes: Basic controls include (i) number of households in village; (ii) village population size; (iii) percentage of household's part of major ethnic group; (iv) percentage of female-headed households; (v) percentage of married household head; (vi) percentage of Buddhist household head; and (vii) length of residency. Socio-economic status includes (i) percentage of household head with at least high school education; (ii) percentage of household head employed; (iii) percentage of household head working as farmer; (iv) percentage of household owning land; (v) monthly income.

Similarly, villages with higher level of social capital are more likely to receive “A” for two consecutive years, while those villages with lower social capital are more likely to receive “C” for two consecutive years. One standard deviation increase in trust level is associated with 15.8 percentage point increase in the probability of being selected as A-ranked villages for two consecutive years, and a 10.7 percentage point decrease in the probability of being selected as C-ranked villages for two consecutive years. We find stronger impact for collective action. One standard deviation increase in collective action level is associated with 23.4 percentage point increase in the probability of being selected as A-ranked villages for two consecutive years and 34.6 percentage point decrease in the probability of being selected as C-ranked villages for two consecutive years. Since A-ranked villages in the first year are also likely to receive A-ranking in the second year, we see similar results for Table 5.1.1 and Table 5.1.2.

Table 5.1.2: Social Capital on Performance of AA/CC Villages

	(1)	(2)	(3)	(4)	(5)	(6)
		AA Villages			CC Villages	
Panel A:						
Aggregate index of trust	0.126*	0.140*	0.158*	-0.122***	-0.111*	-0.107*
	(0.0691)	(0.0755)	(0.0803)	(0.0429)	(0.0562)	(0.0631)
Basic controls		o	o		o	o
Socio-economic status			o			o
Observations	100	100	100	100	100	100
Panel B:						
Aggregate index of collective action	0.201**	0.223**	0.244**	-0.313***	-0.318***	-0.283**
	(0.0930)	(0.0998)	(0.103)	(0.109)	(0.111)	(0.116)
Basic controls		o	o		o	o
Socio-economic status			o			o
Observations	100	100	100	100	100	100
Panel C:						
Aggregate index of social cohesion	0.212**	0.236**	0.234**	-0.278*	-0.296**	-0.346***
	(0.0883)	(0.100)	(0.111)	(0.141)	(0.137)	(0.126)
Basic controls		o	o		o	o
Socio-economic status			o			o
Observations	100	100	100	100	100	100

Notes: Basic controls include (i) number of households in village; (ii) village population size; (iii) percentage of household’s part of major ethnic group; (iv) percentage of female-headed households; (v) percentage of married household head; (vi) percentage of Buddhist household head; and (vii) length of residency. Socio-economic status includes (i) percentage of household head with at least high school education; (ii) percentage of household head employed; (iii) percentage of household head working as farmer; (iv) percentage of household owning land; (v) monthly income.

However, as shown in Table 5.1.3 self-reported level of social capital is not correlated with villages that received C in the first year but improved to B or A in the second year or villages that received A in the first year but downgraded to B or C in the second year. This finding suggests that while initial conditions are important for project success, other factors such as leadership, teamwork, and governance can help overcome the unfavorable initial conditions.

Table 5.1.3: Social Capital on Improvement or Downgrading of Village Performance

	(1)	(2)	(3)	(4)	(5)	(6)
	Improving Villages (C to B or A)			Downgraded Villages (A to B or C)		
Panel A:						
Aggregate index of trust	-0.0206	-0.0172	-0.0518	0.0476	0.0294	0.0492
	(0.0477)	(0.0571)	(0.0658)	(0.0464)	(0.0460)	(0.0467)
Basic controls		o	o		o	o
Socio-economic status			o			o
Observations	100	100	100	100	100	100
Panel B:						
Aggregate index of collective action	-0.00366	0.0164	-0.0265	0.107*	0.0607	0.0437
	(0.0752)	(0.0799)	(0.0867)	(0.0567)	(0.0573)	(0.0611)
Basic controls		o	o		o	o
Socio-economic status			o			o
Observations	100	100	100	100	100	100
Panel C:						
Aggregate index of social cohesion	0.0134	0.0169	0.0353	-0.0459	-0.0352	-0.00540
	(0.0524)	(0.0666)	(0.0684)	(0.118)	(0.103)	(0.0972)
Basic controls		o	o		o	o
Socio-economic status			o			o
Observations	100	100	100	100	100	100

Notes: Basic controls include (i) number of households in village; (ii) village population size; (iii) percentage of household's part of major ethnic group; (iv) percentage of female-headed households; (v) percentage of married household head; (vi) percentage of Buddhist household head; and (vii) length of residency. Socio-economic status includes (i) percentage of household head with at least high school education; (ii) percentage of household head employed; (iii) percentage of household head working as farmer; (iv) percentage of household owning land; (v) monthly income.

DD Estimation Results

By analyzing the three waves of data using the difference-in-difference strategy, we examine the impact of the Myanmar rural community development project on social capital and income generation. In order to examine the impact of the project on the level of trust, we used 5-likert scale variables including (i) most people who live in this village can be

trusted; (ii) in this village, it is unlikely someone will take advantage of you; (iii) trust in strangers; (iv) trust in local government officials; (v) trust in central government officials; and (vi) level of trust in this village improved. The interaction term between the midline dummy and treatment dummy shows the impact at the midline, and the interaction term between the endline dummy and treatment dummy shows the impact at the endline.

According to Table 5.2.1, while there are no changes in level of trust among village members (column 1-3), there is an increase in trust level of local and central government officers (column 4-5). This finding suggests the need for having a close relationship with local and central officers (including MOALI) for successful implementation of the project. The average trust level within the village (column) has increased by 0.199 standard deviation at midline compared to the baseline, and by 0.139 standard deviation at endline compared to the baseline. This shows that there has been an increase in trust level throughout the project implementation.

