Final Draft

Nudging Escape from Poverty: Role of Mini Big-Push and Commitment Device in SWAPNO project

Report for the Study on "Conducting End-line Survey of SWAPNO 2nd Cycle"

Submitted to:

Strengthening Women's Ability for Productive New Opportunities (SWAPNO) Project

United Nations Development Programme (UNDP)

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Dedicated to Majeda Haq

Who dreamt about SWAPNO and was instrumental in advocating it for the millions of destitute abandoned women of rural Bangladesh

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List Acronyms and Abbreviations

AE	Adult Equivalent
BDT	Bangladeshi Taka
BIDS	Bangladesh Institute of Development Studies
BMI	Body Mass Index
DDS	Dietary Diversity Score
DID	Difference-in-Difference
FANTA	Food and Nutrition Technical Assistance Project
FAO	Food and Agriculture Organization
FDR	Fixed Deposit Return
FGD	Focused Group Discussions
HAZ	Height-for-Age Z-score
HDDS	Household Dietary Diversity Score
HFIAS	Household Food Insecurity Access Scale
HH	Household
HIES	Household Income and Expenditure Survey
IGA	Income Generating activity
KII	Key Informant Interviews
LGD	Local Government Division
LH	Life-History Interviews
MFS	Mobile Financial Services
OLS	Ordinary Least Squares
PC	Per Capita
PSM	Propensity Score Matching
RCT	Randomized Control Trial
REOPA	Rural Employment Opportunities for Public Assets
ROSCA	Rotating Savings and Credit Association
SD	Standard Deviations
SSC	Secondary School Certificate
SWAPNO	Strengthening Women's Ability for Productive New Opportunities
TV	Television
UNDP	United Nations Development Programme
UP	Union Parishad
VGD	Vulnerable Group Development
WAZ	Weight-for-Age Z-score
WHO	World Health Organization
WHZ	Weight-for-Height Z-score

Executive Summary

About SWAPNO

The study is about how small changes can induce large differences in the economic lives of the extreme poor. It highlights the need for a Mini Big-Push Transfer as well as conscious "nudging" to initiate a virtual cycle of savings, accumulation and growth. Drawing on behavioural economics, the nudge is more generally applied to influence behaviour and needs to be distinguished from the pure income-effects of transfer involved in the anti-poverty projects. In the present case, we argue that SWAPNO project is likely to have both transfer effects (influencing current consumption through wage income, and long-term investment through the compulsory savings) and nudging effects (through encouraging additional savings-investment activities via ROSCA and other group activities during the cycle of the project).

Strengthening Women's Ability for Productive New Opportunities (SWAPNO) is a transfer-based poverty graduation project aimed towards rural ultra-poor women who are divorced, widowed, abandoned or left with disabled husbands. The main objectives of this project are to give financial support to disadvantaged women through income transfer, savings building, livelihood training and employment generation. It is necessary to assess the effectiveness of such a project so that it can set some lessons for future models of anti-poverty interventions. The main big message of the study is that escaping extreme poverty over a short period is not only possible, but also desirable given the alternative scenario of largely spoon-feeding nature of the current social protection projects implemented over a longer period.

SWAPNO offers sizable benefits compared with many other conventional social protection projects. During the 18-months duration of SWAPNO project, beneficiaries get several kinds of benefits. They work from 8am to 2pm for 24 days per month and they have 150 BDT daily wage income. The actual per day wage is 200 BDT where 50 BDT is the compulsory savings which they can return after completion of the project. After completion of the project, beneficiaries get back the compulsory savings as an aggregate amount which is around 22,500 BDT. Altogether, each SWAPNO beneficiary has a transfer of BDT 87,300 over a cycle of 18 months. Along with the wage employment and compulsory savings schemes, SWAPNO project also enables their beneficiaries to participate in the rotating savings and credit association (ROSCA).

Objectives of the Study

The main objective of the present study is to assess the impact of the SWAPNO project on beneficiaries' wellbeing, including income, expenditure and asset accumulation through rigorous methods of project evaluation. The other likely effects of the project on employment, health status, nutrition, food security, education, aspiration (subjective well-being) and women's empowerment are also captured. We focus on the beneficiaries of the just completed 2017-19 cycle for measuring the effects of the project. The baseline study of SWAPNO 2nd cycle (2017-19) beneficiary was conducted in December 2017 on 1008 households, including 504 project and 504 control households. We conducted the end-line survey in August-September 2019 on the same set of households. Due to attrition, however, we finally got 437 beneficiary households and 374 control households. One innovative aspect of the evaluation is to include the current status of the former beneficiaries of SWAPNO project who graduated during the first cycle of 2015-17 in order to

assess the long-term resilience of the project beneficiaries. Thus, we carried out a new survey on 402 former beneficiaries who graduated from the project during the first cycle of 2015-17.

Methodology of the Study

We have 2 kinds of cohorts in both baseline and end line—the control group and treatment group, yielding four groups of households to work with- baseline control, baseline treatment, end line control, and end line treatment. Accordingly, the methodology of the proposed study has two *main* components: (a) comparing the change in the welfare status of the project beneficiaries over time with that of non-beneficiaries that were surveyed in the baseline by utilizing the framework of panel data and deploying the quasi-experimental methods such as the so-called difference-in-difference (DID) technique; (b) comparing the current welfare status of the project beneficiaries with that of the former beneficiaries within the set of "matched households" (to reduce selection bias) by deploying the so-called Propensity Score Methods (PSM). The latter is deployed because the baseline information is unavailable for the group of former beneficiaries.

Main Results of the Study

Five main conclusions emerge from our study. First, in respect of all major indicators of economic well-being, the SWAPNO beneficiaries graduating from the current cycle of 2017-19 outperformed the control group households. We focused on income per capita, consumption expenditure per capita and non-land assets per capita as three key economic indicators determining long-term income growth and economic well-being. This conclusion is upheld by all methods: simple OLS exploring the observed current differences in welfare, Propensity Score Matching (PSM) and the Difference-in-Difference (DID) methods.

According to the PSM method, current beneficiaries have an edge of BDT 3070 in respect of per capita income compared to their counterparts in the control group; the matched difference according to the DID method is even higher—BDT 3793. In short, current beneficiaries, on average, have *78% higher per capita income than the control group (as per PSM), and 96% higher per capita income than the control group (as per DID)*. The difference in respect of per capita consumption expenditure is understandably less (because of the heightened emphasis on savings in beneficiary households) but still considerable. The project participants have, on average, *have 58% higher per capita consumption expenditure than the control group (as per DID) and 55% higher per capita consumption expenditure than the control group (as per PSM)*. The most striking difference is observed in terms of capital accumulation. Both the PSM and DID methods indicate that the treatment group has more than 2 times higher non-land assets than that observed for the control group.

The project participants seem to be committed accumulators overcoming the psychological trap of procrastination and lack of self-control: only 20% of their non-land assets are represented by consumer durables; in contrast, 65% of their non-land assets are productive assets, and 15% are saved as financial assets for future use. These economic results are truly celebratory especially if we recall the difficult socio-economic contexts in which the project was implemented: these areas are generally marked by *weak markets* (as in Kurigram) and *weak institutions* (as in Satkhira and Kurigram).

Second, the above results were achieved *over a span of 18 months*. This gives an indication that the Mini Big-Push strategy can work: it can remove the heavy burden of extreme poverty within the shortest possible time. It may be mentioned that the value of the package involved in the Mini

Big-Push is higher than that observed for the conventional social protection projects, but not *considerably higher* when we take into account the *lifetime benefits* from such projects as the old-age or widow allowance. Is such mini Big-Push transfer defendable? Recall the total transfer/ investment per beneficiary over the 18-month cycle from SWAPNO is BDT 87,300. If the non-land asset accumulation over the 18-month cycle is BDT 11,541 per beneficiary and per capita income increase is BDT 3793 (as per the DID method), then the total monetary benefits turn out to be BDT 15,334. From this, one can estimate the "return to SWAPNO investment" to be in the order of 17.6% i.e. justifiable in economic terms. This is, of course, the lower bound value, as monetary benefits are calculated on *per capita basis* and transfer is calculated on *per beneficiary basis*. Correcting for this, we can see the return to SWAPNO investment could be as high as 43.6%.

Third, benefits from the SWAPNO project are not just noticeable in terms of major economic indicators but also reflected in terms of dietary diversity and "subjective measures" of well-being. Among the current beneficiary households, 64.5 percent have median or above bear dietary diversity, which is nearly twice more than the current control group (32.35%) indicating significantly higher dietary diversity for beneficiary households. Among the beneficiary households, 54% women attained median and above dietary diversity, while it is 43% for the control households. In terms of subjective food-poverty, only 7% of the project participants in the current cycle report food-deficit compared to 59% for the non-participants. They also tend to be more ambitious marked with higher aspiration for themselves (74% as against 38%) and for their children (68% vs. 51%).

Fourth, only a small fraction of both the beneficiary and control households have under-five children (109 children in total were originally listed in the baseline survey and 67 in the end-line survey). It will require a much bigger sample to generate representative estimates for child under-nutrition. For what it is worth, our survey shows a much lower prevalence of underweight children in the treatment group (37% as against 51%). The same trends emerge in case of child stunting rate.

Much complex picture emerges with respect to adult anthropometry. Although income measures, food intake, and dietary diversity have improved considerably in the group of current beneficiaries, BMI status for adult female members have not improved or improved little compared to their counterparts in the control group, at least during the tenure of the project cycle. This feeble difference may be due to hard physical labour given to public works on the part of project beneficiaries. The current beneficiary households are also suffering from the "double-burden of malnutrition": the BMI distribution for adult females has a bi-polar BMI distribution, having more "severely underweight" and "more overweight" at the same time. Consequently, the issue of adult anthropometry needs to be paid more attention in SWAPNO project, as no clear-cut advantage is discernible in current vs. control, or former vs. current beneficiary comparisons.

Fifth, the economic situation of the former beneficiaries has remained better compared to the control group households even after graduation from the project and this is reassuring about the positive benefits of SWAPNO project. However, there is a sign of visible slow-down in the economic fortunes of the former beneficiaries when they are compared to the current beneficiaries. The relative decline is recorded in all three economic measures—income, consumption spending, and non-land assets. This is also evident when other subjective measures of well-being are considered. Such setbacks are to be expected in escaping poverty. The important consideration is the ability to bounce back when the chips are down. It is possible that the former beneficiaries are actually able to recover from these setbacks. In that case, such slippages will be temporary. This

warrants paying greater focus on the *resilience* aspects when designing anti-poverty projects. This is an issue to which more attention needs to be paid on the part of SWAPNO project.

Policy Implications of the Study

Several policy implications are noteworthy.

First, there are issues of *project delivery* that needs to be re-visited. For instance, a recurring observation emerging from the FGDs is the factor of institutional delays on disbursing wage income—due to bureaucratic hassles—which often increase beneficiary indebtedness and even result in incurring higher costs of food and non-food household expenditure items. However, this issue merits greater examination. If the concern is true, then one way-out could be to arrange interim financing from the partner NGOs or any other third source of institutional finance to make wage funds readily available. A counter-argument is that partner NGOs may be constrained by financial resources. In view of this, it is important to ensure that all cash transfer commitments to the recipients must be institutionally available at the outset.

Second, there are issues relating to "second-chance" and more "intensive monitoring" that are required to make not-so-successful project participants viable over time. This may include more hand-holding of the less entrepreneurial sections of the poorest women by way of extra-doses of livelihood training, skill formation, job search and confidence-building measures.

Third, individual shocks seem to be an important driver of relative under-performance and decline over time, as emerging from the econometric results. Shocks seem to be an important explanatory factor for understanding economic outcomes--especially true in case of former beneficiaries as compared to the current beneficiaries. Some institutional mechanism for ensuring health insurance may need to be developed by the SWAPNO project to prevent fall into poverty.

Fourth, the SWAPNO project shows that, with injection of *threshold amount* of external resources, the persistent poverty trap syndrome can be overcome. This is in contrast to the tokenism that characterizes the conventional social protection projects. While this is a big success for the SWAPNO type of Mini Big-Push intervention, the issue of sustainability of the project impact has not been settled for good. The changing economic fortunes of the former beneficiaries is a case in point: they need to get some attention from the SWAPNO project to ensure long-term graduation from the poverty trap by enhancing their resilience capacity to bounce back when setbacks occur (they are bound to occur).

Fifth, one needs to ask as well about the *optimal use* of SWAPNO resources, i.e., whether the same project effects could have been generated with lower costs under alternative assistance packages. The current monthly transfer amount may be deemed too high (higher than the threshold amount) or just about right (closer to the threshold amount) depending on the argument. *This debate cannot be resolved without experimenting with varying assistance packages*, again in the spirit of randomized control trial (RCT), elements of which SWAPNO has been already practicing. In addition, what is need now could be tracer studies to capture long-term impact and resilience capacity in the face of inevitable shocks. This spirit can be explicitly factored in the project design in the upcoming pilots to be implemented in Jamalpur, Gaibandha, and Lalmonirhat. Such an experimental approach will be critical for much needed buy-in and also for deciding the future shape of the SWAPNO project.

Chapter 1: The S-Curve and the Mini Big-Push: Nudging Escape from Poverty

This paper is about how small changes can induce large differences in the economic lives of the extreme poor. It highlights the need for "nudging" to initiate a virtual cycle of savings, accumulation and growth.[1] Such "small changes" can be achieved through a variety of means. In case of SWAPNO—the project under the present review—it is achieved through the combination of *Mini Big-Push* transfers and *credible commitment* to savings.

Why is nudging warranted for escaping extreme poverty? This is because contrary to the assumption of "poor, but efficient" theory popularized by Schultz (1964), the very poor households remain engulfed with chronic poverty because their economic circumstances do not allow them to think like an "efficient economic agent" and behave like an "utility-maximizing rational individual" implied by the framework of *homo economicus*. The extreme poor often makes sub-optimal decisions and irrational choices that run contrary to their long-term best self-interests. As Duflo (2006) points it succinctly, the epithet of rationality cannot be used in relation to the extreme poor without much qualifications and hence the epithet with a question mark "Poor but Rational?" in her influential essay.[2] In this hopeless scenario only the better among the very poor have the chance—or the willingness--to move out of extreme poverty. The difference between the poorest and the better among the poor is small yet significant in explaining the divergent paths out of poverty. This is captured in the idea of poverty trap. The idea need not be conceptualized as income-trap alone; it can be food-trap, savings-trap, or aspiration-trap, or all of them acting together. However, the traps can be overcome by conditioning a mini Big-Push—providing the

[1] We are using the term "nudge" in the broad etymological sense of "coaxing or gently encouraging someone to do something". Drawing on behavioral economics, the nudge is more generally applied to influence behavior and needs to be distinguished from the pure income-effects of transfer involved in the anti-poverty programs. In the present case, we argue that SWAPNO project is likely to have both transfer effects (influencing current consumption through wage income and long-term investment through the compulsory savings) and nudging effects (through encouraging additional savings-investment activities via ROSCA and other group activities during the cycle of the project).

[2] The terms extreme poor, very poor and ultra-poor are used interchangeably in this paper. They commonly denote the most deprived section among the heterogeneous sub-groups of the marginalized population huddled together under the rubric of the poor. It may be mentioned that the absolute (or the "upper poor") is captured by *the upper poverty line* representing a nutritional requirement of 2,112 Kcal per person per day plus a minimum amount for non-food items. The extreme poverty line corresponding to a food intake of 1,805 Kcal per person per day denotes the extreme poor (or the "lower poor"). The monetized value of the extreme poverty line was BDT 1762 and 1811 per month per household member for Kurigram and Satkhira, respectively, in 2017. The upper poverty lines in 2017 in Kurigram and Satkhira were 1847 Taka and 2027 Taka per capita per month, respectively.

poor with *just enough* resources—to nudge them to embark on a better savings-aspiration-income path. This is what SWAPNO project seems to have attempted to accomplish over successive cycles. It is an experimental approach—with *randomized selection* of beneficiaries through the "lottery method" --with varying packages tried over time. There is much to be learnt from this experience both in terms of what works and what does not in case of escape from poverty.

Before outlining the main theoretical approach for this paper, it is important to introduce the SWAPNO project to the unfamiliar reader. After all, Bangladesh has witnessed a plethora of successful (and not-so-successful) projects that one additional pilot project even with a long history of existence can easily be missed out in the policy discourse. Such an amnesia would be most unwarranted as the SWAPNO genuinely provides a way-out of removing the most stubborn face of rural extreme poverty in the *shortest* possible time.

1.1 About SWAPNO

Strengthening Women's Ability for Productive New Opportunities (SWAPNO) is a social transfer-based poverty graduation project aimed towards rural ultra-poor women who are divorced, widowed, abandoned or left with disabled husbands. The main objectives of this project are to give financial support to disadvantaged women through savings building, livelihood training and employment. It also targets so that "economic growth is achieved in a more inclusive manner, with economic opportunities reaching rural poor women, and vulnerable groups are protected against shocks". Therefore, it is necessary to assess the effectiveness of such a project so that it can set some lessons for future models.

The project (SWAPNO) builds on UNDP's experience with the Rural Employment Opportunities for Public Assets (REOPA) project intervention, which was implemented by the Local Government Division (LGD) of MoLGRD&C from 2007 to 2011. Informed by the successes of the REOPA project, the SWAPNO project is designed as a follow-up programme in partnership with LGD, comprising public works type safety net employment of extreme poor women in the most vulnerable districts.

