



Research Report

No. 49 ■ April 2017

The Impact of Skills Development
Initiatives for Adolescents on Climate
Adaptive Livelihoods in Southwestern
Bangladesh

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April 2017

BRAC Research and Evaluation Division

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April 2017

Copy editing, printing and publication
Altamas Pasha

Cover and Layout design
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Published by

BRAC Research and Evaluation Division
BRAC Centre | 75 Mohakhali | Dhaka 1212, Bangladesh

Tel: (88-02) 9881265, 9846448, 9844180-7
Fax: (88-02) 9843614 | Web: www.research.brac.net

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Printed by
Zaman Printing and Packaging | 41-42 Islampur Road, Dhaka 1100

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ACRONYMS

ADP	Adolescent Development Programme
AFSP	Agriculture and Food Security Programme
ANCOVA	Analysis of Covariance
BALIKA	Bangladeshi Association for Life Skills, Income, and Knowledge for Adolescents
BLD	BRAC Learning Division
CF	Compost Fertiliser
DiD	Difference-in-difference
DOL	Department of Labor
ELA	Empowerment and Livelihood for Adolescent
FF	Fish Feed
FGD	Focused Group Discussion
GATE	Growing America through Entrepreneurship
IDI	In-depth Interview
IGA	Income Generating Activity
IPCC	Intergovernmental Panel on Climate Change
ITT	Intention-to-treat
KII	Key Informant Interview
OFSP	Orange-fleshed Sweet Potato
OLS	Ordinary Least Squares
PCAT	Promoting Climate Adaptive Technology
PRA	Participatory Rural Appraisal
RCT	Randomised Controlled Trial
RM	Regional Manager
SDIA	Skills Development Initiatives for Adolescents
STEP	Skills and Training Enhancement Project
UNFPA	United Nations Population Fund

ACKNOWLEDGEMENTS

We would like to cordially acknowledge Advocacy for Social Change (ASC) Programme for financing this research study. Also, we want to acknowledge Agriculture and Food Security Programme (AFSP), BRAC Learning Division (BLD) and Adolescent Development Programme (ADP) for their time allocation for meetings and series of electronic communication. We offer our sincere gratitude to Prof. Abdul Bayes, Director BRAC Research and Evaluation Division for supporting this study. We are very much thankful to Mr Narayan C Das, Senior Research Fellow and Coordinator, Development Economics Research unit of RED for supervising the report writing. We would also like to express our cordial thanks to Anindita Bhattacharjee, Senior Research Associate for her insightful review and invaluable comments to improve the content of this report. It would be difficult to complete the study without the help of Administration unit, Field Management unit, Data Management unit and fellow colleagues of different research units. We acknowledge our gratitude to them. Special thanks go to Mr Altamas Pasha for copy editing and final proof reading of the manuscript. Mr Md Abdur Razzaque also deserves thanks for formatting the report. The authors are also indebted to Dr Md Sirajul Islam, Programme Head, Agriculture and Food Security Programme of BRAC for reviewing the report. Finally, we would like to say thanks to our field staffs of ADP for helping in different aspects of this research and to our enumerators for data collection. We are very much indebted to our respondents who gave us all valuable information by sacrificing their time.

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EXECUTIVE SUMMARY

Nearly 23 per cent of Bangladesh's total population is aged between 10 and 19. This large population group is termed as adolescent and considered the most potential source of country's future labour force. However, a larger portion of them has limited scope for acquiring knowledge and skills for self-development and participate in income generating activities. Particularly, in south-western region of Bangladesh adolescents are much more disadvantaged in this regard as there agricultural based livelihood system has been shifted from traditional paddy cultivation to aquaculture and homestead based small scale agricultural activities due to the erroneous effects of climate change. Considering the present context, BRAC has implemented a pilot project titled 'Skills Development Initiatives for Adolescents (SDIA) on climate adaptive livelihoods' in two districts of south-western Bangladesh to promote some agricultural technologies among the adolescents so that they can develop their skills and engage in income generating activities (IGAs).

Under this project, 100 adolescent members from different BRAC adolescent clubs were trained on three agricultural technologies namely fish feed production (FF), compost fertiliser preparation (CF), and orange fleshed sweet potato cultivation (OFSP). It is believed that these skills would be helpful to develop climate adaptive livelihoods among the adolescents in this region. Fish feed is necessary to cultivate shrimp and prawn in south-western region. Additionally, market demand for fish feed has been increasing rapidly there. Compost fertiliser is effective to reduce dire impacts of salinity to produce vegetables in homestead gardens in this climate affected region. There is also a growing market for such natural manure. Again, in this region, households' dietary diversifications are considerably lower and suffer from poor nutritious food supplies in their diets. Cultivating OFSP can help adolescent households to improve dietary diversification and nutrition level in this area. It could also be sold in the local market if adolescents cultivate it commercially.