Table 5.2.1: Trust in Different People

	(1)	(2)	(3)	(4)	(5)	(6)
	Most people who live in this village can be trusted.	In this village, it is unlikely someone will take advantage of you.	Trust in strangers	Trust in local government officials	Trust in central government officials	Level of trust in this village improved.
Midline * SMU	-0.008	0.014	0.017	0.068***	0.091***	0.199***
	(0.012)	(0.021)	(0.011)	(0.020)	(0.017)	(0.032)
Endline * SMU	-0.026*	0.000	0.006	0.059***	0.106***	0.139***
	(0.014)	(0.021)	(0.019)	(0.019)	(0.017)	(0.037)
SMU	0.030**	0.015	-0.018	-0.057***	-0.102***	0.001
	(0.012)	(0.014)	(0.011)	(0.016)	(0.014)	(0.028)
Midline	0.045***	-0.017	0.038***	0.020	0.020	-0.100***
	(0.012)	(0.020)	(0.011)	(0.016)	(0.014)	(0.027)
Endline	0.071***	-0.078***	0.130***	0.030*	0.027*	0.014
	(0.012)	(0.020)	(0.015)	(0.017)	(0.015)	(0.031)
Basic Controls	O	O	O	O	O	O
Region Fixed Effect	O	O	O	O	O	O
Constant	0.881***	0.772***	0.116***	0.863***	0.878***	0.478***
	(0.017)	(0.032)	(0.027)	(0.031)	(0.031)	(0.037)
Observations	25,361	25,361	25,361	25,361	25,361	25,361
R-squared	0.021	0.016	0.028	0.028	0.036	0.047

Notes: For column (1) ~ (5), 5-Likert scale variables are converted into dummy variables. Control variables include female-headed household, marital status of household head, household head's religion, education level of household head, land ownership, and residency length. Region fixed effects are included and standard errors are clustered at village-level.

In Table 5.2.2, we examine the impact of the Myanmar rural community development project on collective action. In order to measure the level of collective action, we ask respondents the following questions - (i) in the past 12 months, if they have worked with others in your village/neighborhood to do something for the benefit of the community; (ii) if more than half of people in this village/neighborhood contribute time or money toward common development; and (iii) if there was a water supply problem in this community, how likely it is that people will cooperate to try to solve the problem. While we do not find any statistically significant impact on collective action, we find that village members living in treatment villages are more likely to contribute their time and money for their village development by 0.085 standard deviation compared to those living in control villages. However, this impact disappears in the endline.

Table 5.2.2: Collective Action

	(1)	(2)	(3)
	In the past 12 months, have you worked with others in your village/neighborhood to do something for the benefit of the community?	More than half of people in this village/neighborhood contribute time or money toward common development	If there was a water supply problem in this community, how likely is it that people will cooperate to try to solve the problem?
Midline * SMU	0.013	0.085***	0.004
	(0.013)	(0.021)	(0.010)
Endline * SMU	0.008	0.022	-0.004
	(0.013)	(0.024)	(0.012)
SMU	0.009	0.037**	0.024***
	(0.011)	(0.015)	(0.007)
Midline	0.009	-0.097***	0.002
	(0.014)	(0.021)	(0.011)
Endline	-0.008	-0.055***	0.001
	(0.013)	(0.020)	(0.013)
Basic Controls	O	O	O
Region FE	O	O	O
Constant	0.902***	0.789***	0.911***
	(0.033)	(0.031)	(0.015)
Observations	24,522	25,361	25,361
R-squared	0.027	0.031	0.011

Notes: For column (3), 5-Likert scale variable is converted into a dummy variable. Control variables include female-headed household, marital status of household head, household head's religion, education level of household head, land ownership, and residency length. Region fixed effects are included and standard errors are clustered at village-level.

In Table 5.2.3, we look at the impact of the project on social cohesion. Specifically, we investigate its impact on (i) how strong the feeling of togetherness or closeness in their village/neighborhood is; (ii) if any differences cause problems; and (iii) if there are any community activities in which they are not allowed to participate. We find that the project did not have any impact on social cohesion.

Table 5.2.3: Social Cohesion

	(1)	(2)	(3)
VARIABLES	How strong is the feeling of togetherness or closeness in your village/neighborhood?	Do any differences cause problems?	Are there any community activities in which you are not allowed to participate?
Midline * SMU	-0.003	-0.013	0.003
	(0.006)	(0.024)	(0.003)
Endline * SMU	-0.009	0.004	0.007
	(0.008)	(0.018)	(0.004)
SMU	0.016***	-0.020*	-0.003**
	(0.005)	(0.011)	(0.001)
Midline	0.025***	0.114***	-0.013***
	(0.007)	(0.022)	(0.003)
Endline	0.016*	0.047***	-0.020***
	(0.008)	(0.017)	(0.005)
Constant	0.933***	0.058***	0.992***
	(0.012)	(0.022)	(0.004)
Basic Controls	O	O	O
Region FE	O	O	O
Observations	25,361	25,361	25,361
R-squared	0.005	0.037	0.006

Notes: For column (1), 5-Likert scale variable is converted into a dummy variable. Control variables include female-headed household, marital status of household head, household head's religion, education level of household head, land ownership, and residency length. Region fixed effects are included and standard errors are clustered at village-level.

In Table 5.2.4, we examine if the project improves the availability of public goods in the village. We examined the availability of (i) garbage collection service; (ii) public sewage system; (iii) public standpipe; and (iv) public transport system. Since garbage collection and public sewage systems were part of the improving environment projects, we see a large impact on the availability of these two services as expected. The availability of garbage collection service increased by 0.263 standard deviation at the midline, and by 0.299 standard deviation at the endline. The availability of public sewage system increased by 0.33 standard deviation at the midline, and by 0.22 standard deviation at the endline. Many villages also reported to have installed public water tanks but we do not see a

statistically significant impact. Finally, public transport system was not part of the rural community development project and thus we see statistically insignificant impact with coefficient close to 0.