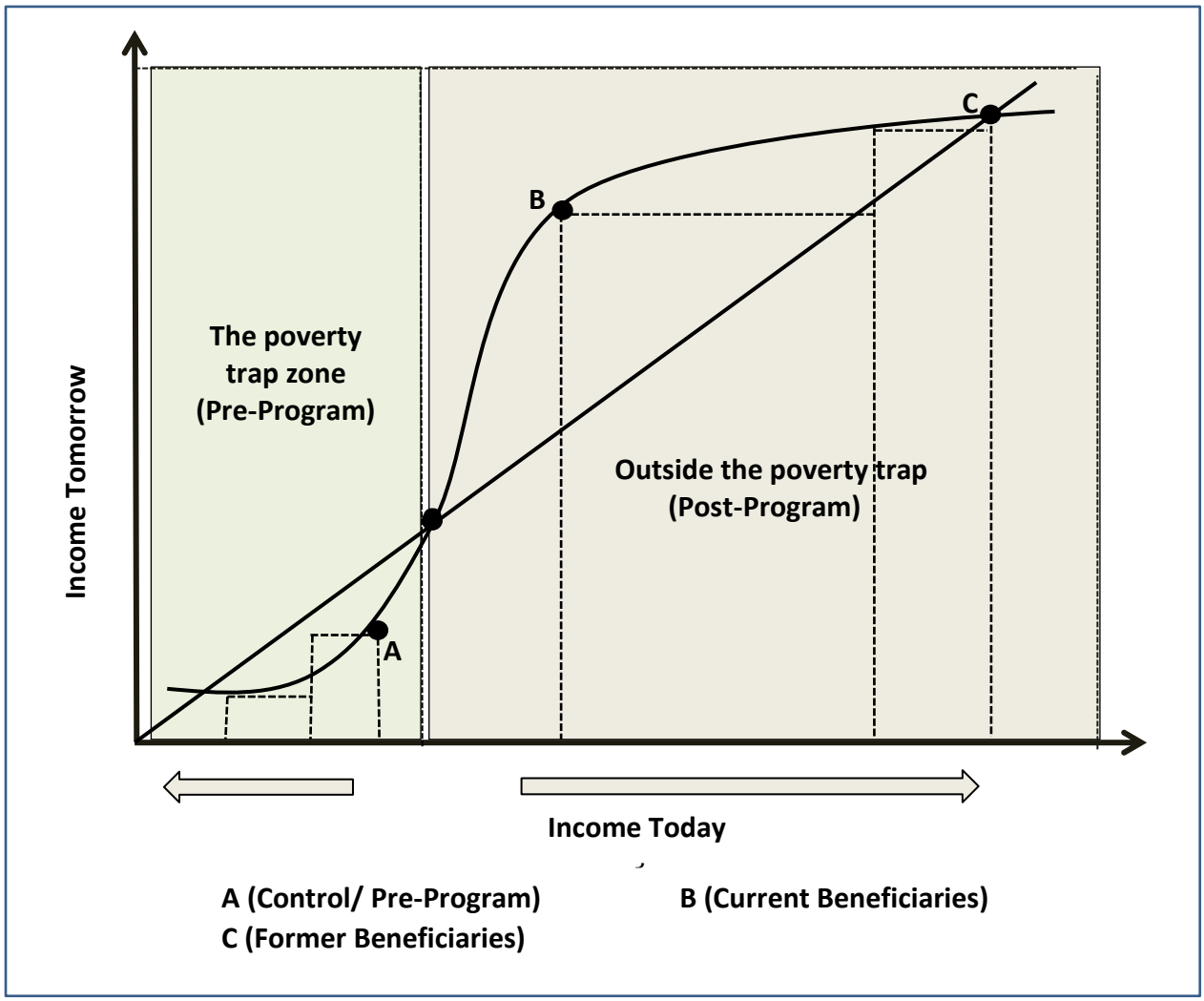
There is a baseline study on the SWAPNO 2nd Cycle beneficiary which was conducted in December 2017. The Randomized Control Trial (RCT) at the *beneficiary level* has been adopted to get a proper counterfactual which will eventually help do an impact evaluation of the project. There are 1008 households, including 504 intervention and 504 control households. The

beneficiaries of SWAPNO were employed under Union Parishad for public assets for 18 months. During this period, each beneficiary received about BDT 67,500 as cash wage and about BDT 22,500 as mandatory savings. Together, with employment, they received life skill and livelihood skill training under SWAPNO intervention. Besides, in order to promote savings habits and accumulate financial capital, beneficiaries participated in the Rotating Savings and Credit Association from the beginning of the project. SWAPNO's entry point is 18 months of cash-for-work employment in public works, simultaneously building human capital of extreme poor women. The employment tenure will be followed by a state-of-the-art 'graduation' strategy aimed at sustainable exit from extreme poverty, with a focus on future employability (skills, job placements, market linkages, access to services and social inclusion).

1.2 Poverty Trap and the S-Curve

The idea of poverty trap stipulates a world-view that the poor's *income today* is so little that it does not produce enough efforts to enhance *income tomorrow*.

Figure 1.1: The Poverty Trap and S-Shape curve



Source: Adopted from Banerjee and Duflo (2011) for SWAPNO Impact Evaluation.

Not only that, below certain threshold level of income or asset, the future income continues to decrease, thus making ascent from poverty even more difficult with the passage of time. Only when the poor's income exceeds a "threshold level" things begin to change dramatically. This is famously shown by the generic S-Curve used by Banerjee and Duflo (2011).

Change in the welfare situation of the SWAPNO beneficiaries can be graphically represented as an "S-shaped" curve. Before joining the SWAPNO project, they were living on the left side of the graph below the diagonal line (**Point A** in the curve): in this zone, future income is lower than present income, and it continues to decrease over time. This is because their savings is so meagre, they might not want to save it at all and would rather consume it, thereby reducing prospects of future income even further. As a result, one calls it the zone of poverty trap. This is arguably the situation of the control members surveyed for the present paper. The control members are those who did not participate in the project, but in theory could have participated in it but for the outcomes of lottery used in the beneficiary selection process. Note that at the point of intersection of the S-curve with the diagonal 'income today' equals 'future income' (**Point O** in the curve). When the SWAPNO intervention was made—with a package of *mini Big-Push* and a nudge in the form of *commitment device* to savings—the situation started to change dramatically. Those who were previously below the 45-degree line started to move above the 45-degree line wherein future income is higher than the present income, thus escaping the poverty trap situation (**Point B** in the curve). As the income of the SWAPNO beneficiaries grew, the diminishing marginal returns to factors of production set in, as a result income growth declines (**Point C** in the curve). This may resemble the case with the former beneficiaries of the SWAPNO project in absence of additional instruments of SWAPNO intervention.[3]

[3] It may be noted that the SWAPNO project is geared towards the current cycle of beneficiaries: once they graduate there is no formal mechanism of interaction between the SWAPNO projects and the economic lives of the former beneficiaries. This may reduce the sustainability of the project impact beyond the tenure of the project. We shall take up this issue later.

Although the curve adopted below is shown for present/ future income for the SWAPNO beneficiaries, it is equally applicable for understanding the *other causes* of poverty traps. For instance, if today's savings is too low, it will not have desired effects on tomorrow's savings. In fact, it may have a reverse effect. Faced with a meagre savings scenario, the extreme poor may not opt for saving at all and decide to consume the entire amount. After all, which conventional savings institution will be willing take the miniscule savings of an extreme poor person? In short, the poverty trap has many faces, including savings, asset, nutrition and aspiration related traps that are equally potent and equally ubiquitous in the economic lives of the extreme poor. The question that springs up is: how to take the extreme poor from point A to point B on the S-Curve? This is where the idea of mini Big-Push becomes relevant.

1.3 The Idea of Mini Big-Push

The idea of big push originated in the foreign aid literature. Because of initial low national income developing countries typically had low domestic savings and investment ratios, thus creating a vicious cycle of low income-low savings-low growth-low income. International aid helps to break this pernicious cycle in two ways: first, it augments domestic savings by placing at the disposal of recipient countries an additional amount of foreign savings; second, since foreign savings come not just as savings but typically in the form of foreign currency it can be used to finance import needs of the recipient country without deteriorating the country's current account deficit. Thus, aid is often seen to have beneficial effects on the "twin deficits" of a recipient country—budget deficit and current account deficit. Something similar may happen to anti-poverty transfers at the households as well. Beneficiaries of social protection projects are typically income-deficit households: they have low income as a result they can save little from their income. Additional transfers may augment their household savings, provided the transfer amount is adequate to supplement the household's efforts to reach the "threshold amount" of household savings (to move above the diagonal line described in the figure 1). Such transfers often come in the form of acquisition of technology, marketable skills, and know-how to do business in quick-return activities--typically in *tradable* goods--that are more income-augmenting and debt reducing. The problem is that often the transfers received by the beneficiaries are too little too late and unable to make any dent on poverty. In the parlance of S-Curve, such token transfers fail to move the extreme poor from Point A to Point B. Token transfer matters little for raising the savings or the income

level of the extreme poor. As a result, they are likely to be used for current consumption purposes, causing "adverse nudging" from the long-run welfare point of view.

Figure 1.2 presents average allocation per project beneficiary across major social protection and human development projects, including the SWAPNO project. As such, some of these projects and SWAPNO may not be very far from each other. After all, if we take the "time" dimension into consideration, the aggregate transfer through the old-age or widow allowance over the lifetime would be considerable (BDT 72,000 for the old-age allowance as against 87,300 for SWAPNO).[4] However, many of them are operated for a protracted period of time with disbursement in tiny monthly installments. As a result, most of the existing social protection projects (except for VGD) stipulate *very modest monthly benefits per beneficiary* that do not exceed 1-2 days of agricultural wage labour.

In view of this modest allocation it should come hardly as a surprise that the existing social protection projects have very limited poverty effects.[5] Even the more generous VGD project is outweighed by a huge margin by the SWAPNO project (an annual transfer of BDT 10800 vs 58200).

Is the amount allocated for SWAPNO justified compared to the meagre amount allocated for other public social protection projects? If so, then what counts? Our research question is whether a considerable injection of resources—of the scale implicitly envisaged in the old-age or widow allowance scheme *but disbursed over a short period*--can eradicate extreme poverty. This is the question we try to grapple with in this paper. Given the sizable amount of transfer per beneficiary under the SWAPNO project—estimated to be BDT 4850 per month per beneficiary—we expect a major reduction of consumption-poverty. In other words, a dramatic uplift from Point A to Point B in the S-Curve is expected. As a result, the SWAPNO households are expected to be trap-free zone of the S-Curve and display improvements on multidimensional measures on almost all counts compared to their unfortunate comparators who dropped out in the process of lottery. A mini Big-Push transfer would lead to a real Big-Push in poverty eradication: nothing short of that feat will

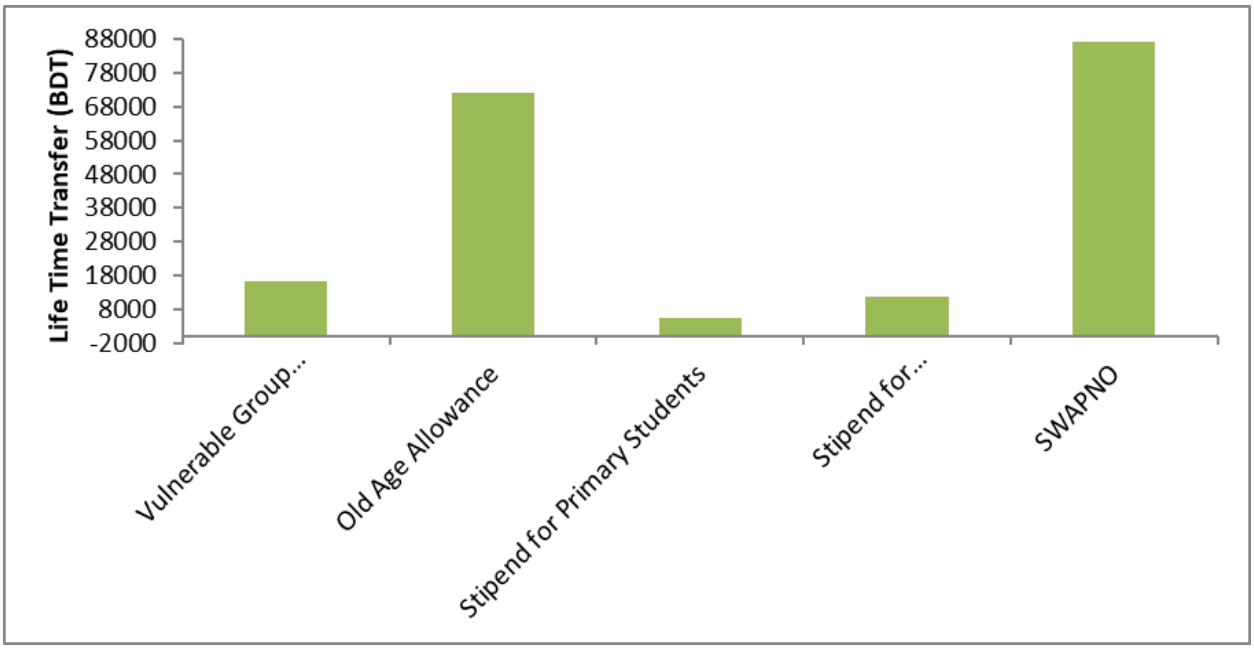
[4] We assume that an old-age beneficiary gets the allowance over a 12-year period, starting from 60 years of age with an average longevity of 72 years.

[5] According to one such recent simulation exercise based on HIES 2016, the aggregate consumption-poverty headcount declines by a margin of 1-2 percentage points between the pre and post-transfer situations.

justify this amount of experimental transfer compared to official tokenism in social protection projects. This is our first null hypothesis.

However, we were surprised by another aspect of the project. We initially thought that the one-time transfer by way of forced savings at the end of SWAPNO 18-month Cycle would explain the bulk of the movement of out of extreme poverty. After all, getting access to an accumulated savings amount of BDT 22,500 would surely make a large difference to the economic lives of the extreme poor who normally could not dream of having such resources at their disposal in the pre-project period. In the eyes of the beneficiaries, however, it is not the "forced savings" amount that counted or rated most. They tended to value more the virtue of another project instrument introduced in the 2015-17 cycle. This relates to the role of a saving method—popularly known as "group lottery" and generically termed as ROSCA—in their battle against poverty.

Figure 1.2: Annual Transfer per Beneficiary across Social Safety Net Projects



1.4 Commitment Device for Fostering Savings

Another important intervention that merits equal attention is SWAPNO's efforts to address the "self-control" problems of the very poor. As Mullainathan (2006) has pointed out, not all choices are active conscious choices: some choices are made in a passive manner--essentially due lack of self-control. Despite facing food deficit, the poor may spend some of the scarce resources in in the passive manner such as on gambling, consuming tobacco, festivities or other distractions. Integration of the insights of psychology with economics can lead to many new directions of polices. The emphasis on fostering credible commitment device for savings is a case in point.

As mentioned earlier, the saving behaviour of the extreme poor also displays the pattern of the S-Curve. Under the condition of poverty trap, the poor save so little from their meagre income that they often do not attach adequate importance to savings. Since one-time transfer by way of forced savings from their daily wage income is receivable only at the end of the SWAPNO cycle it cannot act as an incentive to save during the cycle. In fact, the prospects of getting sizable lump-sum transfer at the end of cycle may even discourage savings during the cycle. In order to prevent that happening, there is a need for developing a credible commitment device to encourage savings during the cycle. One of the innovations of the SWAPNO project was to *inculcate the saving habit*

among the beneficiaries through the introduction of the model of Rotating Savings and Credit Association (ROSCA). In collaboration with the local government, SWAPNO organizers select 36 members for each union who are further sub-divided into 3 groups, each consisting of 12 members. This team of 12 members constitute the ROSCA group.[6] The advantage of ROSCA is that it offers a "commitment device": the pressure to put money aside regularly help them to save, which might have been difficult for many of them given the lack of self-control in the face of many competing spending demands. Mullainathan (2006) cites some ROSCA participants saying that "you can't save alone". Although ROSCA do not offer interest on deposit, it has triple benefits as the ROSCA experience in SWAPNO project suggest. First, it may allow to save considerable amount while still in the project and thus enable the SWAPNO members to initiate income-generating activities at an early stage of the cycle. Second, it may cement the social bonding among the SWAPNO members, which may prove to be a useful platform in times of shocks. As a result, many of the SWAPNO groups have continued even after the termination of the cycle. Third, it may encourage more saving habit at the individual level—including an awareness of the virtues of financial savings whether in formal banks or quasi-formal MFIs at the local level--even after graduating from the project. All this are likely to be beneficial for the long-term economic mobility of the SWAPNO members.

The other important issue is the role of skill training and "learning-by-doing". Without imparting skills to the beneficiaries, it is very difficult to ensure proper utilization of any kinds of savings whether it is in the form of one-time grant by way of forced savings or in the form of voluntary savings by way of ROSCA. While qualitative evidence for SWAPNO is suggestive of critical importance of skill formation as a factor inducing successful business ventures, our evaluation design was not adequately set up to explore this is issue satisfactorily in a quantitative manner. Simple cross-sectional differences between those who received training and those who didn't, are not revealing enough to elucidate the intrinsic worth of livelihood training and estimate the "returns to training". More in-depth study is needed in this regard.

[6] In a ROSCA group, members meet at regular intervals and at each meeting, they contribute a pre-determined amount. The sum of these funds (the "pot") is then given to one group member often on a lottery basis. Each member gets her turn eventually.

1.5 Objectives and Methodology of the Study

The *main objective of the study* is to assess the **impact of the SWAPNO project** on beneficiaries' well-being, including income, expenditure and asset accumulation through rigorous methods of project evaluation. The other likely effects of the project on employment, health status, nutrition, food security, education, and aspiration (subjective well-being) are also indicated by comparing the treatment and control groups.