BRAC has been expected that the training on over mentioned climate adaptive agricultural technologies would potentially help the adolescents to acquire some knowledge and develop their skills to participate in IGAs in the changed livelihood system at climate affected south-western region. However, available literature does

not provide adequate information about the effectiveness of such training programme on adolescent. Moreover, BRAC has no earlier experiences related to such activities as well. So, it is important to evaluate the effectiveness of such activities prior to scale it up. Therefore, this study evaluated the impact of this pilot project to comprehend the effectiveness of such activity in promoting climate adaptive technologies among the adolescents. Present study is aimed at answering following four research questions:

1. What are the perceptions about the training and technologies?
2. What is the impact of skills development training on knowledge, entrepreneurial attitude, future aspiration and practice in relation to specific IGAs for the adolescents?
3. Are the adolescents able to initiate some IGAs and make some additional income for the households?
4. How participation in the intervention change adolescents' intra-household decision-making power?

To evaluate the impact of SDIA this study followed quantitative driven mixed methods adopting 'concurrent procedure'. The quantitative method evaluated the impact by estimating counterfactuals. On the other hand, case study and livelihood trajectory methods were followed to qualitatively explore the context and process of the impacts. To estimate counterfactuals a clustered randomised control trial (RCT) was followed. Clustering at club level was followed to avoid potential contamination.

Both pre and post intervention quantitative data were collected in the present study using questionnaire interview. Pre-intervention data were collected in March, 2016 and post-intervention data were collected in May, 2016. Focused Group discussion (FGDs), In-depth Interview (IDIs), Key Informant Interview (KIIs), and informal discussions were employed to collect qualitative data from the participant adolescents at post-intervention period. Respondents were selected purposively following maximum variation sampling technique.

Analysis of Covariance (ANCOVA) technique was used to estimate the impact coefficients from quantitative data as autocorrelation in outcome variables were significantly lower. Moreover, simple Ordinary Least Squares (OLS) using post-intervention data, and (Different-in difference (DiD) with and without fixed-effect regressions using the panel data were estimated to check the robustness of the impact estimates. Grounded theory approach and data triangulation process were followed to analyse qualitative data.

Quantitative data suggested that the training programme significantly increased participant adolescents' knowledge on climate adaptive technology by around 47 per cent. In addition, due to the intervention, participant adolescents spend less time in a week for leisure activities but devote more time per week for doing IGAs. However, the study could not find any significant impact on changing entrepreneurial ability

and aspiration of the participant adolescents. But, the most impressive impact was observed in terms of participation rate in IGAs using climate adaptive technologies. Data showed that 17 per cent of training participants had already started using of the climate adaptive technologies by applying their recently gained skills. But, impact estimates did not show any significant evidence on income generation within this only two-months-long post-intervention period.

Qualitative findings reveal positive perception of the participant adolescents regarding knowledge and skills gained from the training. They expressed their confidence and satisfaction with the training. Most of the adolescents found the session intensive and full of practical demonstrations. In addition, positive changes were observed in adolescents' attitude, ability to develop and implement realistic future plans. Adolescents were observed to think more and work hard to explore potential ways of applying their newly gained skills and knowledge, mostly in the sphere of respective household's farming activities.

Participation in the training highly encouraged the girls to be engaged with agricultural activities and contribute in their household income. They opined that this training had opened up a 'window of opportunity' to bolster self-development process.

Family involvement and local market were found to be played important deterministic role in the process of adolescents' participation in IGAs.

To conclude, the results are supportive to continue the training programme for increasing knowledge and develop skills on climate adaptive agricultural technologies among the adolescents in south-western region of Bangladesh. This pilot project opened up new windows of IGA participation and portrayed ways of becoming more empowered to the adolescents, especially to the girls in the changed livelihood paradigm. However, if BRAC could monitor and supervise participant adolescent activities in regular interval, provide necessary start-up capital, sensitise parents of the adolescents and their local elites, and ensure a coordinated cooperation from ADP, AFSP and MF together, which would be helpful to realise higher impact of SDIA.