Table 5.2.4: Provision of Public Goods

	(1) Garbage Collection Service	(2) Public Sewage System	(3) Public Standpipe	(4) Public Transport System
Midline * SMU	0.263***	0.330***	0.049	-0.000
	(0.043)	(0.041)	(0.048)	(0.075)
Endline * SMU	0.299***	0.220***	-0.037	-0.009
	(0.076)	(0.058)	(0.049)	(0.111)
SMU	0.026	0.003	0.122***	0.163**
	(0.017)	(0.007)	(0.030)	(0.072)
Midline	0.022	0.052**	0.058*	-0.049
	(0.016)	(0.021)	(0.033)	(0.059)
Endline	0.170***	0.279***	-0.001	0.061
	(0.054)	(0.048)	(0.032)	(0.091)
Constant	-0.108	-0.068	-0.068*	0.163
	(0.077)	(0.067)	(0.038)	(0.130)
Basic Controls	O	O	O	O
Region FE	O	O	O	O
Observations	25,361	25,361	25,361	25,361
R-squared	0.250	0.247	0.089	0.081

Notes: The dependent variables in column (1) – (3) ask the fraction of community served by the service and the variables are converted into dummy variables so that 1 equals to most of the community being served by the service. Control variables include female-headed household, marital status of household head, household head's religion, education level of household head, land ownership, and residency length. Region fixed effects are included and standard errors are clustered at village-level.

Similarly, the project did not aim to increase the availability of schools or hospitals, and thus as shown in Table 5.2.5, we do not see any impact on availability of schools or hospitals.

Table 5.2.5: Availability of Community Infrastructure

	(1) Primary School	(2) Middle School	(3) High School	(4) Hospital
Midline * SMU	-0.066	-0.070	-0.037	-0.028
	(0.042)	(0.067)	(0.029)	(0.068)
Endline * SMU	-0.042	0.013	0.033	-0.019
	(0.093)	(0.096)	(0.061)	(0.111)
SMU	0.054	0.029	-0.032	0.075
	(0.062)	(0.075)	(0.044)	(0.075)
Midline	0.193***	0.087	0.069**	0.213***
	(0.050)	(0.059)	(0.032)	(0.056)
Endline	0.090	-0.029	0.001	0.185**
	(0.089)	(0.083)	(0.054)	(0.092)
Constant	0.795***	0.046	-0.031	0.509***
	(0.073)	(0.084)	(0.051)	(0.116)
Basic Controls	O	O	O	O
Region FE	O	O	O	O
Observations	25,361	25,361	25,361	25,361
R-squared	0.042	0.062	0.060	0.056

Notes: The dependent variables in all columns are dummy variables asking if their community has the specified facility available within their community. Control variables include female-headed household, marital status of household head, household head's religion, education level of household head, land ownership, and residency length. Region fixed effects are included and standard errors are clustered at village-level.

In Table 5.2.6, we examine how the project affected the environment of the villages. There was an increase in availability of employment by 31 percentage point at midline, and by 20.4 percentage point at endline (Column 1). There was an improvement in condition of roads by 20.2 percentage point at midline and there was no statistically significant change at endline (Column 2). Most villages focused on improving road conditions during the first two years of project implementation, and allocated more budget for income generation activities during the second and third year of project implementation. This implementation pattern is shown in our data – we see clear impact on condition of roads at the midline, and large improvement in housing conditions at the endline. The quality of housing improved by 48 percentage point at midline, and by 35.8 percentage point at endline. Lastly, the percentage of respondents answering that their overall quality of life improved increased by 47.5 percentage point at midline and by 33.8 percentage point at endline. These findings confirm the effectiveness of the living environment improvement interventions as part of the Myanmar rural community development project.

Table 5.2.6: Impact on Community Characteristics

	(1) Availability of employment	(2) Condition of roads	(3) Quality of housing	(4) Overall quality of life
Midline * SMU	0.310***	0.202**	0.480***	0.475***
	(0.070)	(0.095)	(0.056)	(0.062)
Endline * SMU	0.204**	0.093	0.358***	0.338***
	(0.090)	(0.103)	(0.073)	(0.070)
SMU	0.191***	0.121	-0.064	0.023
	(0.059)	(0.084)	(0.052)	(0.049)
Midline	0.256***	0.641***	0.197***	0.108*
	(0.063)	(0.080)	(0.060)	(0.056)
Endline	0.367***	0.785***	0.467***	0.347***
	(0.090)	(0.091)	(0.075)	(0.067)
Constant	3.168***	3.592***	3.581***	3.530***
	(0.091)	(0.098)	(0.084)	(0.070)
Basic Controls	O	O	O	O
Region FE	O	O	O	O
Observations	25,361	25,361	25,361	25,361
R-squared	0.099	0.182	0.165	0.122

Notes: The dependent variables of columns (1) ~ (4) are 5-Likert scale variables and are converted into dummy variables. Each dummy variable equals to 1 when the respondents answerd ‘improved’ or ‘strongly improved’. Control variables include female-headed household, marital status of household head, household head’s religion, education level of household head, land ownership, and residency length. Region fixed effects are included and standard errors are clustered at village-level.

The main outcome variable for the Myanmar rural community development project is income generation. The major activity for income generation was microfinance. Village members of treatment villages started different income generation activities by borrowing micro-loans. Table 5.2.7 shows that at midline access to microfinance increased by 48.5 percentage point and by 35.2 percentage point at endline. While there was no significant impact on employment, household income increased by 22.3 percentage point at midline and by 23.9 percentage point at endline. These results show that the income generation project had an impact of greatly improving household income, and the results are significant throughout the midline as well as endline.