The methodology of the proposed study rests on three components: (a) comparing the *change* in the welfare status of the project beneficiaries over time with that of non-beneficiaries that were surveyed in the baseline by utilizing the framework of panel data and deploying the quasi-experimental methods such as the so-called difference-in-difference (DID) technique used in standard impact evaluations (see, Gertler et al 2016); (b) comparing the *current* welfare status of the project beneficiaries with that of non-beneficiaries within the set of "matched households" (to reduce selection bias) by deploying the so-called Propensity Score Methods (PSM) (see, Bai and Clark 2018). This method is deployed in this study as an *additional check* on the project impact, as panel analysis based on baseline and end-line surveys conducted by two different agencies (which is the case here) may be susceptible to non-sampling *measurement errors*; and (c) comparing the *current* welfare status of the project beneficiaries with that of *former beneficiaries* (graduates of the previous cycle of SWAPNO) with a view to assessing the *sustainability* of the project intervention (Ravallion 2001).

The baseline study of SWAPNO 2nd cycle (2017-19) beneficiary was conducted in December 2017 on 1008 households, including 504 project and 504 control households. We conducted the end-line survey in August-September 2019 on the same set of households. Due to attrition, however, we finally got 437 beneficiary households and 374 control households. In addition, we carried out a new survey on 402 former beneficiaries who graduated from the project during the first cycle of 2015-17. We have 2 kinds of cohorts in both baseline and end line—the control group and treatment group, yielding four groups of households to work with- baseline control, baseline treatment, end line control, and end line treatment. Therefore, the difference-in-difference (DID) method can be used to find the changes from baseline to end line of the project.

The proposed econometric model that will be mainly considered is as follows:

$$Outcome\ i,t = \beta_0 + \beta_1\, after + \beta_2 SWAPNO + \beta_3(SWAPNO * after) + e_{i,t}$$

Where the dependent variable $Outcome$ is income, asset, health, education, etc. of household i at time t which could denote either baseline or end-line round. The variable 'after' is a dummy variable, which takes on 1 if the data comes from end-line, and zero otherwise. 'SWAPNO' is also a dummy variable which assumes 1 if the household is a participant of SWAPNO and zero otherwise. The interaction term $(SWAPNO * after)$ captures the treatment effect or the difference-in-difference estimates.

It may be noted that both control and project beneficiaries were initially on the same 'lottery list' with equal probability of being selected for the project. In the case of *randomized control trials* (RCTs) it is ensured that the selection of beneficiaries and control group comparators are random. It is equally vital that they share the same pre-project markers. Both *randomness in selection* and *sharing the common exogenous characteristics* are important assumptions behind conducting either PSM or DID. In case of SWAPNO, both these qualities were maintained right at the outset of project intervention. This kind of survey design provides the ideal setting for making welfare comparisons between the treatment and control groups:

The study has also administered some qualitative tools, like Life-History Interviews (LH), Focused Group Discussions (FGD) and Key Informant Interviews (KII), for a deeper understanding how an intervention like SWAPNO can reduce poverty among the disadvantage groups. During the FGD with the beneficiaries of the SWAPNO, we tried to capture the efficiency and effectiveness of the employment generation with mandatory savings scheme for poverty reductions, benefits from ROSCA, and the scope for improvement for future interventions etc. In addition to the beneficiaries' feedbacks, we tried to gather the impressions of the local representatives, for example, UP Chairman and Member, of the project comparing with other poverty reduction project run by different ministries. The important of the latter cannot be discounted. For example, when a UPO Chairman in Kurigram told us they need "more such SWAPNO projects" in that area because only a small part of prospective beneficiaries could be accommodated—after all, "only 36 members were selected when the names in the 'lottery list' was as high as 300"—we come to the conclusion that the project is relevant and needs serious examination.

To sum up, our main methodological approach has been to try different methods—(a) explore cross-sectional variation in outcome indicators in the current cycle by using OLS, (b) use the PSM method to conduct comparisons "between likes with likes" based on *observable* exogenous

characteristics; and (c) use the DID method to assess the project effects on outcome indicators controlling for observable exogenous characteristics as well as time-invariant unobservable characteristics. If all three methods yield similar results--and they broadly correspond to our impressions culled from qualitative instruments mentioned above--then we can come to a reasonable conclusion regarding the project effects.

1.6 Structure of the Paper

The paper is divided into six sections. The first introductory section describes the analytical and methodological approach to the study. Project inputs are described in Section 2. The third section conducts welfare comparisons between the current beneficiaries and the control group members. The fourth section presents the main quantitative results on the effects of project on the current beneficiaries compared with the control group members obtained by using PSM and DID methods. Sustainability of the project effects is discussed in the fifth section with similar quantitative techniques applied in relation to former beneficiaries (those who graduated in the 2015-17 Cycle) and the current cycle. Conclusions and the policy implications have been captured in the sixth section.

Chapter 2: Description of Project Inputs

2.1 Monetary Transfer from SWAPNO

During the 18-month duration of SWAPNO project, beneficiaries[7] get several kinds of benefits. They work from 8am to 2pm for 24 days each month, implying that they can use the remaining hours of the working day for some income-earning activities. The work they do is usually for the maintenance of the public and community assets for which they earn a daily wage income of BDT 150, which provides a secure food-nutritional platform for the extreme poor struggling to meet the both ends. The actual daily wage is, however, higher: it is BDT 200 where there is a component of BDT 50, known as the "compulsory savings", which they can access (with normal interest) only after the completion of the project. This compulsory savings component turns out to be BDT 22,500 (in current prices) at the end of 18-month cycle. If we annualize this compulsory savings amount it translates into BDT 15,000. This is equivalent to 9% of total annual household income and 24% of total annual expenditure reported by the SWAPNO beneficiaries during our survey.[8] Considering the daily wage and compulsory savings components, the average yearly transfer received by a SWAPNO beneficiary amounts to BDT 58,200 (Box-1). This, however, does not consider the return to investments made from the lump-sum monetary benefits from participating in the ROSCA that the SWAPNO members engage in during the tenure of their membership,[9]

During the 18-months duration of SWAPNO project, beneficiaries get several kinds of benefits. They work from 8am to 2pm for 24 days per month and they have 150 BDT daily wage income. The actual per day wage is 200 BDT where 50 BDT is the compulsory savings which they can return after completion of the project. After completion of the project, beneficiaries get back the compulsory savings as an aggregate amount which is around 22,500 BDT. All the SWAPNO beneficiaries have yearly project income around 58,200 BDT (Box 1) Along with the wage

[7] Unless otherwise mentioned, the term SWAPNO beneficiary denotes the category of "current beneficiary" who have just passed out of the 2017-19 Cycle in contrast to "former beneficiary" who passed out of the 2015-17 Cycle.
[8] Note that, as per the present survey, the average total household income and consumption expenditure of a SWAPNO beneficiary is estimated to be BDT 16240 and BDT 5785, respectively.
[9] ROSCA is a group of individuals who come together to make regular contributions to a common fund, which is then given as a lump sum to one of the group members by lottery, until all members have received the lump sum in rotation. By way of ROSCA, the individual savings-investment behavior of the participants can be encouraged, having a nudging effect.

employment, SWAPNO project also enables their beneficiaries to rotating savings and credit association (ROSCA).

Beneficiaries form a group 10-12 people according to the number of beneficiaries in the same ward in a union. Each member must pay 300 BDT and the draw winner gets 3000-3600 BDT. Each member has received the winning money from ROSCA 3-4 times during the whole project depending on the frequency of the draw happens. So, each beneficiary received 3000-3600 BDT of small amounts 3-4 times in the project duration, which helped them to invest in small income generating activities.

Box 1: SWAPNO Project Transfer

- During the whole period of SWAPNO project, beneficiaries get two kinds of income: (1) regular wage income, (2) compulsory savings
- They get another income from ROSCA- which is actually paid from their own regular income
- Regular monthly income: 150*24= 3600 BDT
- Regular income from the SWAPNO project (18 months): 3600*18=64,800 BDT
- Yearly regular income from SWAPNO project: 3600*12=43,200 BDT
- Compulsory savings income after completion of the SWAPNO project: 22,500 BDT
- Yearly compulsory savings income: 15000 BDT
- Total income from SWAPNO project (in a 18 month-cycle): 22,500+64,800= 87,300 BDT
- Total apportioned yearly income from SWAPNO project: 58,200 BDT

2.2 Sectoral Breakdown of SWAPNO Income

SWAPNO beneficiaries have three SWAPNO related income as discussed before; regular income, compulsory savings and ROSCA income. So, it might be interesting to see how they make their budgets depending on the sources of SWAPNO income.

Table 2.1: Proportion of Households Using SWAPNO Transfer on Particular Items

	Regular income	Compulsory savings
Food products	86.73%	11.90%
Treatment	35.70%	4.58%
Children's Education	25.17%	3.43%
Savings: ROSCA	23.34%	0.92%
Savings: Other Source	29.98%	28.38%
Loan payment	6.18%	2.06%
Land lease	15.10%	24.03%
Free up leased land	0.46%	0.00%
Buying land	2.52%	1.83%
Agricultural tools	0.00%	0.23%
Fishing	3.20%	1.37%
Animal rearing	27.46%	22.20%
Business capital	16.48%	8.70%
Rickshaw / van / boat	0.69%	0.23%
TV / refrigerator	1.60%	0.00%
Children's marriage	1.37%	1.37%
House Repair	21.97%	5.26%
Jewellery	3.20%	0.92%
Mobile phone	6.41%	0.23%
Bicycle	1.37%	0.23%
FDR	2.06%	5.03%
Dowry	0.46%	0.69%
Others	11.67%	8.70%

Table 2.1 shows the proportion of current beneficiary households spending SWAPNO regular income and compulsory savings on some sectors. Highest proportion of current beneficiaries have reported that they spent their regular income on food items (87%), which is followed by medical treatment (36%) non-ROSCA savings (30%), animal rearing (27%) etc. However, the highest proportion of current beneficiary households spent their compulsory savings on non-ROSCA savings (28%), followed by land lease (24%), animal rearing (22%) etc. It is clear from the table that, since they were poverty-stricken, they put most of their regular income on purchasing foods.

However, when it comes to savings income, they invest their savings on income generating economic activities.

Table 2.2 Proportion of Households Using ROSCA and Compulsory Savings Income on Particular Items

Sector	Current beneficiary		Former beneficiary	
	ROSCA	Compulsory savings	ROSCA	Compulsory savings
Food products	40.96%	11.90%	38.81%	15.92%
Treatment	12.36%	4.58%	12.19%	9.45%
Children's Education	10.76%	3.43%	8.96%	5.22%
Savings: ROSCA	5.26%	0.92%	4.23%	3.23%
Savings: Other Source	14.42%	28.38%	7.46%	12.19%
Loan payment	2.29%	2.06%	3.98%	2.74%
Land lease	5.72%	24.03%	3.73%	16.92%
Free up leased land	0.23%	0.00%	0.00%	0.50%
Buying land	0.92%	1.83%	1.99%	5.72%
Purchase of agricultural tools	0.69%	0.23%	0.00%	0.00%
Fishing	4.58%	1.37%	4.48%	3.48%
Animal rearing	37.53%	22.20%	40.55%	25.12%
Business capital	21.74%	8.70%	18.41%	12.94%
Rickshaw / van / boat	0.23%	0.23%	0.50%	0.25%
TV / refrigerator	0%	0.00%	0%	0.25%
Children's marriage	1.14%	1.37%	1.49%	2.24%
House Repair / Development	7.78%	5.26%	8.96%	10.45%
Jewellery	1.14%	0.92%	1.00%	0.50%
Mobile phone	0.46%	0.23%	0.25%	0.25%
Bicycle	0.00%	0.23%	0.25%	0.50%
FDR	3.20%	5.03%	1.24%	3.48%
Dowry	0.69%	0.69%	0.50%	1.00%
Others	16.93%	8.70%	17.16%	9.70%

Table 2.2 shows the proportion of current and former beneficiary households spending their ROSCA and compulsory savings income on some sectors. Highest proportion of current beneficiaries have reported that they spent their ROSCA income on food items (41%), which is followed by animal rearing (38%), business capital (22%), medical treatment (13%) etc. Accordingly, the highest proportion of former beneficiary households spent their ROSCA income on animal rearing (41%), followed by food item (39%), business capital (18%), health treatment (12%) etc. Most of the SWAPNO beneficiaries- both current and former- have utilized their ROSCA income spending on income earning activities. Highest percentage of former beneficiaries have reported that they spent their compulsory savings on animal rearing (25%), followed by land lease (17%), food item (16%) and business capital (13%). Most of the SWAPNO beneficiaries- both current and former- have utilized their money spending on income earning activities. In that case, compulsory savings income has greater contribution to income generating activities than the ROSCA. However, some proportion have spent on house development, buying mobile phone, jewellery, bicycle etc.

2.3 Training on IGAs and social awareness

Along with wage employment and ROSCA SWAPNO project facilitates their beneficiaries some training on income generating activities (IGAs) and social awareness. These trainings help them to gain skill on their income, livelihood, and change their outlook.

Table 2.3 Proportion of household having training on IGA

Having at least on training on IGA	Current beneficiary	Current control	Former beneficiary	Total
Yes	434	5	177	616
	99.31	1.34	44.03	50.78
No	3	369	225	597
	0.69	98.66	55.97	49.22
Total	437	374	402	1213
	100.00	100.00	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 2.4: Proportion of households having IGA training

Type of training	Current beneficiary	Former beneficiary
Animal Farming	75.29%	34.33%
Poultry	55.61%	27.86%
Handicraft	6.41%	0.75%
Business	53.32%	11.69%
Fisheries	11.67%	2.74%
Sewing	10.76%	4.73%
Money Management	12.36%	7.71%
Others	2.52%	1.99%

The proportion of the households having at least one training on IGA and the type of training they have are shown in the Table 2.3 and Table 2.4. Current beneficiaries have way more high training on IGA then the former beneficiaries. Almost 100 percent of the current beneficiary have training, while it is less than half (44%) for the former beneficiaries. Part of the reasons is that former beneficiaries tend to forget about the training they may have received comparatively earlier than the current beneficiaries—a result of under-reporting the end-line survey. Nevertheless, the difference is striking and would suggest that the training component was less well-emphasized in the first cycle compared to the second cycle. According to the type of training, the proportion is highest in animal farming (75% and 34%) both for current and former beneficiaries followed by poultry, business, money management, fisheries, sewing etc.

Table 2.5: Proportion of households having training on child health, education and child marriage

	Current beneficiary	Current control	Former beneficiary
Yes	98.17%	1.07%	43.53%
No	1.83%	98.93%	56.47%

SWAPNO beneficiaries have training on social awareness like child health, education, child marriage etc. Table 2.5 shows the proportion of household having at least one training on any of the child health or education or child marriage. It is seen that almost all (98%) of the current beneficiary have had at least one training that is related to social mindfulness. Accordingly, almost half of the former beneficiary has had training on those issues. Interestingly and sadly, only 1% of the control group household had these types of training.

Box 2: SWAPNO project Limitations and Recommendations[10]

- SWAPNO project limitations:
  - There is a huge number of very poor widowed/separated/divorcee women but small number of beneficiaries in each ward
  - Beneficiaries think that duration of the SWAPNO project is short and it could be longer
  - Allowances provided by SWAPNO for IGA or other training are not good enough
  - Training is provided by lower skilled persons
  - Less or non-existent monitoring from SWAPNO officers after completion of the project cycle
  - Institutional delays on disbursing wage income often increase indebtedness and even result in incurring higher costs of food and non-food household expenditure items
- Recommendations for the future:
  - To increase number of beneficiaries in each ward
  - To increase daily compulsory savings amount
  - To increase time span of the project cycle
  - To keep follow-up monitoring after completion of the project cycle
  - To give "second-chance" to the not-so-successful cases
  - To provide wage on regular basis even if by borrowing funds from another source
  - To increase the amount of daily wage

[10] Evidence from FGDs, KIIs and Life History Interviews. The summary points from the FGDs, KIIs and Life History Interviews—as captured above--are only highlighted when they are reported by the majority of respondents participating in the qualitative surveys. The full text of these discussions are available in Bengali as a separate document (not enclosed herewith).

Chapter 3: Well-Being Comparisons between Current Beneficiary and Control Groups

In that chapter, we are going to compare economic, social and nutritional indicators between current beneficiary households of the SWAPNO second cycle and current control households of the SWAPNO second cycle. These comparisons will help to identify the effectiveness of the project to improve economic and social conditions of the beneficiary households.

3.1 Income, expenditure and asset

Three most important indicators to judge the economic stability of any household are income, expenditure and asset. In that section we would like to compare per capita household income, per capita household expenditure and per capita household non-land asset across current beneficiary and control households.

Table 3.1: Expenditure among SWAPNO Second Cycle Households

		Food expenditure	Non-food expenditure	Total Expenditure	Expenditure per capita
Current beneficiary	Mean	3035.5	2749.9	5785.4	2719.1
	SD	1610.1	3205.7	3756.3	2653.9
Current Control	Mean	2559.8	1805.3	4365.1	1699.2
	SD	1241.2	1688.8	2384.0	928.3
All	Mean	2816.1	2314.3	5130.4	2248.7
	SD	1470.1	2658.4	3273.2	2108.7

Table 3.1 delineates the mean values and standard deviations (SD) of household expenditure across current beneficiary and current control groups. Overall, household expenditure of current beneficiary is far higher than the current control group. Accordingly, expenditure per capita of current beneficiary is (2719.1) also notably higher than the current control group. More specifically, current beneficiary group spend more on food (3035.5) rather than non-food expenditure (2749.9). Current control group, similarly, spends more money on food expenditure and less on non-foods yet total expenditure is lower than the current beneficiary group.