The ISD for Adolescents on Climate Adaptive Livelihoods in Southwestern Bangladesh

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

There is an estimated 1.2 billion adolescents in the present world whose ages are between 10 and 19. These adolescents represent around 18 per cent of the total global population (UNFPA 2010). A major proportion (around 88 per cent) of the adolescents live in developing countries. The least developed countries are home to roughly 16 per cent of world's adolescents (UNICEF 2011). In Bangladesh, nearly 23 per cent of its total population is adolescent (BBS 2015). This large population group is considered the most potential source of future labour force in this country. In order to promote entrepreneurship and enhance self-dependency among them various skills development initiatives have been undertaken in this country. However, a large section of this adolescent population has limited scope for acquiring required knowledge and skills for self-development and participating in income generating activities (IGAs) (UNICEF 2016). Especially, in south-western region of Bangladesh, where agriculture based livelihood paradigms have been shifted from traditional paddy cultivation to aquaculture and homestead based small scale agricultural activities due to the erroneous effects of climate change, adolescents have been further challenged to develop their livelihoods. Considering the present context, BRAC has implemented a pilot project titled 'Skills Development Initiatives for Adolescents (SDIA) on climate adaptive livelihoods' in two climate affected districts of south-western Bangladesh in order to promote some climate adaptive agricultural technologies among the adolescents so that they can develop their skills and participate in relevant IGAs. Skills training includes fish feed (FF) preparation, compost fertiliser (CF) preparation, and orange fleshed sweet potato (OFSP) cultivation.

1.2 CLIMATE CONTEXT OF THE PROJECT IMPLEMENTATION AREA

River-bed siltation along with back water effect due to sea-level rise and high tide is leading to prolonged water-logging in south-western Bangladesh in recent 2-3 decades. The consequent loss in agricultural production due to the inundation of

about 128 thousand hectare of crop land was noticed in Jessore, Satkhira and Khulna districts that directly affect the lives and livelihoods of around one million people (Awal 2014). Satkhira is one of the severely affected areas, which has been facing the worst hit and experiencing year-round water logging. The prevailing situation has been made impossible the continuation of agricultural activities there. Biodiversity is being threatened and cultivable land has being shrunk. The situation is so harsh that there is no other way out, but to live with water.

This coastal south-western part is a cyclone prone area which is also highly affected by the fray of climate change. The agricultural context of Khulna and Satkhira has been changing and local people are coping with the changing circumstances by engaging in floating agriculture, crop production with Sorjan method, and fish cultivation in lowland to utilise the water-logged land around the southern region (Awal 2014).

1.3 HOW THE SKILLS ARE SUPPORTIVE TO DEVELOP CLIMATE ADAPTIVE LIVELIHOODS?

Climate change adaptation is an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (IPCC WG II 2001). Adaptation can prevent future risks, reduce present adverse effects and refer to individual or collective action (Annan 2009). In 2011, Clements *et al.* (2011) pointed out that climate change in many cases will lead to increased climatic variability and more extreme climatic events which will directly affect agriculture. Resilience to variation and the unexpected, and the capacity to adapt to a changing world are therefore cornerstones of adaptation (Clements *et al.* 2011). Adaptive capacity is defined as “the ability of a system (human or natural) to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences” (IPCC WG II 2001). Considering the articulation of the familiar and standardised narrative of climate change adaptation, the defined technological skills of this pilot project on which adolescents were provided training by AFSP staffs are considered supportive to develop climate change adaptive livelihood in various respects.

1.3.1 Fish feed (FF) preparation

The prolonged water-logging has posed challenges in safe water supply, sanitation, shelter, food security, and employment opportunity. In some areas where people are bound to live in waterlogged condition for nine months in a year; even many cultivated crop lands are permanently inundated leading to loss of valuable agricultural production, especially rice. Socioeconomic and agricultural activities have largely been hampered due to water logging (Adri and Islam 2010). Adaptive capacity of individuals, households and communities is shaped by their access to and control over natural, human, social, physical and financial resources (CARE 2010). In this

challenging agricultural context, the inhabitants of this south-western region have become involved with fish cultivation in lowland to utilise the water-logged land. Given their involvement with fish cultivation, they are in demand of fish feed to be used in the submerged perimeters where they cultivate fish. For this, they have to depend on fish feed market and spend a lot of money as well. The financial condition of the inhabitants of the area has been affected by the climate change effects. Using homemade fish feed, which is more cost effective, is a better alternative in this situation. Besides, the homemade fish feed is better than the purchased commercial ones as the latter is often contaminated as well as chemicalised, and therefore, is harmful for fish cultivation and pond ecosystem. On the other hand, in the case of homemade fish feed, all the required ingredients are bio-natural and easily accessible; and one can mix the ingredients in right amount. Considering the above mentioned instances gaining technological skills on preparing fish feed would become potential livelihood in the context of changing climate in this region.