Table 5.2.7: Impact on Income Generation

	(1) Access to microfinance	(2) Employed	(3) Log of income
Midline * SMU	0.485***	-0.029	0.223***
	(0.051)	(0.029)	(0.052)
Endline * SMU	0.352***	-0.049	0.239**
	(0.046)	(0.031)	(0.095)
SMU	-0.266***	0.075***	-0.030
	(0.041)	(0.013)	(0.059)
Midline	-0.270***	-0.396***	0.174***
	(0.049)	(0.029)	(0.055)
Endline	0.030	-0.349***	0.116
	(0.047)	(0.0271)	(0.085)
Constant	0.648***	0.683***	6.935***
	(0.050)	(0.035)	(0.088)
Basic Controls	O	O	O
Region FE	O	O	O
Observations	25,361	25,361	21,139
R-squared	0.143	0.133	0.090

Notes: The dependent variable in column (1) is whether the household had access to microfinance, village credit union or financial cooperative such as ROSCA (Rotating Saving and Credit Association) in their village or in the neighboring villages in the past 12 months. The dependent variable in column (2) is whether the household head is currently employed. The dependent variable in column (3) is the log of total income of the household including regular and seasonal income.

In summary, the rural community development project in Myanmar had an impact of increasing level of social capital, and the availability of public goods including garbage collection services and public sewage systems. The overall quality of life also greatly improved and household income also increased. This result shows that the project was successful in meeting the initial project objectives. Due to the limitation of the research design, it is impossible to show perfect causation of the project. At the same time, we control for time-invariant variables in our analysis, and thus the results can be considered as robust impact evaluation findings.

Lab-in-the-Field Results

For the analysis of the behavioral experiments results, we will be following the pre-analysis plan and analyze the Myanmar results together with the Cambodia results. In this report, we will be looking at the results of the public goods game conducted during the midline survey.

The overall impact evaluation of the Myanmar rural community development project was conducted with a difference-in-difference analysis comparing the treatment villages and

the control village. Considering the limitations of the research design, we also introduced an RCT-based behavioral experiments to analyze the impact of the differential incentive system on social capital. We randomly assigned the households in both the treatment and control villages into two groups – (i) competition group where we introduce inter-village competition component during the behavioral experiments; and (ii) non-competition group.

The first step in analyzing an RCT-based study is to determine whether the mean characteristics of the treatment and control groups are balanced. Table 5.3.1 shows that the treatment and comparison groups of the public goods game have similar characteristics on average. Column 3 shows that the treatment and control groups are balanced in terms of (i) female-headed households; (ii) marital status; (iii) education level of household head; (iv) ethnicity; (v) religion; (vi) land ownership; (vii) length of residency; (viii) employment status of household head; (ix) household head as farmer; and (x) asset index. The percentage of household head with at least primary school education is slightly higher in the treatment group (31.3%) compared to the (29.4%). Similarly, Table 5.3.2 shows that the treatment and comparison groups of the joint investment game have similar characteristics on average.

Table 5.3.1: Randomization Balance: Public Goods Experiment

	(1)	(2)	(3)
	Non-Competition	Competition	T-Test
Variable	Mean/SE	Mean/SE	Coefficient/SE
Female-Headed Household	0.531	0.534	0.00238
	[0.013]	[0.013]	(0.0108)
Married Household Head	0.763	0.776	0.0121
	[0.008]	[0.008]	(0.00913)
Household Head with at least primary school education	0.294	0.313	0.0189*
	[0.015]	[0.014]	(0.00997)
Household Head as Major Ethnicity	0.866	0.864	-0.00247
	[0.026]	[0.026]	(0.00740)
Buddhist Household Head	0.971	0.973	0.00219
	[0.009]	[0.008]	(0.00357)
Household owning land	0.463	0.473	0.0101
	[0.018]	[0.018]	(0.0108)
Length of residency over 45 years	0.436	0.431	-0.00511
	[0.012]	[0.012]	(0.0107)
Household Head Employed	0.581	0.587	0.00671
	[0.016]	[0.016]	(0.0107)
Household Head as Farmer	0.301	0.310	0.00908
	[0.015]	[0.016]	(0.00998)
Asset Index	-0.010	0.010	0.0200
	[0.072]	[0.070]	(0.0353)

Table 5.3.2: Randomization Balance: Joint Investment Experiment

Variable	(1) Control Mean/SE	(2) Competition Mean/SE	(3) T-Test Coeff./SE
Female-Headed Household	0.491	0.490	-0.000892
	[0.014]	[0.016]	(0.0134)
Married Household Head	0.790	0.791	0.00188
	[0.008]	[0.010]	(0.0109)
Household Head with at least primary school education	0.299	0.311	0.0121
	[0.012]	[0.016]	(0.0123)
Household Head as Major Ethnicity	0.835	0.841	0.00634
	[0.028]	[0.026]	(0.00988)
Buddhist Household Head	0.979	0.972	-0.00629
	[0.010]	[0.010]	(0.00405)
Household owning land	0.497	0.515	0.0181
	[0.018]	[0.019]	(0.0134)
Length of residency over 45 years	0.478	0.469	-0.00962
	[0.013]	[0.015]	(0.0134)
Household Head Employed	0.621	0.634	0.0135
	[0.015]	[0.019]	(0.0130)
Household Head as Farmer	0.124	0.133	0.00917
	[0.010]	[0.011]	(0.00892)
Asset Index	-0.005	0.014	0.0188
	[0.066]	[0.074]	(0.0443)

Table 5.3.3 shows that the impact of inter-village competition is limited. The coefficient for the competition dummy is 0.00483 (column 2) which is close to 0 and insignificant. While the percentage of donation for the non-competition group in comparison villages is 65.5 percent, the percentage of donation is higher in the SMU villages by 14.6 percentage point (22.3%). This implies that the level of social capital in the SMU villages is higher than that in the comparison villages which is an indirect evidence of the impact of the Myanmar rural community development project on social capital.

Similarly, the inter-village competition does not have any significant impact on investment decision during the joint investment game (Column 4). At the same time, households in the SMU villages are 1.96 percentage point more likely to invest in the joint investment game compared to households in the comparison villages. In case of the joint investment experiment, most of the survey participants (93.3%) decided to invest during the experiment and there is limited room for the inter-village competition.