Table 3.2: Asset Holding among SWAPNO Second Cycle Households

		Productive asset	Financial asset	Consumer durables	Total asset	Asset per capita
Current beneficiary	Mean	24583.4	5972.4	7150.3	37706.1	19624.2
	SD	26043.2	11607.1	7339.7	29944.3	20011.8
Current Control	Mean	7426.5	589.0	4455.8	12471.3	5282.4
	SD	14812.8	4091.8	4266.5	17093.4	7355.0
All	Mean	16671.3	3489.8	5907.7	26068.8	13010.4
	SD	23224.1	9350.9	6259.9	27850.2	17077.7

Table 3.2 represents the mean value of household current asset value and standard deviation (SD) of current beneficiary and current control groups. It is a matter of fact that, current per capita asset value of current beneficiary is nearly 4 times higher than the current control group. Surprisingly more than 64% of the asset value of current beneficiary come from productive asset. Mean value of financial asset of them is 5972 and the remaining asset come from consumer durables. Like beneficiary group, nearly 60% of total asset of the control group come from farm asset. One the other hand, only 589 BDT of asset come from financial asset and the mean value consumer durables is 4455 BDT.

Table 3.3: Income among SWAPNO Second Cycle Households

		Farm Income	**Non-farm income**	**Transfer Income**	**Total Income**	**Income per capita**
Current beneficiary	Mean	1757.8	14265.1	221.8	16240.7	7577.8
	SD	4660.3	6399.9	664.6	8613.9	4103.3
Current Control	Mean	475.8	8982.6	521.4	9979.8	3932.0
	SD	1535.8	6690.7	2142.3	7118.6	2764.3
All	Mean	1165.9	11829.0	360.0	13353.4	5896.5
	SD	3629.7	7042.9	1540.6	8545.6	3986.1

Table 3.3 illustrates the household income of current beneficiary and control group. It is clear from this table that, most of the income come from non-farm income for both current beneficiary and current control group; 81% for beneficiary group and 77% for control group. There is a huge difference in per capita income among current beneficiary and control households. Per capita income of the beneficiary households (7578) are almost double than the control households (3932).

3.2 Household food security and dietary diversity

To explain the food availability of households and quality of food they consume, we have used Household Dietary Diversity Score (HDDS), Dietary Diversity (DDS) Score for women and Household Food Insecurity Access Scale (HFIAS[11]). However, in terms of dietary diversity score, weekly consumption recall is used in HDDS and 24-hour recall is used for DDS women. The method of HDDS and HFIAS are given below:

Household Dietary Diversity Score (HDDS) and Women Dietary Diversity Score: In measuring dietary diversity for households and women, the number of different food groups consumed are calculated rather than the number of different foods consumed. This assumes that a household's consumption from six different food groups is better than the consumption of six different foods from the same food group, for example: consumption of different types of cereals. According to the U.N. Food and Agriculture Organization (FAO), there are twelve food groups. The following food groups are used to calculate the HDDS: Cereals, Roots and tubers, Vegetables and Leafy Vegetables, Fruits, Meat and poultry, Eggs, Fish and seafood, Pulses/nuts, Milk and milk products, Oil/fats, Sugar and honey, and Miscellaneous. The value of HDDS varies from 0 to 12; 12 means maximum diversity and 0 means no diversity.

Household Food Insecurity Access Scale: HFIAS measures the scale of household food insecurity based on nine questions regarding the state of food security in the last four weeks. All the nine questions are related to the availability of food in the household during the referred period of four weeks.

Table 3.4: Median dietary diversity score among SWAPNO second cycle households

Type	HDDS	HDDS Women	No. of observation
Current beneficiary	9	8	437
Current control	8	7	374
All	8	7	811

Table 3.4 delineates the distribution of the median dietary diversity score SWAPNO second cycle among current beneficiary and current control group. It shows that, median of HDDS of current beneficiary is 9 which is higher than the current control group (8). Similar image can be seen for

[11] Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator Guide, VERSION 3, FAO-2007

the median of HDDS Women where median of current beneficiary is 8 which is higher than the Current control group.

Table 3.5: Proportion of SWAPNO second cycle households having median and above dietary diversity

Median and above dietary diversity	Current beneficiary	Current control
No	155	253
	35.47	67.65
Yes	282	121
	64.53	32.35
Total	437	374
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 3.5 demonstrates total number and percentage of households having median and above dietary diversity scores. Among the current beneficiary households, 64.5 percent have median or above bear dietary diversity, which is nearly twice more than the current control group (32.35%) indicating significantly higher dietary diversity for beneficiary households.

Table 3.6: Proportion of SWAPNO Second Cycle Households Having Median and above Women Dietary Diversity

Median and above dietary diversity for women	Current beneficiary	Current control
No	196	205
	46.01	57.10
Yes	230	154
	53.99	42.90
Total	426	359
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Enumerating the number of households having median and above women dietary diversity score, Table 3.6 also illustrates the percentage difference of current beneficiary and current control group. Among the beneficiary households, 54% women attained median and above dietary diversity, while it is 43% for the control households.

Table 3.7: Food Insecurity Access Scale among SWAPNO Current Cycle Households

	Current beneficiary	Current control
Food Secure Access	354	119
	81.01	31.82
Mildly Food Insecure Access	56	95
	12.81	25.40
Moderately Food Insecure Access	25	130
	5.72	34.76
Severe Food Insecure Access	2	30
	0.46	8.02
Total	437	374
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Enumerating the Household food insecurity access scale, table 3.7 represents several food insecure categories of current beneficiary and control groups. Percentage of current beneficiary of food secure access (81%) is far higher than the current control group food secure access (32%). On the other hand, percentage of mildly, moderate and severe food insecure access are significantly higher for current control group. In the severe food insecure access category, percentage of current control group (30%) is exactly 15 times higher than the current beneficiary group indicating more insecure access.

3.3 Adult and child Nutrition

Child and adult nutrition are used to observe the outcome of the economic and social wellbeing. Therefore, in our case, when an intervention happened to beneficiary households, they might be better off in terms of adult and child nutrition. However, adult body mass index (BMI) might not change in the short term of the project intervention. We have used child height-for-age z-score (HAZ), weight-for-height z-score (WHZ) and weight-for-age z-score (WAZ) to measure the stunting, wasting and underweight respectively. To measure the nutrition category, we have used WHO 2006 cut offs which are globally used. However, to measure adult nutrition, we have used standard Body Mass Index (BMI[12]).

[12] The definition adopted is as follows: BMI= weight in kg/ (height in meter)^2, severe under-weight if BMI<16, underweight if 16<=BMI<18.5, normal if 18.5>=BMI<25, overweight if 15<=BMI<30, and obese if BMI>=30.

Table 3.8: Male Adult BMI of the SWAPNO Current Cycle Households

	Current beneficiary	Current Control
Severe underweight	54	71
	15.38	18.93
Underweight	39	25
	11.11	6.67
Normal weight	89	100
	25.36	26.67
Overweight	6	15
	1.71	4.00
Obesity	163	164
	46.44	43.73
Total	351	375
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 3.8 delineates the BMI of male adult of the current beneficiary and current control group where row of the table represents the different state of BMI. At first, current control group has higher severe underweight adult than the current beneficiary group (3% more). Current beneficiary households, however, have around 5% more underweight than the current control group. Likewise, current control households have slightly more normal weight (26.67%) than the current beneficiary households (25.36%). But current control households' overweight level (4%) is higher than the current beneficiary group (1.7%). Alternatively, obesity level is higher for the beneficiary group (46.44%) than the current control group. overall the result may fluctuate but the average BMI is better for control group. The possible reason why beneficiary households are not doing better in some of the BMI categories might be the hard physical labour they are doing for the public works.

Table 3.9: Female Adult BMI of the SWAPNO Current Cycle Households

	Current beneficiary	Current Control
Severe underweight	74	65
	10.12	9.48
Underweight	85	86
	11.63	12.54
Normal weight	367	340
	50.21	49.56
Overweight	94	69
	12.86	10.06
Obesity	111	126
	15.18	18.37
Total	731	686
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 3.9 demonstrates the BMI of adult particularly for the women. Current beneficiary group has slightly higher severe underweight than the current control group. Current control group (12.54%), on the other hand, have more underweight people (11.63%) but difference is not significant. In terms of overweight and severe underweight both current beneficiary and current control groups show pretty similar results. Current control households, however, have nearly 3% more obese female member than the current beneficiary group (15.8%). Overall, current beneficiary households have higher severe underweight, normal weight and overweight but current control households have more obese and underweight.

Table 3.10: Prevalence of Stunted Children (below 5) among SWAPNO Second Cycle Households

	No	Yes
Current beneficiary	21	9
	70.00	30.00
Current control	23	14
	62.16	37.84
Total	44	23
	65.67	34.33

Note: First row has *frequencies* and second row has *row percentages*.

Table 3.10 represents the children's stunted status of current beneficiary and current control groups. It is seen that current control group have 7% more stunted children than the current beneficiary where the stunted percentage is 30% for current beneficiary group and 37% for control group. Therefore, there is a significant improvement for the current beneficiary households in terms of the child stunting.

Table 3.11: Prevalence of Wasted Children (below 5) among SWAPNO Second Cycle Households

	No	Yes
Current beneficiary	19	10
	65.52	34.48
Current control	23	10
	69.70	30.30
Total	42	20
	67.74	32.26

Note: First row has *frequencies* and second row has *row percentages*.

Opposite outcome found for the wasted status of the current beneficiary and current control households in table 3.11. It is a matter of fact that, though they are beneficiary group, still they have 4% more wasted child than current control (30.3%). Wasted indicator sometimes misleading due to short term health shock's effect on weight of the children. Children of the beneficiary

household might have suffered for illness which deteriorated their weight-for-height z-score.

Table 3.12: Prevalence of underweight children among SWAPNO second cycle households

	No	Yes
Current beneficiary	19	11
	63.33	36.67
Current control	18	19
	48.65	51.35
Total	37	30
	55.22	44.78

Note: First row has *frequencies* and second row has *row percentages*.

Table 3.12 illustrates the Underweight status of children among current beneficiary and current control group. In here, 36.7% children of the current beneficiary group are underweight, and 51.3% children of the control households are underweight, and the difference between beneficiary and control group is remarkable here.

3.4 Subjective wellbeing

Table 3.13 enumerates the aspiration status of the respondents in several categorical aspects.

Table 3.13: Aspirations about the Future of Current Cycle Households

	Current beneficiary	Current control
Not at all optimistic	6	56
	1.37	14.97
Slightly optimistic	109	175
	24.94	46.79
Optimistic	265	127
	60.64	33.96
Very optimistic	57	16
	13.04	4.28
Total	437	374
	100.00	100.00

Note: First row has *frequencies* and second row has *row percentages*.

Overall, the current beneficiary households are far more optimistic than the current control. The percentage of 'not at all optimistic' level of current control group is remarkably higher (15%), where current beneficiary group showed a percentage which is next to nothing. Whereas, current beneficiary group showed more than twice level of status in terms of Optimistic and slightly optimistic category. Finally, 13% of the current beneficiary households are very optimistic category about their future which is 9% higher than current control households.

Table 3.14: Aspirations about Children of the Current Cycle Households

	Current beneficiary	Current control
Not at all optimistic	4	12
	0.90	3.23
Slightly optimistic	66	112
	15.21	30.11
Optimistic	135	113
	30.8	30.38
Very optimistic	161	77
	37.10	20.70
Not applicable	71	58
	16.36	15.59
Total	437	372
	100.00	100.00

Note: First row has *frequencies* and second row has *row percentages*.

Enlisting several optimistic categories, table 3.14 delineates the aspiration about the children of current beneficiary and current control groups. This table shows that current beneficiaries are mostly responsive at optimistic (31%) and very optimistic (37.10%) level. Current control group on the other hand, are mostly responsive at slightly optimistic (30%) and optimistic (30.1%) categories.

Table 3.15: Present subjective Food Condition of the Current Cycle Households

Subjective Food-Poverty	**Current beneficiary**	**Current control**
Always deficit	3	29
	0.69	7.75
Sometimes deficit	30	193
	6.86	51.60
Neither deficit nor surplus	179	126
	40.96	33.69
Surplus	225	26
	51.49	6.95
Total	437	374
	100.00	100.00

Note: First row has *frequencies* and second row has *row percentages*.

Table 3.15 represents the present subjective food condition for both current beneficiary and current control groups. Overall, for current beneficiary group, foods are almost surplus (more than half of them). Alternatively, for current control group they face sometimes deficit as more than half of them reported that foods are sometimes deficit (51.6%). Nevertheless, a substantive amount of control households reported that foods are neither deficit nor surplus but, in this regard, current beneficiary group are more responsive (41%) than the current control group (34%).

Table 3.16: Previous (5 years ago) Subjective Food Condition of the Current Cycle Households

Subjective Food-Poverty	Current beneficiary	Current control
Always deficit	179	183
	40.96	48.93
Sometimes deficit	214	125
	48.97	33.42
Neither deficit nor surplus	35	57
	8.01	15.24
Surplus	9	9
	2.06	2.41
Total	437	374
	100.00	100.00

Note: First row has *frequencies* and second row has *row percentages*.

Table 3.16 illustrates the previous (5 years ago) subjective food condition of both current beneficiary and current control groups. For both cases foods weren't surplus enough because only around 2% of current beneficiary and control group think that foods were surplus. On the other hand, both groups think that foods were always in food deficit, but current control groups are ahead in this case. Similarly, around half of the current beneficiary think that foods were sometimes deficit 5 years ago and 33.42% of current control group think the similar way. However, 15.24% of current control households think that the food items were neither deficit nor surplus but half of this percentage of current beneficiary thinks to the same way.

Table 3.17: Present Economic Condition of the Current Cycle Households

Subjective Well-Being	Current beneficiary	Current control
Very poor	15	129
	3.43	34.49
Poor	327	194
	74.83	51.87
Lower middle class	81	43
	18.54	11.50
Middle class	14	8
	3.20	2.14
Total	437	374
	100.00	100.00

Note: First row has *frequencies* and second row has *row percentages*.

Table 3.17 represents the present economic condition of both current beneficiary and control group. Overall, current beneficiary group are poor and current control group live below the poverty level that means around 85% of current control groups are either poor or very poor. On the contrary, very few people from both current beneficiary (3.20%) and control group (2.14%) are from middle class. Additionally, 19% of current beneficiary and more than 12% of current control

are from lower middle class.

Table 3.18: Previous (5 years ago) Economic Condition of the Current Cycle Households

Subjective Well-Being	Current beneficiary	Current control
Very poor	307	234
	70.25	62.57
poor	114	118
	26.09	31.55
lower middle class	15	20
	3.43	5.35
middle class	1	2
	0.23	0.53
Total	437	374
	100.00	100.00

Note: First row has *frequencies* and second row has *row percentages*.

Table 3.18 represents the economic condition of current beneficiary and current control group of 5 years ago. In both cases nearly 95% of all people were either poor or very poor. Thus, very few people from current beneficiary are from lower middle class (3.43%) and less than 0.5% current beneficiary are from middle class.

Overall economic status has been improved for both the current beneficiary and current control households within five-year span. However, this improvement is higher for the beneficiary households.

3.5 Women Empowerment

In this section we are assessing how women empowerment has changed over time between the two groups of households. The latter can be variously defined; in this study, we adopted a restricted definition in terms of (a) physical mobility of women and (b) ability to participate in the household decision making. In this exercise, we define empowerment as the ability to physically move alone outside the sphere of domesticity.

Table 3.19: Percentage of Women Having Mobility Outside Home

Whether can move alone:	Current beneficiary	Current Control
Mobility outside home	100	98.4
Mobility outside community (para/village)	99.31	97.33
Mobility within the Union territory	98.63	93.32
Mobility within the Upazilla territory	88.33	71.39

Mobility within district or Divisional city	60.64	36.63

Table 3.19 presents the results. In terms of 'mobility within upazilla' and 'mobility within divisional city' the difference between beneficiary and control households is particularly pronounced, suggesting favorable project effects. Similar level of attainment in respect of other mobility indicators across project and control groups is indicative of broad gains in female physical mobility achieved in general in rural Bangladesh.

Table 3.20 Percentage of Women Participating in the Household Decision Making

Decision pertaining to:	Current beneficiary	Current Control
New income earning activities	93.14	81.94
Availing services (treatment, recreation)	92.68	82.8
Education/training	88.52	53.91
Participation in meeting/rallies	75.54	37.39
Buying and selling assets (land, furniture)	80.43	54.49
Buying and selling ornaments	77.72	53.56
Buying and selling livestock and poultry	85.45	64.47
Buying and selling vegetables, fruits, trees	86.34	68.9
House construction and repair	81.63	60.87
Children education	84.25	63.49
Children marriage	70.79	52.03
Children health care	76.81	60.26

Table 3.20 compares women's decision making power across beneficiary and control households. In all the cases, percentage of the women having decision making power are significantly higher for beneficiary households than that of the control households. In summary, women from the beneficiary households have more physical mobility and greater decision making power than the control households.

3.6 Social Asset

In this section, we compare the social asset position across current beneficiary and current control households. Here, we have defined participation in the socio-economic institution and Government or Non-Government social services as social asset.

Table 3.21: Percentage of the Households Participated in the Socio-economic Institution

Institution	Current beneficiary	Current control
Bank	50.3%	6.4%
NGO	16.0%	15.2%
Village Court	9.4%	2.4%
Arbitration (Shalish)	8.0%	5.3%
Social activities	15.1%	5.1%
Political party	0.9%	0.0%
Union Council	87.9%	83.7%
Other	1.4%	0.5%

Table 3.21 shows the participation of the households in the socio-economic institutions. In all the eight categories of socio-economic institutions, participations of the beneficiary households are higher than that of the control households. The difference is highest in terms of bank and lowest in terms union council.