1.3.2 Compost fertiliser (CF) preparation

Composting is the biological decomposition and stabilisation of organic substrates, under conditions that allow development of thermophilic temperatures as a result of biologically produced heat, to produce a final product that is stable, free of pathogens and plant seeds and can be beneficially applied to land. Thus, composting is a form of waste stabilisation; but one that requires special conditions of moisture and aeration to produce thermophilic temperatures. Maintenance of thermophilic temperatures is primary mechanism for pathogen inactivation and seed destruction (Haug 1993). Compost is well known as an environment friendly organic fertiliser. Use of compost fertiliser is beneficial for farmers for several reasons. It reduces the need for chemical soil conditioners and fertilisers. It adds nutrients and beneficial microbes, as well as increase water holding capacity and improves plant growth. Farmers can balance their soil's pH (acidity/alkalinity) by using compost in their field; and new vegetation can be established directly into compost (Risse and Faucette 2009). Using compost is good for both cereal crops and vegetables. It also reduces production cost (by reducing/eliminating use of chemical fertilisers) and presents an eco-friendly cultivation practice- both of which are very helpful for the inhabitants of the affected area.

Some farmers elevate and widen the periphery of their land by using it as a pond where fish is cultivated, and uses the boundary to cultivate horticultural crops like banana, country bean, etc. In this way, they basically try to utilize the waterlogged lands for maximum economic profitability and to reduce vulnerability by using sifting agriculture (Awal 2014). Considering these multidimensional utilities of using compost, and the climate change and sifting agriculture context of the project area, compost preparation has been identified as a "climate change adaptive livelihood" in the context of this study.

Programme considered the environmentally affected area to implement the project, so that a climate change adaptive behaviour can develop within the inhabitants of

the area. Compost using reduces the cost of chemical fertiliser and develops an eco-friendly cultivation practice which are very essential for the inhabitants of the affected area.

1.3.3 Orange fleshed sweet potato(OFSP) cultivation

Micronutrient deficiency has resulted in stunting in more than one-third of the global population(Allen *et al.* 2006). In many countries, agricultural growth has failed to drive greater dietary diversity among the poor (Heady 2012). For example, hunger and malnutrition are common in Malawi; and the challenges are compounded by a changing climate that hampers agricultural production, in turn aggravating health and socioeconomic problems. Vitamin A deficiency restricts growth, weakens immunity and eyesight and contributes to high childhood mortality (Nyekanyeka *et al.* 2013). Orange fleshed sweet potato (OFSP) is a bio-fortified crop which can play a contributory role to mitigate micronutrient (to be specific, Vitamin A) deficiency and food insecurity among the small poor farm households as well as in climate change affected areas.

Since 2014-15, BRAC has been promoting OFSP among rural small farm households in Bangladesh. Recently OFSP cultivation has been introduced to the adolescents in the south-western part of Bangladesh as a part of Promoting Climate Adaptive Technology (PCAT) project. Due to water-logging, rice and other crop cultivatable land of this area has shrunk. Since the pattern of agriculture of this area has shifted, OFSP can be a suitable food crop for the small farm households to meet the burden of food insecurity and nutritional deficiency. Cultivating this crop requires little land and few inputs, and can be stored on-farm for several months (Waized *et al.* 2015). In the climate change affected agricultural and environmental context of the south-western part of Bangladesh, training on cultivating OFSP would resulted in development of commercially and environmentally beneficial livelihood.

1.4 OBJECTIVE AND RESEARCH QUESTIONS

The main objective of this study is to evaluate the impact of the SDIA on climate adaptive livelihoods in south-western Bangladesh. To fulfill the objective, present study makes an effort to respond to the following research questions.

- ▶ What are the perceptions about the training and technologies?
- ▶ What is the impact of skills development training on knowledge, entrepreneurial attitude, future aspiration and practice in relation to specific IGAs for the adolescents?
- ▶ Are the adolescents able to initiate some IGAs and make some additional income for the households?
- ▶ How participation in the intervention change adolescents' intra-household decision-making power?