Table 5.3.3: Impacts of Inter-village Competition on Public Goods and Joint Investment

	(1)	(2)	(3)	(4)
	Village Donation (%)		**Decided to Invest**	
Competition	0.00402	0.00483	0.0141**	-0.000658
	(0.00550)	(0.0101)	(0.00565)	(0.0128)
SMU		0.146***		0.0194**
		(0.0227)		(0.00906)
Competition * SMU		-0.00123		0.0223
		(0.0121)		(0.0141)
Observations	8,515	8,515	8,371	8,371
R-squared	0.080	0.127	0.010	0.013
Mean of dependent variable	0.755	0.655	0.945	0.933

Robust standard errors are in parentheses. Control variables include (i) ethnicity of a household head; (ii) female-headed household; (iii) married household head; (iv) Buddhist household head; (v) length of residency over 45 years; (vi) household head with at least high school education; (vii) household head employed; (viii) household head working as a farmer; (ix) household owning land; (x) asset index; (xi) community has access to market; (xii) community has public transport system; (xiii) community has primary school; and (xiv) community has hospital. *** p<0.01, ** p<0.05, * p<0.1

To summarize the results of the behavioral experiment, the inter-village competition does not significantly affect the donation made during the public goods experiment and the investment decision during joint investment experiment. Due to the high giving culture of Myanmar, it is important to consider that there is limited room for the impact of competition on the percentage of donation or decision to invest.

In case of SMU villages, the percentage of donation to the village joint fund and the percentage investing in joint investment project under uncertainty was statistically significantly higher than that of the control village. It can be interpreted as evidence that the level of social capital is higher in SMU villages than control villages. Lastly, the behavioral experiments for designed for two countries including Myanmar and Cambodia. In the Pre-Analysis Plan, the research team planned to analyze both Cambodia and Myanmar. While the lack of impact of the inter-village competition in Myanmar may have resulted from the high level of social capital in the country (the ceiling effect), we may expect positive impact of inter-village competition in Cambodia due to the low level of social capital in the country. While we have not included the results for Cambodia in this report, there is a positive impact of inter-village competition on the percentage of donation and decision to invest. The impact of inter-village competition was especially shown among SMU villages possibly since households in the SMU villages have experienced differential incentive system based on inter-village competition.

Discussion

The Myanmar rural community development project is the largest impact evaluation study implemented by KOICA. At the same time, the impact evaluation design suffers from some limitations, and this section provides suggestions for future impact evaluation studies.

Random selection of project villages

When discussing the master plan with the recipient country regarding the implementation of a development project, different decisions need to be made including the selection of project villages. Ideally, selection of recipient households should be based on humanitarian perspective. However, political, economic, cultural and social factors are considered when deciding the project villages. For this reason, it is difficult to argue for random selection of project villages for a rigorous impact evaluation. At the same time, many recipient countries are interested in a rigorous evaluation of a project in order to expand and continue development projects.

When discussing the master plan for development projects with recipient countries, we can consider two types of impact evaluation based on randomized controlled trial. First, after considering different aspects, we can reduce the candidate for project villages to twice, and randomly select half of the candidate villages. As an alternative way, we can select project villages and randomly select half of the villages to receive the intervention and implement the intervention in the remaining villages after the end of the impact evaluation study. In this case, the project will be implemented in all of the recipient villages at a different timeline. One important point is that we should discuss with the recipient countries that we can implement a rigorous impact evaluation design without changing the master plan.

The Millennium Villages Project is a large-scale rural community development project implemented from 2005 to 2015 benefiting 500,000 people in 10 African countries with a budget over 200 billion won. The project aimed to achieve the Millennium Development Goals related to agriculture, education, health, hygiene, environment, and capacity building, and reached great progress in eradicating poverty and achieving the Millennium Development Goals (Sachs, 2018; Mitchell et al. 2018). When selecting the project villages in the beginning, the project failed to select control villages which was regarded as a

limitation in scientifically evaluating the project (Clemens and Demombynes, 2011). If the Millennium Village Project could have been scientifically tested based on a strict impact evaluation design, the project would have spread to other African and developing countries after the end of the project.

In case of the KOICA Myanmar rural community development project, we conducted a difference-in-difference method as we were not able to randomly select the control villages. Although it can be evaluated as an improvement of the Millennium Villages Project, it is still difficult to conduct a rigorous evaluation as the baseline characteristics between the treatment and control villages are not balanced. KOICA and the Myanmar government decided to implement the second five-year Rural Community Development Project from 2022. If we randomly select the project villages as well as the beneficiaries prior to the implementation of the project, we expect to have an advanced impact evaluation design compared to the first five-year project evaluation.

Implementation of Impact Evaluation

There was no discussion on the impact evaluation of the Myanmar rural community development project until 2015, and the rural community development project was spontaneously added. For this reason, the implementation of the baseline survey was postponed and there was a gap of 10-months between the baseline data collection of project villages and that of control villages. Apart from these research-related limitations, there were other difficult situations while implementing the impact evaluation. In this section, we critically evaluate the implementation of the impact evaluation, and provide recommendations for future impact evaluation projects.

For the Myanmar rural community development project, Korea Rural Community Corporation served as the implementing agency in the field (PC), and Korea Institute for Development Strategy managed the project (PM). The Korea Institute for Development Strategy covered personnel expenses and travel expenses related to the impact evaluation and helped the research team carry out the project. At the same time, data collection expenses were covered by the Korea Rural Community Corporation. As described above, the survey budget, which was reflected in the budget of the Korea Rural Community Corporation, only considered the survey cost for 100 project villages. The cost for the remaining 50 villages was supported by the KDI School of Public Policy and Management.

At that time, the KOICA managed the impact evaluation work for the Myanmar rural community development project by the Rural Development Team. As the Rural

Development Team disappeared after the restructuring of KOICA, the impact evaluation work was transferred to the newly established Department of Economic and Social Development. Subsequently, the impact evaluation work was finally transferred to Southeast Asia Team. The impact evaluation work was coordinated by the department in charge of the project, not the evaluation team of KOICA, and the KOICA office in Myanmar actively supported the Korea Rural Community Corporation, implementing agency in the field, and the impact evaluation field work. In other words, the implementing system of the impact evaluation research has been fragmented, and had to rely on the goodwill of PC, PM, KOICA headquarters, and KOICA local offices.