Table 3.22: Attaining Union and Upazilla Social Services

	Current beneficiary		Current Control	
Type of services	Government	Non-Government	Government	Non-Government
Agriculture	91.3%	60.0%	47.9%	27.3%
Livestock	97.0%	70.0%	63.4%	45.5%
Fisheries	92.4%	62.7%	43.9%	17.1%
Health Services (Child and mother related)	97.3%	76.4%	76.2%	47.6%
Information and technology services (computer, e-payment etc.)	89.7%	66.8%	55.9%	30.2%

Table 3.22 shows the comparison in the attainment of Union and Upazilla social services. In all the five categories of social services, attainment of the beneficiary households is higher than that of the control households and it is higher for government than that of non-government.

In essence, both in terms of participating in the socio-economic institution and attainment of social services, beneficiary households are more involved than the control households.

3.7 Ordinary Least Square (OLS) Regression Results

So far we have discussed the relative importance of individual factors in creating the observed difference between the project participants and non-participants. However, it is important to consider them together as they act not in isolation and in unison like a collective influence. For that, we need to consider a multivariate approach, which can shed light on the robust correlates of per capita income, per capita consumption expenditure and per capita non-land assets—the three key indicators of economic well-being. The Ordinary Least Square estimates of the correlates are presented in Table 3.23.[13]

Table 3.23: Covariates of Per Capita Income, Expenditure and Non-Land Assets across the Treatment and Control Groups: The OLS Estimates

Variables	Income Per capita	Consumption Expenditure Per Capita	Non-land Asset Per Capita
Current dummy (beneficiary=1)	3042.3***	995.6***	10054.6***
	(-12.93)	(-4.01)	(-13.26)
Age of HH head	75.59***	12.13*	65.49
	-5.1	-2.27	-1.19
Marriage before age 15 (yes=1)	-49.7	59.72	760.2
	(-0.19)	-0.34	-0.82
Literacy dummy (can sign or read/write letter)	358.9	264.6	-1583.6
	-0.71	-1.7	(-0.84)
Married dummy (yes=1)	605	97.22	2529.8*
	-1.78	-0.82	-2.56

[13] OLS regression is a statistical method of analysis that estimates the relationship between one or more explanatory variables and a dependent variable; the method estimates the relationship by minimizing the sum of the squares in the difference between the observed and predicted values of the dependent variable. It predicts the average change in dependent variable due to average change in the explanatory variables.

Variables	Income Per capita	Consumption Expenditure Per Capita	Non-land Asset Per Capita
Previous asset pc	0.0990***	0.0103	1.112***
	-5.12	-1.21	-7.72
Phone dummy (yes=1)	206	-190.9	-188.7
	-0.79	(-0.87)	(-0.20)
Using MFS (yes=1)	-274.4	-182.3	-943
	(-0.99)	(-0.60)	(-0.70)
Having MFS account (yes=1)	-207.5	217	1006
	(-0.69)	-0.64	-0.71
Aspiration about self (base: not at all optimistic)			
1. Slightly optimistic	-102.3	41.39	644.4
	(-0.27)	-0.14	-0.58
2. Optimistic	550.6	-166.1	1893.2
	-1.26	(-0.54)	-1.21
3. Very optimistic	1407.2*	-129.1	4739.8
	-2.23	(-0.38)	-1.9
Aspiration about children (base: not at all optimistic)			
1. Slightly optimistic	1498.7**	124	1825.9
	-2.92	-0.45	-1.38
2. Optimistic	1084.2*	238	1473.2
	-2.14	-0.94	-1.01
3. Very optimistic	752.6	421.2	411.9
	-1.35	-1.48	-0.22
4. Not applicable	2249.4***	1269.4**	5250.5**
	-4.19	-2.93	-3.01
Food condition 5 years ago (base: always deficit)			
1. Sometime deficit	-518.4*	-116.3	1406.2
	(-2.15)	(-0.73)	-1.38
2. Enough	-69.98	195	598.7
	(-0.16)	-0.79	-0.35
3. Surplus	-793.4	407.7	-2373.2
	(-1.70)	-1.31	(-0.97)
HH Size AE	-1214.1***	-439.4***	-2620.4***
	(-8.40)	(-7.57)	(-5.55)
Having combined shock (yes=1)	-1002.0***	53.25	-1789.6
	(-4.01)	-0.31	(-1.77)
Having individual shock (yes=1)	-481.4	84.08	-1037.6
	(-1.90)	-0.54	(-1.00)

Variables	Income Per capita	Consumption Expenditure Per Capita	Non-land Asset Per Capita
Upazilla (base category: Bhurunganmari)			
1. Char Rajibpur	137.2	-565.8*	-3055.1
	-0.2	(-2.46)	(-1.31)
2. Chilmari	-188.1	-667.5*	2368.6
	(-0.31)	(-2.36)	-0.98
3. Kurigram Sadar	246.7	-115.6	-4417.5
	-0.35	(-0.40)	(-1.78)
4. Nagesshori	-368.5	16.18	-3099.6
	(-0.76)	-0.08	(-1.65)
5. Fulbari	-319.9	409.2	-4381.6
	(-0.63)	(-0.83)	(-1.86)
6. Rajarhat	-447.8	429.4	-418.2
	(-0.82)	(-1.86)	(-0.17)
7. Rowmari	-467.3	216.4	-4076.8
	(-0.94)	(-0.31)	(-1.63)
8. Ulipur	-218.5	-637.7***	334.4
	(-0.39)	(-3.78)	(-0.13)
9. Assasuni	-928.5	-340.8	733.4
	(-1.88)	(-1.81)	-0.26
10. Debhata	-172.6	200	-167.4
	(-0.37)	(-0.86)	(-0.08)
11. Kaligonj	171.6	297.2	-4880.3*
	(-0.3)	(-1.32)	(-2.37)
12. Shemnagar	-261.9	446.6	-3063.7
	(-0.50)	(-1.8)	(-1.25)
13. Tala	-160.2	-138.3	-2805.6
	(-0.26)	(-0.68)	(-1.22)
Constant	2108.8*	1526.7***	4123.4
	(-2.21)	(-4.44)	(-1.19)
Observations	811	811	811
R-squared	0.435	0.193	0.511

Note: t-statistics are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3.19 illustrates the regression results on income per capita, expenditure per capita and asset per capita among current beneficiary and control households of the SWAPNO project. It is seen that, current beneficiaries are better off in all the categories- income, expenditure and asset. Controlling for previous asset, past food condition, aspirations, regions and other household characteristics, beneficiary households on an average have 3000 BDT higher monthly income,

1000 BDT higher monthly expenditure and 10,000 BDT higher asset than the control households who are not in the SWAPNO project.

Among the other household characteristics, age of the household head has significant positive association with income and expenditure, value of the previous household asset has significant positive association with income and asset, some aspirations have significant positive association with income, expenditure and asset, both individual shocks and combined shock have some negative associations with income and asset but not with expenditure.

Household size has significant negative associations with income, expenditure and asset. Everything's remaining constant, a member increase in household is associated with 1200 BDT decrease in income, 400 BDT decrease in expenditure and 2600 BDT decrease in current asset. Marital status has positive and significant association with income and asset but not with expenditure. If the beneficiary or potential beneficiary is married rather than unmarried/divorcee/separated, households have 2500 BDT asset value.

To sum up, controlling for household and regional characteristics, current beneficiary households are better in all indicators like income, expenditure and asset than the current control households.

Chapter 4: Impact Assessment through Propensity Score Method (PSM) and Difference-in-Difference (DID) Method

In the preceding section, we discussed the correlates of per capita income, per capita consumption expenditure and per capita non-land assets as well as assessed the potential effects of project participation. However, analysis of the cross-sectional variation in outcome indicators was limited to the *current round* only and hence is subjected to *selection biases* that may have confounding influences on judging the welfare comparisons between beneficiary and control groups. In making such claims so far, we may have been comparing "apples" and "oranges". In order to address this problem, we use the Propensity Score Method (PSM) to select a sub-sample of project and control groups conditional on key markers exogenous to the participation in the SWAPNO project.

4.1 The PSM Approach

The benefit of PSM approach is that it allows to identify a set among the control households that are like the characteristics of the project households in every other aspect except with respect to the project participation. It is important to remember two issues about matching. First, matching needs to be carried out by using "background characteristics", and second, the matching method is only as good as the markers that are used for matching, so that having many background characteristics is vitally important. In order to do the matching, we must pool the two project and control samples, and calculate the probability that everyone participates in the project based on the individual characteristics observed in the survey. Given that the participation is expressed in a binary outcome (1 for participation, and 0 for non-participation) we use the logistic regression for generating the propensity score. The basic logistic regression run for generating the propensity score is captured in Table 4.1.

Table 4.1: Logistic Regression used for the Propensity Score Model: Comparison between Project Beneficiary and Control Members

Current Beneficiary (1) vs. Control (0)	Coefficient	Z
Age of HH head	-.032943	-0.46
Age Squared	.0001638	0.19
Marriage after age 15 (yes=1)	-.1465213	-0.84
Female headed household (yes=1)	.9408906	**2.37**
Household having any child below 6 years (yes=1)	-.3222198	-1.18
Household having elderly above age 60 (yes=1)	-.1266779	-0.52
Marital Status (Married=reference category)		
Divorced	.7671789	**2.44**
Abandoned	.2556363	0.87
Widow	.8750479	**3.02**
Education of HH head ('no formal education'=reference category)		
Below Primary	-.1434345	-0.53
Primary	-.3903757	-0.83
Below SSC	-.5157761	-1.18
SSC and above	-.2757859	-0.31
Literacy ('cannot sign'==reference category)		
Can only sign	1.235706	**3.25**
Can read and write	1.371709	**2.71**
Whether Main Earner (yes=1)	.6232916	**2.28**
Previous asset per capita	.0000514	**3.75**
Mobile Phone dummy (yes=1)	.9457131	**4.76**
Household size	-.0124065	-0.15
Having combined shock (yes=1)	-.8474384	**-4.32**
Having individual shock (yes=1)	-.0196238	-0.11
Pseudo R2	0.1410	
Number of Observations	799	

Note: The model also controls for upazilla level fixed effects.

Based on this model, we estimate the income, expenditure and non-land assets differences between PSM-matched sample of the project beneficiaries and control groups households. The robustness of the results has been checked by using different calipers (Table 4.2).

Table 4.2: Propensity Score Matching Results for the End-line Survey: Comparison of Income, Expenditure and Non-Land Assets between Project Members and Control Households

Type	Income PC (caliper 0.25)	Income PC (caliper 0.0005)	Expenditure PC (caliper 0.25)	Expenditure PC (caliper 0.0005)	Asset PC (caliper 0.25)	Asset PC (caliper 0.0005)
Current beneficiary	7337	6941	2708	2632	17604	17933
Current control	4267	4192	1765	1816	6986	6268
Difference	**3070**	**2749**	**943**	**815**	**10618**	**11665**
T-Stat	9.97	6.99	5.87	3.74	10.35	7.80

The results presented in Table 4.2 shows a clear edge of the project members over the control group in all three respects. For caliper 0.25, the income differential is 72% higher for members compared to the members; the matched difference for consumption expenditure is 53%, while the corresponding gap is as high as 152%. These differences are robust to the choices of calipers and precise methods chosen of propensity matching. This is indeed a big effects of project intervention on the beneficiaries by any standard.

The limitation of PSM method is that we assume that no systematic differences in unobserved characteristics between the treatment and the control group exists that could influence observed outcome. As Gertler et al (2011) puts it, "Since we cannot *prove* that no such unobserved characteristics that affect both participation and outcomes exist, we have to *assume* that none exist. This is usually a very strong assumption…and most problematic, it cannot be tested."

4.2 The Difference-in-Difference Approach

Since we have baseline data, it would have made sense if we rather use the "difference-in-differences" (DID[14]) or the "double difference" technique, which accounts for time-invariant, unobserved heterogeneity. One problem though is using the DID method is that we cannot rely on the quality baseline data generated by another survey agency where the distribution of non-sampling errors is unknown. Ignoring the potential biases that may occur due to this, for now, we venture on testing the robust of the PSM results by using the DID method. Before we proceed to deploy the DID method, let us first concentrate on the directionality of differences by netting out

[14] Difference in differences (DID) is a tool to measure the treatment effects by comparing the pre- and post-treatment differences in the outcome of a treatment and a control group. Here, outcome may include income, expenditure, asset, food security, nutrition, or any variable of interest. Here, we examine the matched difference in respect of current income, consumption expenditure and non-land assets of the program households as compared to the level prevailing in the beginning of the SWAPNO project (compared to the corresponding difference in the control group).

the changes that have been observed in the treatment and the control group over the duration of the current cycle of 2017-19. This will give us a first-cut indication about what is happening with the project intervention.

Table 4.3: Simple difference-in-difference in income, expenditure and non-land asset

Baseline			
Type	Income PC	Expenditure PC	Asset PC
Current beneficiary	719.8	1030.4	2423.5
Current control	917.5	990.5	3052.0
Difference	**-197.7**	**39.9**	**-628.6**
End-line			
Type	Income PC	Expenditure PC	Asset PC
Current beneficiary	7585.1	2724.0	19664.9
Current control	3936.6	1702.6	5260.7
Difference	**3648.4**	**1021.4**	**14404.2**
Difference-in-difference	**3846.1**	**981.5**	**15032.8**

Table 4.3 shows the simple "difference-in-difference" in income, expenditure and asset among the SWAPNO second cycle beneficiary and control households. On the average, current beneficiary households have 38046 BDT higher monthly income per capita, 981 BDT higher monthly expenditure per capita and 15032 BDT higher per capita asset value than that of the control households. However, two out of three indicators, control households were slightly better off in baseline survey period.

Simple difference-in-difference in a panel data setting, however, does not control for the *unobserved heterogeneity in time-invariant factors*, not does it control for the differences in factors that are *exogenous* to participation in the project that can be *observed*. This requires the use of a multivariate framework of the type discussed earlier (see, Section 1.5).

Table 4.4: Project Impacts on Income, Expenditure and Non-Land Asset Using Pooled OLS Regression with Time-Beneficiary Interaction

	Income PC	Expenditure PC	Asset PC
Beneficiary dummy (Yes=1)	-386.4***	-40.68	-297.8
	(-6.16)	(-0.95)	(-1.43)
Time and beneficiary interaction	3793.4***	989.0***	11541.4***
	(-15.73)	(-6.38)	(-13.68)
Time dummy (End-line=1)	3495.0***	717.9***	2094.2***
	(-16.72)	(-8.11)	(-3.63)
Age of the HH head	47.29***	15.13***	40
	(-4.97)	(-4.31)	(-1.14)
Married dummy (yes=1)	-438.3*	-295.2***	-645.7
	(-2.45)	(-4.50)	(-1.62)
Head's level of education (base: no formal schooling)			
1. Less than primary	-340.2*	-108.6	689.7
	(-2.36)	(-1.35)	-1.01
2. Primary completed	-12.1	40.33	-415.8
	(-0.06)	-0.44	(-0.78)
3. Secondary Completed	12.11	721.1	203.9
	(-0.03)	(-1.12)	(-0.37)
4. Higher secondary completed	3235.7	400.5	-1966.3
	(-0.8)	(-0.44)	(-0.38)
Previous asset pc	0.0590***	0.0173***	1.090***
	(-5.95)	(-3.84)	(-15.35)
Faced covariate shock (yes=1)	-1132.9***	-95.33	-1661.3
	(-4.83)	(-0.46)	(-1.89)
Faced individual shock (yes=1)	-608.8*	-43.2	-641
	(-2.52)	(-0.31)	(-0.66)
Constant	-941.4*	428.1**	-1743.8
	(-2.55)	(-3.02)	(-1.24)
R-squared	0.602	0.203	0.580
Number of observations	1597	1597	1597

Note: t-statistics are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4.4 presents the results from pooled regression of the current beneficiary and current control households combining the indicators of the baseline and endline surveys. The coefficient on the "time and beneficiary interaction" variable shows the project impact on beneficiary households. It shows that, compared to control households, beneficiary household's average income per capita has increased by BDT 3800; average expenditure per capita increased by BDT 1000; and average asset per capita increased by BDT 11,500 between the baseline and endline surveys. Among the

other explanatory variables, both covariate and individual shocks have negative impacts on all three outcome variables. In contrast, initial non-land assets and age of the household head have positive impacts. *The unescapable conclusion is that SWAPNO intervention has benefited the participants compared to the control group by all economic indicators.* This is a result that truly needs to be celebrated.

Table 4.5: Absolute Difference between Current Beneficiaries and Control Groups: Summary of Welfare Comparisons by Different Methods

Indicators	OLS	DID (Simple Difference)	DID (Regression method)	PSM
Per Capita Monthly Income	3,042	3,846	3793	3,070
Per Capita Monthly Expenditure	996	982	989	943
Per Capita Current Asset	10,055	15,033	11541	10618

Note: The figures represent absolute difference in current BDT that the beneficiary group has over the control group.

Table 4.5 summarizes the results by comparing average income, expenditure and non-land assets per capita according to three methods: (a) Ordinary Least Square (OLS); (b) Difference-in-Difference (DID); and (c) Propensity Score Matching (PSM) methods. All three methods show *almost similar* edge of the beneficiary group over the control group. SWAPNO beneficiary households, on an average, have BDT 3000-3800 BDT higher monthly income per capita, BDT 980-1000 higher monthly expenditure per capita and BDT 10,000-15,000 current asset per capita. This gives us confidence—combined with the fact of relative advantage noted earlier on account of subjective well-being indicators—about the significant positive effects of the SWAPNO project (see also Box-3).