The impact evaluation research design is closely connected to the implementation method, and thus it is effective for the implementing agency (PC) to take charge of the impact evaluation project. At the same time, the independence of the impact evaluation study may be questioned when the implementing agency conducts the evaluation. Therefore, under the assumption that the PM is empowered to have a practical influence on the PC, it is advisable for the PM to manage the impact evaluation work. Similarly, in the case of the representative flagship project impact assessment promoted by KOICA, it is necessary to consider the impact assessment work in the KOICA evaluation office rather than the impact assessment work conducted by the department responsible for the actual business within KOICA. Similarly, in case of an impact evaluation of the flagship project by KOICA, it is recommended for the KOICA evaluation office, instead of the implementing office, to conduct the impact evaluation work. It is not necessary to conduct impact evaluation study for all of the projects by KOICA. Most of the projects can be evaluated using the process evaluation method or PDM.

In summary, for KOICA projects undergoing rigorous impact evaluation, the PM (not the implementing agency) should independently conduct the impact evaluation project. Also, the project should be managed by the evaluation office of the KOICA, while other KOICA offices and field offices support the project.

Feedback Method of Impact Evaluation

The feedback process, which enhances the efficient implementation of impact evaluation findings into policies, is the fundamental reason for conducting impact evaluation. (Sanderson, 2002; Parsons, 2002). However, one of the important issues to consider when establishing evidence-based policies is how to balance the rigor of impact evaluation and the timeliness of the feedback. The more rigorous impact evaluation results are pursued,

the longer it takes for the evaluation results to be derived. In particular, understanding the long-term effect of a specific project or program literally takes a long time. From the standpoint of enforcing programs and policies, policymakers are likely to prefer a real-time feedback.

In the case of the Myanmar rural community development project, the baseline survey was conducted in 2016 and the endline survey was completed in 2019. It took about 4 years to complete the baseline survey, midline survey, and endline survey, and in the process, a feedback process was not established to reflect the results of the impact evaluation. Due to the nature of the impact evaluation, the impact evaluation results can only be found after the completion of the endline survey. At the same time, we regret that we were not able to regularly share the summary statistics or pre-post analysis of the project with the implementing agencies.

In the future, when conducting a large-scale impact evaluation research on the KOICA flagship development project, it is necessary to approach the evaluation results in a systematic manner. It is also necessary to institutionalize from the beginning of the project how to provide timely feedbacks on the impact evaluation, which is conducted over a long period of time, while analyzing rigorous causal evidence through a randomized controlled trial method. Considering that the impact evaluation results can be derived after the end of the project, we can consider sharing the summary statistics, before and after analysis, and correlation analysis immediately after the baseline survey through meetings and seminars. At the same time, it will be desirable for the KOICA evaluation office to institutionalize the feedback process.

Conclusion

This impact evaluation report evaluates the Myanmar rural community development project implemented jointly by the Korea International Cooperation Agency (KOICA) and the Ministry of Agriculture, Livestock, and Irrigation (MOALI) over the past five years (2014-2019). The effectiveness of the project is analyzed by combining an experimental and quasi-experimental evaluation method. During the beginning of the project, it was not possible to set up a control group and perform a rigorous randomized controlled trial. As we set up the control villages ex-post to perform a strict impact evaluation, we conducted a difference-in-difference, which is a quasi-experimental evaluation method. Also, we randomly assigned sampled households into two groups in order to understand the effect of

differential incentive payment through inter-village competition, which is a key mechanism of the Korean rural community development project.

The results of the impact evaluation are as follows. First, we empirically tested if villages with higher social capital are likely to perform better in implementing the community-driven development project than other villages. We found that villages with higher level of social capital are more likely to be selected as A-ranked villages for the first two years, while villages with low level of trust are more likely to be selected as C-ranked villages for the first two years. However, this level of existing social capital cannot explain the pattern for the villages where performances were improved or downgraded. This finding implies that other factors such as the role played by local leaders, village development project governance, or implementation process of the project may be more important in explaining the changes in implementation success of village development projects.

In order to examine the impact of the Myanmar rural community development project, we also conducted a difference-in-difference analysis using the baseline, midline and endline surveys conducted in both the treatment and control villages. The project increased the level of social capital by 0.2 standard deviation and improved the level of trust towards local and central government officials as well as collective action among village members. There were also improvements in road and housing conditions as well as the availability of public goods including garbage collection services and public sewage systems. Regarding the income generation projects, there was a great increase in access to microfinance, and household income increased by 22-24%. In summary, the difference-in-difference approach shows that the project increased the level of social capital, living environment and household income.

Lastly, the behavioral experiment results show that inter-village competition, which is the key mechanism for the Korean rural community development project, does not have a statistically significant impact. Myanmar has consistently ranked at the top of the World Giving Index, which shows the strong giving culture in Myanmar. The initially high level of social capital in Myanmar suggests that there is limited room for impact of CDD projects on building social capital in the country. For this reason, we are planning to analyze the behavioral experiment results jointly for Myanmar and Cambodia as written in the Pre-Analysis Plan.

The Myanmar Rural Community Development Project has great significance in that it is the first large-scale impact evaluation research conducted by KOICA. A number of

problems were identified in the process of planning the impact evaluation, but together with KOICA, KOICA Myanmar Office, Korea Rural Community Corporation, Korea Development Strategy Institute, and KDI School of Public Policy and Management, we were able to successfully complete the five-year impact evaluation study. In the future, when conducting such a large-scale impact evaluation study, it is needed to improve the following points – (i) randomly selecting treatment and control villages prior to the start of the project; (ii) the governance system to efficiently conduct the impact evaluation study, and (iii) the feedback process that meets balance between rigorousness and timeliness. If we improve the afore-mentioned points, we expect that KOICA will play a leading role in aid effectiveness and evidence-based policy making among international donor agencies.

References

Angrist, Joshua, and Jorn-Steffen Pischke. 2010. “The Credibility Revolution in Empirical Economics: How Better Research Design is Taking the Con out of Econometrics,” *Journal of Economic Perspectives* 24(2): 3-30.

Cha, Seungman, et al. 2015. “The effect of improved water supply on diarrhea prevalence of children under five in the Volta region of Ghana: a cluster-randomized controlled trial.” *International journal of environmental research and public health* 12(10): 12127-12143.

Choi, E. Seul, and Booyuel Kim. 2016. "A Beginner's Guide to Randomized Evaluations in Development Economics." *Seoul Journal of Economics* 29(4): 529-552.

Clemens, M.A. and Demombynes, G., 2011. “When does rigorous impact evaluation make a difference? The case of the Millennium Villages,” *Journal of Development Effectiveness*, 3(3), pp.305-339.

Duflo, Esther, Rachel Glennerster, and Michael Kremer. 2007. “Using randomization in development economics research: A toolkit,” Handbook of development economics 4: 3895-3962.

Duflo, Esther, and Michael Kremer. 2005. “Use of randomization in the evaluation of development effectiveness,” Evaluating development effectiveness, 7: 205-231.

Gertler, Paul J., Sebastian Martinez, Patrick Premand, Laura B. Rawlings, and Christel MJ Vermeersch. Impact Evaluation in Practice. The World Bank, 2016.

Grootaert, C., Narayan, D., Jones, V. N., and Woolcock, M. 2004. “Measuring Social Capital: An Integrated Questionnaire.” World Bank working paper 18.

Grootaert, C., and Van Bastelaer, T. 2002. “Instruments of the Social Capital Assessment Tool.” In Understanding and Measuring Social Capital: A multidisciplinary tool for practitioners. Washington, D.C.: World Bank Publications.

Leamer, Edward. 1985. “Sensitivity Analyses Would Help,” *American Economic Review*, 75(3):308-313.

Mitchell S, Gelman A, Ross R, et al. 2018. “The Millennium Villages Project: a retrospective, observational, endline evaluation,” *Lancet Glob Health* 2018;6: e500 –13.

Parsons, Wayne. 2002. "From muddling through to muddling up-evidence based policy making and the modernisation of British Government." *Public Policy and Administration* 17.3: 43-60.

Rubin, Donald. 1974. “Estimating causal effects of treatments in randomized and nonrandomized studies,” *Journal of Educational Psychology*, 66(5): 688-701.

Sachs, Jeffrey D. 2018. “Lessons from the Millennium Villages Project: a personal perspective,” *Lancet Global Health* 2018;6: e472-e474.

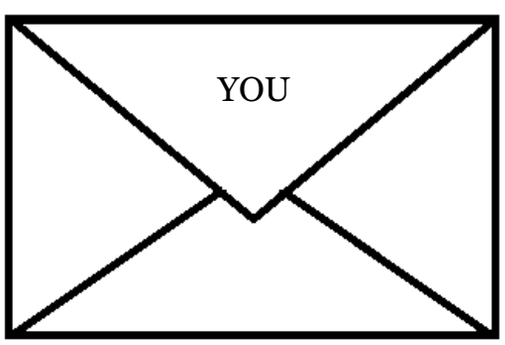
Sanderson, Ian. 2002. "Evaluation, policy learning and evidence‐based policy making." Public administration 80.1: 1-22.

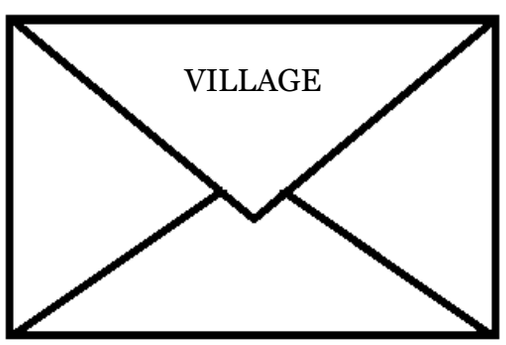
Appendix 1

Public Goods Experiment Instruction

We invite you to one brief exercise before the survey starts. This exercise involves real money reward.

We will give you two envelopes. One envelope printed with "YOU" contains 5000 Myanmar Kyat (25 bills of 200 Kyat), and the other one printed with "VILLAGE" is empty. You will be asked to make a donation out of the 5000 Kyat to your village. Your donation to the village will be used for your community - for example improving the road, public schools, or public hospitals. Note that your decision will be kept strictly private and confidential.





- "YOU" envelope
- Initially with 5000 Kyat
- This is for yourself

- "VILLAGE" envelope
- Initially empty
- This is for donation

Once you decide on the amount of money to donate to your village, please go to an isolated area and reallocate the amount from the "YOU" envelope to the "VILLAGE" envelope. Please remember that you can choose not to donate any amount to the village. The remaining amount in the "YOU" envelope becomes your money reward. After you keep the "YOU" envelope in a safe place, please bring back the "VILLAGE" envelope to the enumerator and enter the **"amount of your donation"** in the tablet. Please make sure the amount in the "VILLAGE" envelope matches the amount entered in the tablet.

The other survey participants of your village will make similar decisions. At the end of the survey, we will calculate the total amount of donation made by the

participants of your village.

In addition to the total amount of donation, your village will have an opportunity of earning extra money. 150 villages in Myanmar including your village will join a competition through the amount of donation. We will rank 150 villages in terms of the average amount of donation made by participants. If your village belongs to the group of the top 50 villages (ranked between 1st and 50th), your village will earn 100,000 Myanmar Kyat. If your village belongs to the group of the next 50 villages (ranked between 51st and 100th), your village will earn 50,000 Myanmar Kyat. If your village belongs to the group of the bottom 50 villages (ranked between 101st and 150th), your village will receive no extra bonus. If your village and other villages made same average amount of donation, we will randomly decide the ranking of your village and other villages. These extra money rewards will be added to the total village donation.