Box 3: Positive Economic and Social Impact of SWAPNO project[15]

- All the beneficiaries lived as ultra-poor before participating in the SWAPNO project
- 90% of them are better-off now
- Training has enabled them to start income generating activities
- From the SWAPNO project they had *regular* income and employment. They did not have regular income and employment before: most worked as casual laborers or were severely under-employed
- Higher income and savings generated due to regular income
- Their reputation effects have gone up: they can easily borrow from the informal credit market in times of need
- Beneficiaries can now get help directly from agricultural extension service officers
- SWAPNO project officers and partners NGOs monitor IGAs of the beneficiaries on a regular basis
- "Cooperation has been increased among the beneficiaries", implying that *social capital* has increased among the group members, which may prove to be useful in times of crisis events
- Beneficiaries now have better decision making ability. They attribute it to the SWAPNO life-skill as well as livelihood training
- Increasing women empowerment through income and employment
- SWAPNO project not only helped the beneficiaries but also others in the community indirectly through the local-level public works
- Swapno helped to develop the networking of beneficiary households with local administration
- Beneficiaries now have better social status. Reasons are as follows:
    - They are viewed as a beneficiary of a govt. project
    - They now have better linkages with other local social services through SWAPNO project
    - They have now better social awareness and improved capacity building for undertaking economic decisions
    - They have better communication capacity and physical mobility
    - Their self-employment and land as well as non-land assets have increased
    - Housing condition has improved
    - Thy are now sending children to schools

[15] Evidence from FGDs, KIIs and Life Story Interviews

Chapter 5: Sustainability of the Project: Comparison between Current and Former Beneficiaries

The previous section indicates major gains from participation in the SWAPNO project and various impact evaluation methods confirmed this conclusion. We now need to ask ourselves a 'futuristic' question: *how long these gains from the project would last* especially in absence of the hand-holding of the beneficiaries on the part of SWAPNO organizers? Referring to the **S-Curve** in Figure 1 (see Section 1.2) we can interrogate whether project members just graduated from the current cycle would *remain for a long time in the riding part of the curve* at **point B** (and above) armed by organizational support and technological progress? Or, to the contrary, they would be plateaued at around **point C** and may even face *relative decline* without organizational support and commensurate technological progress? One way of approximating the problem is to look at the comparative performance of former beneficiaries as compared to current beneficiaries. This comparison rests on the assumption that both the groups belong to a "common gene pool" sharing the same characteristics: the only difference they have between themselves is the time of entry into the project. This may be a strong assumption in practice. Former beneficiaries may differ from the current pool in terms of *project content* even if the targeting criteria remained relatively unchanged between the cycles. However, we know from the qualitative interviews that the former beneficiaries had *less exposure to training* (with late start of the livelihood training courses only towards the end of the cycle), *less amount available for ROSCA* (hence less commitment device to savings), and have *slightly higher proportion of elderly population* (the range was "18 to 49 years" as opposed to "18 to 45 years" adopted subsequently) compared to the participants in the current cycle. All this will mean that the beneficiary comparisons between the two cycles may not reflect so much the "time effects"; rather they could be attributable to the effects of differing project designs. But, still, one can learn much about the project impacts by considering the current situation of the former beneficiaries: it can help pin-point the areas where the SWAPNO intervention needs to rethink itself.

Our discussion is organized here as follows. As in Section 3, we first discuss the cross-sectional differences in economic welfare as well as subjective measures of wellbeing between the former (SWAPNO first cycle)) and the current beneficiaries (SWAPNO second cycle). Subsequently, we adopt a multivariate framework using two distinct methods: the OLS model investigating the

correlates of the observed differences between the former and the current cycle beneficiaries, and then deploying the PSM method to arrive at a more refine estimate of the observed differences conditional on characteristics that are exogenous to the project participation. These comparisons will help to assess the *sustainability of the project impact* to improve economic and social conditions of the beneficiary households of the current as well as future cycles.

5.1 Income, expenditure and asset

Three most important indicators to judge the economic viability of any households are income, expenditure and asset. In that section we would like to deal with per capita household income, per capita household expenditure and per capita household non-land asset.

Table 5.1: Household Expenditure of the SWAPNO beneficiaries

		Food expenditure	Non-food expenditure	Total Expenditure	Expenditure per capita
Current beneficiary	Mean	3035.5	2749.9	5785.4	2719.1
	SD	1610.1	3205.7	3756.3	2653.9
Former beneficiary	Mean	2931.1	2356.2	5287.3	2361.7
	SD	1566.2	3792.3	4276.6	2947.5
All	Mean	2985.5	2561.3	5546.8	2547.9
	SD	1589.2	3502.5	4019.3	2802.4

Table 5.1 demonstrates the mean values of Household expenditure among current beneficiary and former beneficiary groups. Overall, household expenditure of current beneficiary is slightly higher than the former beneficiary group. Not only that, expenditure per capita of current beneficiary is (2719) also somewhat higher than the current control group. More specifically, current beneficiary group spend more on food expenditure (3035) rather than non-food expenditure (2750). Former beneficiary group, similarly, spends more money on food expenditure and less on non-foods yet total expenditure is lower than the current beneficiary group.

Table 5.2: Household Current Asset of the SWAPNO Beneficiaries

		Farm asset	Financial asset	Consumer durables	Total asset	Asset per capita
Current beneficiary	Mean	24583.4	5972.4	7150.3	37706.1	19624.2
	SD	26043.2	11607.1	7339.7	29944.3	20011.8
Former beneficiary	Mean	24423.1	5370.1	6887.5	36680.7	17298.6
	SD	27466.9	13566.6	9368.0	36301.0	18174.7
All	Mean	24506.6	5683.8	7024.4	37214.8	18509.9
	SD	26718.9	12580.1	8369.0	33126.4	19177.5

Table 5.2 represents the mean value of household current asset of current beneficiary and former beneficiary groups. It is seen that current per capita asset value of current beneficiary is higher to some degree than the former beneficiary group. Surprisingly, more than 64% of the asset value of current beneficiary come from farm asset and average value of financial asset of them is 5972 BDT. Remaining asset come from consumer durables. Like beneficiary group nearly 66% of total asset of former beneficiary group come from farm asset. One the other hand, only 5370 BDT of asset come from financial asset and the average consumer durables is 6888 BDT.

Table 5.3: Household Income of the SWAPNO Beneficiaries

		Farm Income	Non-farm income	Transfer Income	Total Income	Income per capita
Current beneficiary	Mean	1757.8	14265.1	221.8	16240.7	7577.8
	SD	4660.3	6399.9	664.6	8613.9	4103.3
Former beneficiary	Mean	3039.9	10195.6	1227.4	14462.8	6451.6
	SD	6021.2	8520.7	9570.1	15219.5	5805.1
All	Mean	2372.8	12315.2	703.6	15388.8	7038.2
	SD	5391.5	7758.2	6656.5	12257.1	5020.2

Table 5.3 illustrates the household income of current beneficiary and former beneficiary group. This table clearly shows that, most of the income come from non-farm income for both current beneficiary and former beneficiary group, 81.1% for beneficiary group and 57% for control group. In the meantime, the average per capita income of current beneficiary households is 7578 BDT, while for control households it is 6452 BDT.

5.2 Food security and dietary diversity scores

In this section, the comparison of HDDS and women DDS among beneficiary households of the two cycles will be compared.

Table 5.4: Median dietary diversity score among SWAPNO beneficiary households

Type	HDDS	HDDS Women	No. of observation*
Current beneficiary	9	8	426
Former beneficiary	9	8	359
All	9	8	785

Note: No. of observations are different from the overall sample distribution presented in other tables since there are cases where there are no women between 15-49 years of age.

Table 5.4 depicts the median dietary diversity score between current and former beneficiary households. For both HDDS and DDS Women, median dietary diversity shows no difference. Therefore, in terms of household food diversity and women dietary diversity both the current and former beneficiaries on an average are same.

Table 5.5: Proportion of SWAPNO Beneficiary Households having median and above dietary diversity

Median dietary diversity	Current beneficiary	Former beneficiary
No	155	175
	35.47	43.53
Yes	282	227
	64.53	56.47
Total	437	402
	100.00	100.00

Note: First row has frequencies and second row has column percentages.

In Table 5.5, we can see the comparison of median dietary diversity between current beneficiary and former beneficiary households where 65% of the current beneficiary households have median and above dietary diversity, while it is 57% for the former beneficiary households.

Table 5.6: Proportion of SWAPNO beneficiary households having median and above women dietary diversity

Women median dietary diversity	Current beneficiary	Former beneficiary
No	196	171
	46.01	45.84
Yes	230	202
	53.99	54.16
Total	426	373
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 5.6 represents the number of households having median and above women dietary diversity. Here, literally no significant variation can be seen between current beneficiary and former beneficiary, the former beneficiary women group has slightly more median dietary diversity than the current beneficiary though.

Table 5.7: Food Insecurity Access Scale (HFIA) among SWAPNO Beneficiary Households

	Current beneficiary	Former beneficiary
Food Secure Access	354	298
	81.01	74.13
Mildly Food Insecure Access	56	74
	12.81	18.41
Moderately Food Insecure Access	25	24
	5.72	5.97
Severely Food Insecure Access	2	6
	0.46	1.49
Total	437	402
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Enlisting the Household food insecurity access scales, table 5.7 represents food insecure access condition of current beneficiary and former beneficiary households. Percentage of current beneficiary falling under food secure access (81%) is higher than that of former beneficiary (74%). On the other hand, moderate and severe food insecure access prevalence are slightly higher for former beneficiary households. Over all, current beneficiaries are better off in terms of food insecurity categories.

5.3 Child and adult nutrition

In that section, prevalence of child and adult nutrition will be discussed across SWAPNO beneficiary households. So that project's sustainability can be checked in terms of nutrition.

Table 5.8: Male Adult BMI of the SWAPNO Beneficiary Households

	Current beneficiary	Former beneficiary
Severe underweight	54	40
	15.38	11.36
Underweight	39	34
	11.11	9.66
Normal weight	89	92
	25.36	26.14
Overweight	6	9
	1.71	2.56
Obesity	163	177
	46.44	50.28

Total	351	352
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 5.8 depicts the BMI of male adult for both currently beneficiary and former beneficiary households. Overall, the former beneficiary group seems to have an edge over the current beneficiary in terms of male BMI. Thus, *current beneficiary group have more severely underweight and underweight people among the adult males than the former beneficiary households*. By contrast, the *former beneficiary group reports more male overweight and obesity prevalence*. The result of normal weight and overweight percentage has not significantly different across beneficiary households.

Table 5.9: Female Adult BMI of the SWAPNO Beneficiary Households

	Current beneficiary	Former beneficiary
Severe underweight	74	55
	10.12	8.12
Underweight	85	115
	11.63	16.99
Normal weight	367	330
	50.21	48.74
Overweight	94	69
	12.86	10.19
Obesity	111	108
	15.18	15.95
Total	731	677
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Since the SWAPNO project considers only the female adults in the treatment group, it is more important to consider the nutritional status of adult female members. However, when female BMI is considered, a more complex picture emerges. This may be seen from Table 5.9 which presents distribution of BMI for female adult members. Current beneficiary group reports slightly more prevalence of "severe underweight" than the former beneficiary (10% vs. 8%). However, former beneficiary group has also greater proportion of "underweight" adult females (17% as against 11%). In terms of obesity both current beneficiary and formal beneficiary groups show similar results. *It seems that the current beneficiary households are suffering from the "double-burden of malnutrition": the BMI distribution for adult females has a bi-polar BMI distribution, having more "severely underweight" and "more overweight" at the same time.* Consequently, the issue of adult

anthropometry needs to be paid more attention in SWAPNO project, as no clear-cut advantage is discernible in former vs. current beneficiary comparisons.

Table 5.10: Prevalence of Stunted Children (below 5) among SWAPNO Beneficiary Households

	No	Yes
Current beneficiary	21	9
	70.00	30.00
Former beneficiary	11	5
	68.75	31.25
Total	32	14
	69.57	30.43

Note: First row has *frequencies* and second row has *row percentages*.

Table 5.10 represents the children's stunted status of current beneficiary and former beneficiary households, which suggests that there is no significant between current beneficiary and former beneficiary households.

Table 5.11: Prevalence of Wasted Children (below 5) among SWAPNO Beneficiary Households

	No	Yes
Current beneficiary	19	10
	65.52	34.48
Former beneficiary	8	7
	53.33	46.67
Total	27	17
	61.36	38.64

Note: First row has *frequencies* and second row has *row percentages*.

However, the comparative edge of the current beneficiary appears with respect to the other two child nutritional indicators (see, Tables 5.11 and 5.12): they are less likely to be wasted than former beneficiary households (34% as against 47%) and less likely to be underweight (37% vs. 44%).

Table 5.12: Prevalence of Underweight Children (below 5) among SWAPNO Beneficiary Households

	No	Yes
Current beneficiary	19	11
	63.33	36.67
Former beneficiary	9	7
	56.25	43.75
Total	28	18
	60.87	39.13

Note: First row has *frequencies* and second row has *row percentages*.

Table 5.12 illustrates the Underweight status of children among current beneficiary and former

beneficiary households. Children of the current beneficiary households are less likely to be malnourished than that of the former beneficiary in terms of underweight- 37% and 44% respectively for current and former beneficiary households.

5.4 Subjective wellbeing

In this section, we are going to discuss the subjective wellbeing of the current and former beneficiary households. Comparisons will be made between SWAPNO 2nd cycle beneficiary households and SWAPNO 1st cycle beneficiary households.

Table 5.13: Aspirations about the Future among SWAPNO Beneficiary Households

	Current beneficiary	Former beneficiary
Not at all optimistic	6	13
	1.37	3.23
Slightly optimistic	109	115
	24.94	28.61
Optimistic	265	233
	60.64	57.96
Very optimistic	57	41
	13.04	10.20
Total	437	402
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 5.13 enumerates the aspiration status of the respondents. Overall, the current beneficiary group are slightly more optimistic than the former beneficiary group. The percentage of 'not at all optimistic level' of current control group is a bit higher (3.23%), where current beneficiary group showed a percentage which is next to nothing. Whereas, current beneficiary group showed more status in terms of Optimistic and Very Optimistic category.

Table 5.14: Aspirations about the Children among SWAPNO Beneficiary Households

	Current beneficiary	Former beneficiary
Not at all optimistic	4	3
	0.92	0.75
Slightly optimistic	66	67
	15.21	16.7
Optimistic	135	147
	30.8	36.6
Very optimistic	161	119
	37.10	29.75
Not applicable (No Children)	71	66
	16.36	16.50
Total	437	402
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Enumerating several optimistic categories, Table 5.14 delineates about the aspiration about the children of current beneficiary and former beneficiary households. This table shows that current beneficiary households are mostly responsive at optimistic (30.8%) and very optimistic (37%) level. Former beneficiary group similarly are mostly responsive at optimistic (36.25%) and very optimistic (29.75%) categories. Both groups showed less interest at not at all optimistic category, current beneficiary group are slightly more responsive though.

Table 5.15: Present Food Condition of the SWANO Beneficiary Households

	Current beneficiary	Former beneficiary
Always deficit	3	2
	0.69	0.50
Sometimes deficit	30	50
	6.86	12.44
Neither deficit nor surplus	179	189
	40.96	47.01
Surplus	225	161
	51.49	40.05
Total	437	402
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 5.15 represents the present subjective food condition for both current beneficiary and former beneficiary households. Overall, for current beneficiary group foods are almost surplus (more than half of them). Alternatively, for former beneficiary households mostly foods are neither deficit nor surplus as nearly half of them reported that foods are neither deficit nor surplus (47%). Current beneficiary households are more likely have higher food rather than former beneficiary households.

Table 5.16: Previous (5 years ago) Food Condition of the SWANO Beneficiary Households

	Current beneficiary	Former beneficiary
Always deficit	179	218
	40.96	54.23
Sometimes deficit	214	148
	48.97	36.82
Neither deficit nor surplus	35	33
	8.01	8.21
Surplus	9	3
	2.06	0.75
Total	437	402
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 5.16 illustrates the previous (5 years ago) subjective food condition of both current beneficiary and former beneficiary households. For both cases foods weren't surplus enough because only around 2% of current beneficiary and 0.75% former beneficiary households reported that foods were surplus. On the other hand, both groups reported that foods were always deficit, but former beneficiary group were worse off in this case. Similarly, around half of the current beneficiary households reported that foods were sometimes deficit 5 years ago and 36.82% of former beneficiary households reported the similar way. Around 8% of both current and former beneficiary groups, however, reported that the foods were neither deficit nor surplus.

Table 5.17: Present Economic Condition of SWANO Beneficiary Households

Subjective Wellbeing Indicators	Current beneficiary	Former beneficiary
Very poor	15	22
	3.43	5.47
Poor	327	304
	74.83	75.62
Lower middle class	81	63
	18.54	15.67
Middle class	14	13
	3.20	3.23
Total	437	402
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 5.17 represents the present's economic condition of both current beneficiary and former beneficiary households. Overall, both former and current beneficiary groups are poor or very poor that means around 80% of current and former beneficiary households think they are either poor or very poor, yet the percentage of very poor level is very low. On the contrary, very few people from both current beneficiary (3.20%) and former beneficiary group (3.23 %) think they are from middle class. Additionally, 18.54% of current beneficiary and more than 15% of former beneficiary think they belong lower middle class.

Table 5.18: Previous (5 years ago) Economic Condition of the SWANO Beneficiary Households

	Current beneficiary	Former beneficiary
Very poor	307	302
	70.25	75.12
Poor	114	92
	26.09	22.89
Lower middle class	15	8
	3.43	1.99
Middle class	1	0
	0.23	0.00

Total	437	402
	100.00	100.00

Note: First row has *frequencies* and second row has *column percentages*.