Two months after completing the survey, the village assembly meeting will be organized. At that time we will revisit your village and deliver your village chief the total amount of donation made by the participants of your village *plus* any extra money your village earns. Again, no one in your village will know how much you keep for yourself or donate for the village

Appendix 2

Instruction for Joint Investment Experiment

Thank you very much for your time to participate in this survey. As a token of appreciation, you are given 2,000 Kyat. Please, check whether you have 2,000 Kyat. This is your money and you can use it for your personal use. Please, put this envelope in your personal closet in your room and come back here to participate in the survey.

We invite you to one brief task before the survey starts. Each task involves real money reward.

In this task you will be given 2,000 Myanmar Kyat. You will be asked to decide how to use this money between two options. You can either keep this money for your personal use or invest this money to a joint project in which the other participants of your village can join. The total number of participants who make this decision in your group is 14.

If you decide to keep this money for your personal use, your earnings in this task is simply 2,000 Kyat.

If you decide to invest this money to a joint project, your earnings in this task will depend on whether a joint project succeeds or fails. If the project succeeds, you will earn two times of 2,000 Kyat (that is, 4,000 Kyat). If it fails, you will earn nothing (that is, 2,000 Kyat that you invested will be lost).

The chance of the project succeeding will depend on how many participants out of 14 participants invest their money to the project. Specifically, the chance of the project succeeding will be equal to the ratio of the number of investors to 25:

[Explanation of Probability Concept with Beans]

Please prepare 14 white beans, 25 black beans, and a plastic bag. Please explain first that the participant can think of the white beans as “participants in his/her village that invest their money,” and the total number of beans should equal to 25 in any case. If higher number of participants invest their money, winning probability increases. If there are

higher number of white beans in the bag, the probability of picking a white bean increases.

1. Put one white bean and 24 black beans in the bag (this case means that you are the only investor in your group and all of the others do not invest). Then, shuffle the beans without looking inside the bag. Ask a survey participant how likely it is to select the white bean out of 25 beans?

(1) Very unlikely
(2) Unlikely
(3) Equal chance
(4) Likely
(5) Very Likely

Answer should be (1) Very unlikely or (2) Unlikely

2. Put 5 white beans and 20 black beans in the bag (This case means that five participants including you in your group invest and nine other participants do not invest). Then, shuffle the beans without looking inside the bag. Ask the following question to the survey participant: “Compared to the previous case where we only have one white bean in the bag, do you think the probability of picking a white bean increased or decreased?”

(1) Increased
(2) Stay the same
(3) Decreased

Answer should be (1) Increased

3. Put 10 white beans and 15 black beans in the bag (This case means that ten participants including you in your group invest and four other participants do not invest). Then, shuffle the beans without looking inside the bag. Ask the following question to the survey participant: “Compared to the previous case where we have five white beans, do you think the probability of picking a white bean increased or decreased?”

(1) Increased
(2) Stay the same
(3) Decreased

Answer should be (1) Increased

4. Put 7 white beans and 18 black beans in the bag (This case means that seven participants including you in your group invest and seven other participants do not invest). Then, shuffle the beans without looking inside the bag. Ask the following question to the survey participant: “Compared to the previous case where we have 10 white beans, do you think the probability of picking a white bean increased or decreased?”

(1) Increased
(2) Stay the same
(3) Decreased
Answer should be (3) Decreased

5. Put 14 white beans and 11 black beans in the bag (This case means that all participants including you in your group invest). Then, shuffle the beans without looking inside the bag. Ask the following question to the survey participant: “Compared to the previous case where we have 7 white beans, do you think the probability of picking a white bean increased or decreased?”

(1) Increased
(2) Stay the same
(3) Decreased
Answer should be (1) Increased

If the participant incorrectly answered more than 3 out of 5 questions, please repeat 1-5 above. Please ask if the participant understands the probability concept. If yes, please explain the following point and practice with the respondent:

- If more participants decide to invest during the joint investment game, this case is similar to increasing the number of white beans in the bag.
- The respondent should randomly select a bean from a non-transparent plastic bag with one white bean and 24 black beans five times with replacement (This case means that you are the only investor in your group and all of the others do not invest. Also, your leader donates none). After the five-time practice, tell the participant that it is very unlikely to succeed the joint investment project in this case.
- The respondent should randomly select a bean from a non-transparent plastic bag with 14 white bean and 11 black beans five times with replacement (This

case means that all participants including you in your group invest). After the five-time practice, tell the participant that it is still possible that you lose your investment even if all 14 participants decide to invest.

In addition to your earnings, your village will have an opportunity of earning money. 150 villages in Myanmar including your village will join a competition through the amount of joint investment. We will rank 150 villages in terms of the total amount of joint investment made by 14 participants in each of the 150 villages. If your village belongs to the group of the top 50 villages (ranked between 1st and 50th), your village will earn 100,000 Myanmar Kyat. If your village belongs to the group of the next 50 villages (ranked between 51st and 100th), your village will earn 50,000 Myanmar Kyat. If your village belongs to the group of the bottom 50 villages (ranked between 101st and 150th), your village will receive no money. If your village and other villages made same average amount of joint investment, we will randomly decide the ranking of your village and other villages.

Therefore, before making your decision, you may need to think about how many participants would invest their money to a joint project. Note that your decision will be kept strictly private and confidential.

The other survey participants in your group will make the same kind of decisions. If the decisions of all participants are made, we will calculate the chance of the project succeeding. In case you invested, your earnings will be determined according to this chance.

Once you complete the survey, you are going to receive 1,000 Kyat as a token of appreciation. At the end of the survey in your village, we will revisit your house and deliver this amount of 1,000 Kyat and the amount of money you earned in case you invested and the project succeeded. Again, no one in your village will know about your decision.

Two months after completing the entire survey in 150 villages, we will revisit your village and deliver your SMU Chairman (in the treatment villages) or the village chief (in the control villages) the total amount of bonus money in case your village earned.