Table 5.18 represents the economic condition of current beneficiary and former beneficiary group of 5 years ago. In both cases nearly 95% of all people were either poor or very poor. Thus, very few people from current beneficiary are from lower middle class (3.43%) and l% current beneficiary are from middle class but there is no former beneficiary from middle class. In terms of economic condition, both current beneficiary and former beneficiary households have improved in the last 5 years.

5.5 Ordinary Least Square (OLS) Regression Results

Table 5.19 delineates the regression results on income per capita, expenditure per capita and asset per capita among current beneficiary (second cycle) and former beneficiary (first cycle) households of the SWAPNO project. It is seen that, current beneficiaries are better off in all the categories- income, expenditure and asset. Controlling for previous asset, past food condition, aspirations, regions and other household characteristics, current beneficiary households, on an average, have 1500 BDT higher monthly income, 500 BDT higher monthly expenditure and 5,600 BDT higher asset than the former beneficiary households who were in the previous SWAPNO project.

Table 5.19: Correlates of Household Income, Expenditure and Asset

VARIABLES	Income PC	Expenditure PC	Asset PC
Beneficiary dummy (current beneficiary=1)	1534.0***	510.3***	5542.3***
	(-4.00)	(-3.92)	(-5.06)
Age of HH head	94.32***	24.02*	35.8
	-4.06	-1.97	-0.51
Marriage before age 15 (yes=1)	-511	254.7	891.3
	(-1.54)	-1.17	-0.81
Literacy dummy (can sign or read/write letter)	-292	180.1	-916.4
	(-0.28)	-0.7	(-0.31)
Married dummy(yes=1)	320.9	-69.77	2006.7
	-0.55	(-0.52)	-1.51
Previous asset pc	0.107***	0.0166*	0.842***
	-3.71	-2.55	-7.53
Phone dummy (yes=1)	361.3	-72.55	1190.1
	(-0.97)	(-0.26)	-0.93
Using MFS (yes=1)	-131.2	-333.7	1231.5

VARIABLES	Income PC	Expenditure PC	Asset PC
	(-0.19)	(-0.77)	-0.75
Having MFS account (yes=1)	95.08	444.9	134.4
	-0.15	-0.93	-0.09
Aspiration about self (base: not at all optimistic)			
1. Slightly optimistic	2644.5*	-2149	-1865.6
	-2.46	(-0.87)	(-0.54)
2. Optimistic	3405.2**	-2565.8	-1500.7
	-2.69	(-1.02)	(-0.44)
3. Very optimistic	3256.5*	-2674.9	53.72
	-2.48	(-1.08)	-0.01
Aspiration about children (base: not at all optimistic)			
1. Slightly optimistic	-3775.5	387.8	6709.4**
	(-0.78)	-0.37	-3.14
2. Optimistic	-3889.8	1128.9	9230.5***
	(-0.79)	-0.91	-4.49
3. Very optimistic	-3820.9	1323.9	9388.0***
	(-0.77)	-1.07	-4.15
4. Not applicable	-2058	2162.4	12642.3***
	(-0.42)	-1.56	-4.84
Food condition 5 years ago (base: always deficit)			
1. Sometime deficit	-142.6	41.61	535.4
	(-0.44)	-0.22	-0.46
2. Enough	-196.4	647.9	624.5
	(-0.36)	-1.16	-0.26
3. Surplus	1740.3	476.7	-4957.4
	-0.63	-0.89	(-1.52)
HH Size AE	-1281.3***	-482.9***	-3385.8***
	(-6.13)	(-8.01)	(-5.52)
Having combined shock (yes=1)	-1432.1***	278.7	-1407
	(-3.92)	-1.35	(-1.12)
Having individual shock (yes=1)	-158.8	137.6	-2532.1*
	(-0.42)	-0.79	(-2.05)
Upazilla (base category: Bhurunganmari)			
1. Char Rajibpur	-886.9	-1587.8**	-192.3
	(-0.99)	(-2.98)	(-0.06)
2. Chilmari	-882.9	-1555.6*	1115.6
	(-1.13)	(-2.50)	-0.37
3. Kurigram Sadar	-1314.2	-1062.5*	-2764.2
	(-1.54)	(-1.98)	(-0.92)
4. Nagesshori	157.8	-778.3	-2387
	-0.18	(-1.15)	(-0.96)
5. Fulbari	-736.6	-238.5	-4533.3
	(-0.87)	(-0.29)	(-1.65)
6. Rajarhat	-2088.5**	-284.1	96.38
	(-3.00)	(-0.43)	-0.03
7. Rowmari	-1959.9**	-76.85	-3409.2
	(-3.04)	(-0.07)	(-0.97)

VARIABLES	Income PC	Expenditure PC	Asset PC
8. Ulipur	-391.3	-1452.5*	3027.3
	(-0.52)	(-2.36)	-0.98
9. Assasuni	-1662.5*	-692.1	4777.7
	(-2.30)	(-0.99)	-1.5
10. Debhata	-1303.4	-323.3	-1134
	(-1.86)	(-0.56)	(-0.43)
11. Kaligonj	-901.3	-323.8	-3969.2
	(-1.21)	(-0.44)	(-1.71)
12. Shemnagar	-838.4	-154.8	-3677.2
	(-0.80)	(-0.25)	(-1.20)
13. Tala	-1952.9**	-632.4	16.85
	(-3.16)	(-1.03)	-0.01
Constant	6109	3429.3	6326.3
	-1.32	-1.96	-1.08
Observations	839	839	839
R-squared	0.294	0.164	0.451

Among the other household characteristics, age of the household head has significant positive association with income and expenditure, value of the previous household asset has significant positive association with income, expenditure and asset, some aspirations have significant positive association with income, and asset, both individual shocks and combined shocks have some negative associations with income and asset.

Household size has significant negative associations with income, expenditure and asset. Everything's remaining constant, a member increase in household is associated with 1300 BDT decrease in income, 500 BDT decrease in expenditure and 3300 BDT decrease in current asset. Marital status has positive but not significant association with income and asset.

In summary, controlling for household and regional characteristics, current beneficiary households are better in all indicators like income, expenditure and asset than the former beneficiary households.

5.6 Propensity Score Matching (PSM) Regression Results

The results of PSM model also tell the same story. The core logistic model estimated for assessing the probability of participation and generate propensity score between the former and the current beneficiary is presented in Table 5.21. In addition, we also generate the propensity score between the former beneficiaries and the control group using the logistic model presented in Table 5.22. The PSM results are summarized in Table 5.20.

Three points are noteworthy. First, both OLS and PSM results suggest that the economic well-being measures—in respect of income per capita and non-land asset per capita—are higher for the current beneficiaries compared to the former beneficiaries, suggesting a clear sign of slow-down, as the years passed by after the graduation from the project (see also, Box 4). The difference is not significant in respect of consumption expenditure according to the more reliable PSM model. Second, even after the decline, the former beneficiaries are still much better off than the control group households. This is depicted in income and asset per capita measures. The difference in respect of consumption expenditure per capita is, however, not significant even at 10% level. The broad point to note is that project effects were still considerable even after 3 years, but there are signs of slow-down after graduation from the project. This may indicate that the SWAPNO project should pay attention to the former beneficiaries in terms of "second-chance" initiatives for the not-so-successful cases, more intensive nursing and hand-holding in terms of choice of business projects, entrepreneurship development, and marketing facilities.

Table 5.20: Absolute Difference between Current Beneficiaries and Former Beneficiaries: Welfare Comparisons by Cross-Sectional OLS and PSM Methods

Indicators	OLS (Current vs. Former)	PSM (Current vs. Former)	PSM (Former vs. Control)
Per Capita Monthly Income	1534***	1907***	1767***
Per Capita Monthly Expenditure	510***	221	314
Per Capita Current Asset	5542***	6167***	6006***

Note: The figures represent absolute difference in current BDT.

Table 5.21: Logistic Regression used for the Propensity Score Model: Comparison between Former Beneficiary and Current Beneficiary

Former Beneficiary (1) vs. Current Beneficiary (0)	Coefficient	Z
Age of HH head	-.0570924	-0.72
Age Squared	.0012298	1.27
Marriage after age 15 (yes=1)	.1552683	0.92
Female headed household (yes=1)	-.0175344	-0.04
Household having any child below 6 years (yes=1)	-.4391532	-1.49
Household having elderly above age 60 (yes=1)	.0427984	0.19
Marital Status (Married=reference category)		
Divorced	-.1719871	-0.53
Abandoned	-.0383312	-0.12
Widow	.1129201	0.39
Education of HH head ('no formal education'=reference category)		
Below Primary	.1533907	0.58
Primary	.2804182	0.60
Below SSC	.1472454	0.32
SSC and above	.7248726	0.87
Literacy ('cannot sign'==reference category)		
Can only sign	.206235	0.46
Can read and write	-.0717687	-0.13
Whether Main Earner (yes=1)	-.2750596	-1.02
Previous asset per capita	.0000353	4.33
Mobile Phone dummy (yes=1)	-.3460277	-1.73
Household size	.1534643	1.93
Having combined shock (yes=1)	.5061426	2.52
Having individual shock (yes=1)	.2653724	1.54
Pseudo R2	0.1077	
Number of Observations	831	

Note: The model also controls for upazilla level fixed effects.

Table 5.22: Logistic Regression used for the Propensity Score Model: Comparison between Former Beneficiary and Control Households

Former Beneficiary (1) vs. Control (0)	Coefficient	Z
Age of HH head	-.0182522	-0.27
Age Squared	.000564	0.73
Marriage after age 15 (yes=1)	-.0429809	-0.23
Female headed household (yes=1)	.7630374	1.90
Household having any child below 6 years (yes=1)	-.6490795	-2.08
Household having elderly above age 60 (yes=1)	-.0746845	-0.30
Marital Status (Married=reference category)		
Divorced	.456558	1.32
Abandoned	.0367971	0.12
Widow	.6417543	2.15
Education of HH head ('no formal education'=reference category)		
Below Primary	.1242883	0.43
Primary	.0287648	0.06
Below SSC	.1894097	0.39
SSC and above	.3998042	0.45
Literacy ('cannot sign'==reference category)		
Can only sign	.8345451	2.29
Can read and write	.5947727	1.14
Whether Main Earner (yes=1)	.2655276	1.00
Previous asset per capita	.0001113	7.30
Mobile Phone dummy (yes=1)	.6114891	2.98
Household size	.1071215	1.21
Having combined shock (yes=1)	-.4112642	-2.06
Having individual shock (yes=1)	.1584804	0.85
Pseudo R2	0.1989	
Number of Observations	758	

Note: The model also controls for upazilla level fixed effects.

Box 4: Why some of the Current as well as Former Beneficiaries have Not Done Better[16]

- Initial debt mattered: loans which the beneficiaries took before participating in the SWAPNO project became a drag on them as they had to pay back the loan amount from the transfer income
- Health shock is one of the most important factors that did not allow the beneficiaries to invest in the income generating activities
- Some of the beneficiaries did not own any land at all to undertake IGAs such as homestead gardening, poultry or fishery
- Dowry has been a dragging factor: high rate of dowry for daughter's marriage eroded the bulk of the savings
- Some were not able to recover money from others (when items were sold on credit), as a result they did not have enough money to invest
- Some spent the bulk of the additional income/ savings on consumer goods and/ or improving the condition of housing
- Natural shocks (e.g. flood) have adversely affected income-earning potential of some of the beneficiaries
- Having initial bigger household size is also an important factor that increased the burden on the expenditure side due to higher food spending

[16] Evidence from FGDs, KIIs and Life Story Interviews

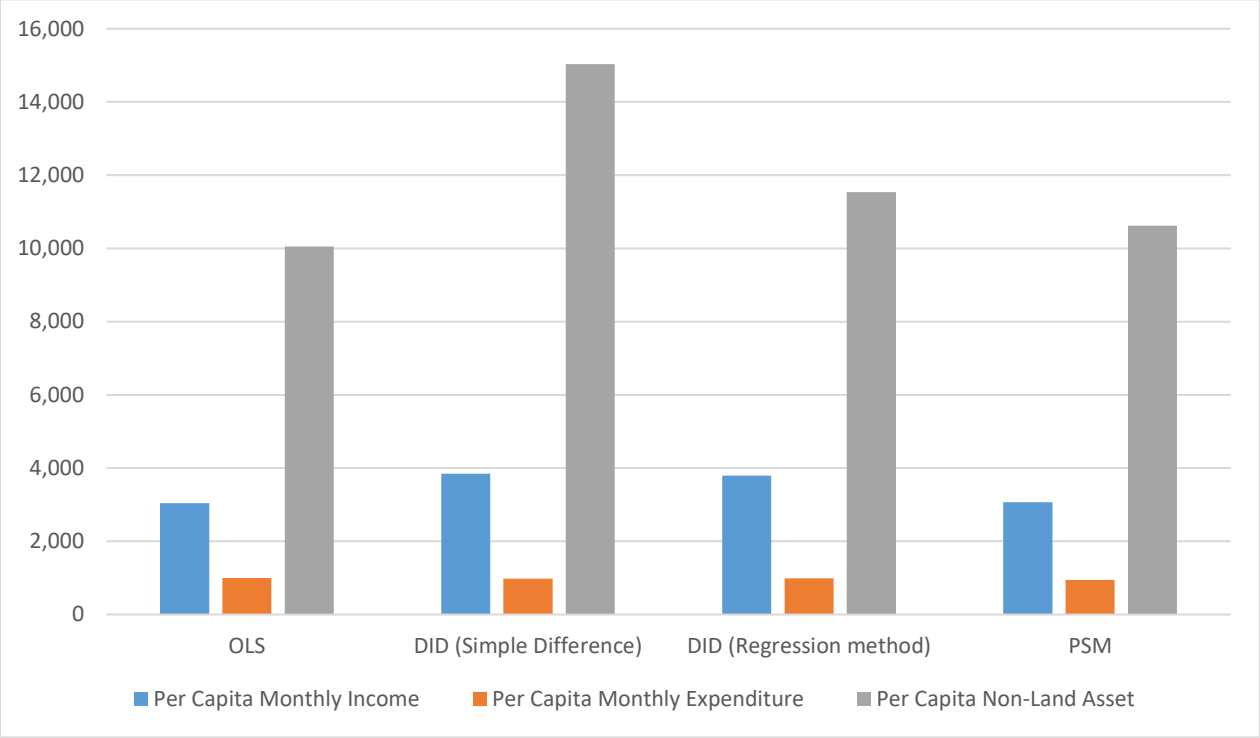
Chapter 6: Summary and Policy Implications

6.1 Main Conclusions

Five main conclusions emerge from the preceding analysis. First, in respect of all major indicators of economic wellbeing, the SWAPNO beneficiaries graduating from the current cycle of 2017-19 outperformed the control group households. We focused on income per capita, consumption expenditure per capita and non-assets per capita as three key economic indicators determining long-term income growth and economic well-being. This conclusion is upheld by all methods: simple OLD exploring the observed current differences in welfare, Propensity Score Matching (PSM) and the Difference-in-Difference (DID) methods. According to the PSM method, current beneficiaries have an edge of BDT 3070 in respect of per capita income compared to their counterparts in the control group; the matched difference according to the DID method is even higher—BDT 3793. In short, current beneficiaries, on average, have *78% higher per capita income than the control group (as per PSM), and 96% higher per capita income than the control group (as per DID)*. The difference in respect of per capita consumption expenditure is understandably less (because of the heightened emphasis on savings in beneficiary households) but still considerable. The project participants have, on average, *have 58% higher per capita consumption expenditure than the control group (as per DID) and 55% higher per capita consumption expenditure than the control group (as per PSM)*. The most striking difference is observed in terms of capital accumulation. Both the PSM and DID methods indicate that the treatment group has more than 2 times higher non-land assets than that observed for the control group (see, Figure 3).

The project participants seem to be committed accumulators overcoming the psychological trap of procrastination and lack of self-control: only 20% of their non-land assets are represented by consumer durables; in contrast, 65% of their non-land assets are productive assets, and 15% are saved as financial assets for future use. These economic results are truly celebratory especially if we recall the difficult socio-economic contexts in which the project was implemented: these areas are generally marked by *weak markets* (as in Kurigram) and *weak institutions* (as in Satkhira and Kurigram).

Figure 6.1: Absolute Difference between Current Beneficiaries and Control Groups



Second, the above results were achieved *over a span of 18 months*. This gives an indication that the Mini Big-Push strategy can work: it can remove the heavy burden of extreme poverty within the shortest possible time. We have seen the value of the package involved in the Mini Big-Push is considerably higher than that observed for the conventional social protection projects. The SWAPNO assistance package per beneficiary translates into BDT 4850 per month compared to BDT 900 per month per beneficiary for VGD and 500 per month for the Widow Scheme. Is such transfer defendable? Recall the total transfer/ investment per beneficiary over the 18-moth cycle from SWAPNO is BDT 87,300. If the non-land asset accumulation over the 18-moth cycle is BDT 11,541 per beneficiary and per capita income increase is BDT 3793 (as per the DID method), then the total monetary benefits turn out to be BDT 15,334. From this, one can estimate the "return to SWAPNO investment" to be in the order of 17.6% i.e. justifiable in economic terms. This is, of course, the lower bound value, as monetary benefits are calculated on *per capita basis* and transfer is calculated on *per beneficiary basis*. Correcting for this, we can see the return to SWAPNO investment could be as high as 43.6%.

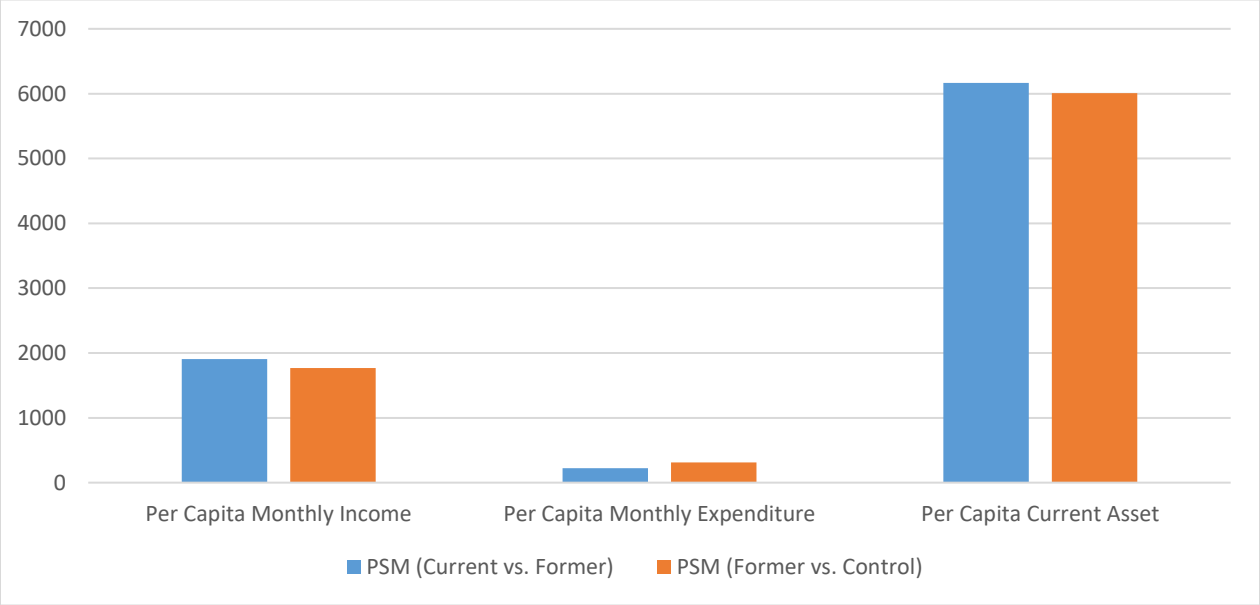
Third, benefits from the SWAPNO project are not just noticeable in terms of major economic indicators but also reflected in terms of dietary diversity and "subjective measures" of well-being. Among the current beneficiary households, 64.5 percent have median or above bear dietary diversity, which is nearly twice more than the current control group (32.35%) indicating significantly higher dietary diversity for beneficiary households. Among the beneficiary households, 54% women attained median and above dietary diversity, while it is 43% for the control households. In terms of subjective food-poverty, only 7% of the project participants in the current cycle report food-deficit compared to 59% for the non-participants. They also tend to be more ambitious marked with higher aspiration for themselves (74% as against 38%) and for their children (68% vs. 51%).

Fourth, only a small fraction of both the beneficiary and control households have under-five children (109 children in total were originally listed in the baseline survey and 67 in the endline survey). It will require a much bigger sample to generate representative estimates for child under-nutrition. For what is it is worth, our survey shows a much lower prevalence of underweight children in the treatment group (37% as against 51%). The same trends emerge in case of child stunting rate. Much complex picture emerges with respect to adult anthropometry. Although income measures, food intake, and dietary diversity have improved considerably in the group of current beneficiaries, BMI status for adult female members have not improved or improved little compared to their counterparts in the control group, at least during the tenure of the project cycle. Moreover, it seems that the current beneficiary households are suffering from the "double-burden of malnutrition": the BMI distribution for adult females has a bi-polar BMI distribution, having more "severely underweight" and "more overweight" at the same time. Consequently, the issue of adult anthropometry needs to be paid more attention in SWAPNO projects, as no clear-cut advantage is discernible in current vs. control, or former vs. current beneficiary comparisons.

Fifth, the economic situation of the former beneficiaries has remained better compared to the control group households even after graduation from the project and this is reassuring about the positive benefits of SWAPNO project. However, there is a sign of visible slow-down in the economic fortunes of the former beneficiaries when they are compared to the current beneficiaries. The relative decline is recorded in all three economic measures—income, consumption spending, and non-land assets (Figure 4). This is also evident when other subjective measures of well-being are considered. Such setbacks are to be expected in escaping poverty. The important consideration

is the ability to bounce back when the chips are down. It is possible that the former beneficiaries are actually able to recover from these setbacks. In that case, such slippages will be temporary. This warrants paying greater focus on the *resilience* aspects when designing anti-poverty projects. This is an issue to which more attention needs to be paid on the part of SWAPNO project.

Figure 6.2: Absolute Difference between Current Beneficiaries and Former Beneficiaries



6.2 Policy Implications

Several points are noteworthy. First, there are issues of *project delivery* that needs to be re-visited. For instance, a recurring observation emerging from the FGDs is the factor of institutional delays on disbursing wage income—due to bureaucratic hassles—which often increase beneficiary indebtedness and even result in incurring higher costs of food and non-food household expenditure items. However, this issue merits greater examination. If the concern is true, then one way-out could be to arrange interim financing from the partner NGOs or any other third source of institutional finance to make wage funds readily available. A counter-argument is that partner NGOs may be constrained by financial resources. In view of this, it is important to ensure that all cash transfer commitments to the recipients must be institutionally available at the outset.

Second, there are issues relating to "second-chance" and more "intensive monitoring" that are required to make not-so-successful project participants viable over time. This may include more hand-holding of the less entrepreneurial sections of the poorest women by way of extra-doses of livelihood training, skill formation, job search and confidence-building measures.

Third, individual shocks seem to be an important driver of relative under-performance and decline over time, as emerging from the econometric results. Shocks seem to be an important explanatory factor for understanding economic outcomes--especially true in case of former beneficiaries as compared to the current beneficiaries. Some institutional mechanism for ensuring health insurance may need to be developed by the SWAPNO project to prevent fall into poverty.

Fourth, the SWAPNO project shows that, with injection of *threshold amount* of external resources, the persistent poverty trap syndrome can be overcome. This is in contrast to the tokenism that characterizes the conventional social protection projects. While this is a big success for the SWAPNO type of Mini Big-Push intervention, the issue of sustainability of the project impact has not been settled for good. The changing economic fortunes of the former beneficiaries is a case in point: they need to get some attention from the SWAPNO project to ensure long-term graduation from the poverty trap by enhancing their resilience capacity to bounce back when setbacks occur (they are bound to occur).

Fifth, one needs to ask as well about the optimal use of SWAPNO resources, i.e., whether the same project effects could have been generated with lower costs under alternative assistance packages. The current monthly transfer amount may be deemed too high (higher than the threshold amount) or just about right (closer to the threshold amount) depending on the argument. *This debate cannot be resolved without experimenting with varying assistance packages*, again in the spirit of randomized control trial (RCT), elements of which SWAPNO has been already practicing. In addition, what is need now could be tracer studies to capture long-term impact and resilience capacity in the face of inevitable shocks. This spirit can be explicitly factored in the project design in the upcoming pilots to be implemented in Jamalpur, Gaibandha, and Lalmonirhat. Such an experimental approach will be critical for much needed buy-in and also for deciding the future shape of the SWAPNO project.

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Annex Tables

Table A.1: Income, Expenditure and Non-Land Asset of the Households: Kurigram

Type		Income PC	Expenditure PC	Asset PC
Current beneficiary	Mean	7555.5	2628.6	20061.0
	SD	4356.6	3188.0	21391.4
Current control	Mean	3742.3	1561.7	4102.1
	SD	2496.3	843.0	5266.1
Former beneficiary	Mean	6764.9	2346.2	17063.3
	SD	5520.1	3845.3	16558.4
All	Mean	6106.9	2204.4	14094.0
	SD	4597.2	2963.4	17668.2

Table A.2: Income, Expenditure and Non-Land Asset of the Households: Satkhira

Type		Income PC	Expenditure PC	Asset PC
Current beneficiary	Mean	7608.1	2842.3	19029.3
	SD	3742.3	1673.1	18003.2
Current control	Mean	4180.2	1879.1	6827.1
	SD	3070.4	1003.7	9205.8
Former beneficiary	Mean	6119.0	2378.2	17548.3
	SD	6089.6	1502.2	19786.6
All	Mean	6047.8	2387.4	14849.3
	SD	4769.2	1486.3	17427.6

Table A.3: Median HDDS and Women DDS of the Households: Kurigram

	HDDS	Women DDS
Current beneficiary	9	8
Current control	8	7
Former beneficiary	9	8

Table A.4: Median HDDS and Women DDS of the Households: Satkhira

	HDDS	Women DDS
Current beneficiary	9	8
Current control	8	7
Former beneficiary	9	8

Table A.5: Proportion of Households Having Median and above HDDS: Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
No	85	154	87	326
	33.73	72.64	42.03	48.58
Yes	167	58	120	345
	66.27	27.36	57.97	51.42
Total	252	212	207	671
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.6*:* Proportion of Households Having Median and above HDDS: Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
No	70	99	88	257
	37.84	61.11	45.13	47.42
Yes	115	63	107	285
	62.16	38.89	54.87	52.58
Total	185	162	195	542
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.7: Proportion of Households Having Median and above Women DDS: Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
No	112	123	86	321
	46.47	60.89	45.03	50.63
Yes	129	79	105	313
	53.53	39.11	54.97	49.37
Total	241	202	191	634
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.8:: Proportion of Households Having Median and above Women DDS: Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
No	84	82	85	251
	45.41	52.23	46.70	47.90
Yes	101	75	97	273
	54.59	47.77	53.30	52.10
Total	185	157	182	524
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.9: Household Food Insecurity Access Scale (HFIAS): Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
Food Secure Access	210	57	161	428
	83.33	26.89	77.78	63.79
Mildly Food Insecure Access	24	60	33	117
	9.52	28.30	15.94	17.44
Moderately Food Insecure Access	17	79	13	109
	6.75	37.26	6.28	16.24
Severely Food Insecure Access	1	16	0	17
	0.40	7.55	0.00	2.53
Total	252	212	207	671
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.10: Household Food Insecurity Access Scale (HFIAS): Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
Food Secure Access	144	62	137	343
	77.84	38.27	70.26	63.28
Mildly Food Insecure Access	32	35	41	108
	17.30	21.60	21.03	19.93
Moderately Food Insecure Access	8	51	11	70
	4.32	31.48	5.64	12.92
Severely Food Insecure Access	1	14	6	21
	0.54	8.64	3.08	3.87
Total	185	162	195	542
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.11: Aspiration about the Future: Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
Not at all optimistic	2	33	7	42
	0.79	15.57	3.38	6.26
Slightly optimistic	65	99	71	235
	25.79	46.70	34.30	35.02
Optimistic	163	73	109	345
	64.68	34.43	52.66	51.42
Very optimistic	22	7	20	49
	8.73	3.30	9.66	7.30
Total	252	212	207	671
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.12: Aspiration about the Future: Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
Not at all optimistic	4	23	6	33
	2.16	14.20	3.08	6.09
Slightly optimistic	44	76	44	164
	23.78	46.91	22.56	30.26
Optimistic	102	54	124	280
	55.14	33.33	63.59	51.66
Very optimistic	35	9	21	65
	18.92	5.56	10.77	11.99
Total	185	162	195	542
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.13: Aspiration about Children's Future: Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
Not at all optimistic	0	7	0	7
	0.00	3.32	0.00	1.05
Slightly optimistic	40	65	41	146
	15.94	30.81	19.81	21.82
Optimistic	86	67	81	234
	34.26	31.75	39.13	34.98
Very optimistic	80	42	44	166
	31.87	19.91	21.26	24.81
Not applicable	45	30	41	116
	17.93	14.22	19.81	17.34
Total	251	211	207	669
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.14: Aspiration about Children's Future: Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
Not at all optimistic	4	5	3	12
	2.19	3.11	1.55	2.23
Slightly optimistic	26	47	26	99
	14.21	29.19	13.47	18.44
Optimistic	46	46	64	156
	25.14	28.57	33.16	29.05
Very optimistic	81	35	75	191
	44.26	21.74	38.86	35.57
Not applicable	26	28	25	79
	14.21	17.39	12.95	14.71
Total	183	161	193	537
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.15: Present Food Condition of the Households: Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
Always deficit	3	18	0	21
	1.19	8.49	0.00	3.13
Sometimes deficit	16	119	25	160
	6.35	56.13	12.08	23.85
Neither deficit nor surplus	97	59	90	246
	38.49	27.83	43.48	36.66
Surplus	136	16	92	244
	53.97	7.55	44.44	36.36
Total	252	212	207	671
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.16: Present Food Condition of the Households: Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
Always deficit	0	11	2	13
	0.00	6.79	1.03	2.40
Sometimes deficit	14	74	25	113
	7.57	45.68	12.82	20.85
Neither deficit nor surplus	82	67	99	248
	44.32	41.36	50.77	45.76
Surplus	89	10	69	168
	48.11	6.17	35.38	31.00
Total	185	162	195	542
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.17: Previous (5 Years Ago) Food Condition of the Households: Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
Always deficit	117	114	130	361
	46.43	53.77	62.80	53.80
Sometimes deficit	118	72	61	251
	46.83	33.96	29.47	37.41
Neither deficit nor surplus	17	26	15	58
	6.75	12.26	7.25	8.64
Surplus	0	0	1	1
	0.00	0.00	0.48	0.15
Total	252	212	207	671
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.18: Previous (5 Years Ago) Food Condition of the Households: Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
Always deficit	62	69	88	219
	33.51	42.59	45.13	40.41
Sometimes deficit	96	53	87	236
	51.89	32.72	44.62	43.54
Neither deficit nor surplus	18	31	18	67
	9.73	19.14	9.23	12.36
Surplus	9	9	2	20
	4.86	5.56	1.03	3.69
Total	185	162	195	542
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.19: Current Economic Condition of the Households: Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
Very poor	11	80	14	105
	4.37	37.74	6.76	15.65
Poor	196	110	174	480
	77.78	51.89	84.06	71.54
Lower middle class	42	21	19	82
	16.67	9.91	9.18	12.22
Middle class	3	1	0	4
	1.19	0.47	0.00	0.60
Total	252	212	207	671
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.20: Current Economic Condition of the Households: Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
Very poor	4	49	8	61
	2.16	30.25	4.10	11.25
Poor	131	84	130	345
	70.81	51.85	66.67	63.65
Lower middle class	39	22	44	105
	21.08	13.58	22.56	19.37
Middle class	11	7	13	31
	5.95	4.32	6.67	5.72
Total	185	162	195	542
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.21: Table A21: Economic Condition of 5 Years Ago: Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
Very poor	187	141	166	494
	74.21	66.51	80.19	73.62
Poor	61	65	41	167
	24.21	30.66	19.81	24.89
Lower middle class	4	6	0	10
	1.59	2.83	0.00	1.49
Total	252	212	207	671
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.22: Economic Condition of 5 Years Ago: Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
Very poor	120	93	136	349
	64.86	57.41	69.74	64.39
Poor	53	53	51	157
	28.65	32.72	26.15	28.97
Lower middle class	11	14	8	33
	5.95	8.64	4.10	6.09
Middle class	1	2	0	3
	0.54	1.23	0.00	0.55
Total	185	162	195	542
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.23: Number and Percentage of Stunted Children (Below 5): Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
No	13	14	7	34
	65.00	66.67	77.78	68.00
Yes	7	7	2	16
	35.00	33.33	22.22	32.00
Total	20	21	9	50
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A24: Number and Percentage of Stunted Children (Below 5): Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
No	8	9	4	21
	80.00	56.25	57.14	63.64
Yes	2	7	3	12
	20.00	43.75	42.86	36.36
Total	10	16	7	33
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.24: Number and Percentage of Underweight Children (Below 5): Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
No	13	12	3	28
	65.00	57.14	33.33	56.00
Yes	7	9	6	22
	35.00	42.86	66.67	44.00
Total	20	21	9	50
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.25: Number and Percentage of Underweight Children (Below 5): Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
No	6	6	6	18
	60.00	37.50	85.71	54.55
Yes	4	10	1	15
	40.00	62.50	14.29	45.45
Total	10	16	7	33
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.26: Number and Percentage of Wasted Children (Below 5): Kurigram

	Current beneficiary	Current control	Former beneficiary	Total
No	14	12	3	29
	70.00	66.67	37.50	63.04
Yes	6	6	5	17
	30.00	33.33	62.50	36.96
Total	20	18	8	46
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.27: Number and Percentage of Wasted Children (Below 5): Satkhira

	Current beneficiary	Current control	Former beneficiary	Total
No	5	11	5	21
	55.56	73.33	71.43	67.74
Yes	4	4	2	10
	44.44	26.67	28.57	32.26
Total	9	15	7	31
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.28: Body Mass Index (BMI) of the Adults: Kurigram

.	Current beneficiary	Current Control	Former beneficiary	Total
Severe underweight	73	70	48	191
	11.59	11.55	9.02	10.80
Underweight	63	65	81	209
	10.00	10.73	15.23	11.82
Normal weight	296	263	226	785
	46.98	43.40	42.48	44.40
Overweight	50	35	27	112
	7.94	5.78	5.08	6.33
Obesity	148	173	150	471
	23.49	28.55	28.20	26.64
Total	630	606	532	1768
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*

Table A.29: Body Mass Index (BMI) of the Adults: Satkhira

	Current beneficiary	Current Control	Former beneficiary	Total
Severe underweight	55	66	47	168
	12.22	14.57	9.36	11.96
Underweight	61	47	68	176
	13.56	10.38	13.55	12.53
Normal weight	158	175	198	531
	35.11	38.63	39.44	37.79
Overweight	50	48	51	149
	11.11	10.60	10.16	10.60
Obesity	126	117	138	381
	28.00	25.83	27.49	27.12
Total	450	453	502	1405
	100.00	100.00	100.00	100.00

First row has *frequencies* and second row has *column percentages*