CHAPTER TWO

DESCRIPTION OF THE INTERVENTION

Under this pilot project, 100 adolescent members (50% was girl) from 25 BRAC Adolescent Development Programme (ADP) clubs were trained for a whole day in five batches on three agricultural livelihoods namely fish feed (FF) preparation, compost fertiliser (CF) preparation, and orange fleshed sweet potato (OFSP) cultivation. In addition, a booklet was provided to the participants that contains the detail procedure of fish feed and compost fertiliser preparation and OFSP cultivation. Each batch consisted of 20 adolescents who were selected from 4-5 different ADP clubs. The training sessions were conducted in field offices jointly by the trainers of BRAC Agricultural and Food Security Programme (AFSP), BRAC Learning Division (BLD) and ADP.

For selecting the training participants, the project staff applied the following selection criteria:

- ▶ age between 14-15 years;
- ▶ interested to participate in training;
- ▶ interested to start working following training participation;
- ▶ monthly household income of the adolescent member is no more than BDT 5,000 (USD 64);
- ▶ household of the adolescent member must own at least a tiny piece of farming land; and
- ▶ concerned guardians allow the adolescent to participate in the training.

Based on the information collected through a quick survey conducted by the project staffs, a primary list of around 250 eligible adolescent club members was prepared. The list was sent to the respective Regional Managers (RMs) for scrutiny. Then the respective RM checked the list and sent it to the head office for approval. From the approved primary list, the targeted 100 adolescents were selected by following a clustered randomised trial (see 4.1.1).

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CHAPTER THREE

LITERATURE REVIEW

We hardly found any empirical study on the impact of SDIA on climate adaptive livelihoods in Bangladesh. But, some studies are available which provide some empirical evidence on different skills and livelihoods development interventions for the adolescents in Bangladesh as well as in other country contexts.

Amin *et al.* (2016) evaluated BALIKA (Bangladeshi Association for Life Skills, Income, and Knowledge for Adolescents) project in Bangladesh. The BALIKA project helps to empower girls and reduce child marriage in Bangladesh. Intention-to-treat estimate of this randomised controlled study suggested that livelihood skills training in computers, entrepreneurship, mobile phone servicing, photography and basic first aid increased the likelihood of engaging in IGAs by one-third among the participant girls. This study also showed that BALIKA reduced probability of being married as child by 23% among the participants.

The Skills and Training Enhancement Project (STEP) supports public and private training institutions and provides modern equipment, teaching aids and learning materials to improve the quality of technical and vocational training in Bangladesh. The World Bank (2016) mentioned in a featured story that within six months of the training course completion, around 46 per cent of the participant youths got employed.

In Columbia, Attanasio *et al.* (2009) evaluated the impact of a randomised subsidisation of a vocational training programme for disadvantaged youth. Their study showed that the training programme raised earnings and employment, especially for women. Women offered training earn 18% more and had a 0.05 higher probability of employment than those not offered training, mainly in formal sector jobs. Cost benefit analysis of this study suggested that the programme generated much larger net gains than those found in developed countries.

Another randomised evaluation done by Bandiera *et al.* (2012) in Uganda showed that ELA (Empowerment and Livelihood for Adolescent) programme of

BRAC significantly improved HIV and pregnancy related knowledge, as well as corresponding risky behaviours among those sexually active; self-reported routine condom usage increased by 50%. With regard to outcomes related to vocational training, the intervention raised the likelihood of girls being engaged in IGAs by 35%, mainly driven by increased participation in self-employment. The findings suggested that combined interventions might be more effective for adolescent girls than single-pronged interventions aiming to change risky behaviours solely through related education programmes, or to improve labour market outcomes solely through vocational training.

Blattman, *et al.* (2012) evaluated a government operated nearly unconditional and unsupervised cash transfer programme for the unemployed youths, aged roughly 16 to 35, in Uganda. Following a clustered randomised trial at self-developed group level, their study found that around 83 per cent of the potential treated group applied for and received the cash transfer. ITT estimates of their paper suggested that despite a lack of central monitoring and accountability, most youth invested the transfer in vocational skills and tools. Furthermore, the economic impacts of the transfer were large: hours of non-household employment double and cash earnings increased by nearly 50% relative to the control group. Moreover, the estimates suggested that, on average, the transfer yielded a real annual return of 35% on capital.

An experimental study on Growing America through Entrepreneurship (GATE), which was a random-assignment demonstration project designed and implemented by the US Department of Labor (DOL) and the US Small Business Administration (SBA), led by Fairlie, *et al.* (2014) who suggested that Project GATE could not increase business income significantly. In addition, there was no evidence in their evaluation that training lowered exit rates or increases likelihoods of being in business at follow-up for those who were business owners at baseline. However, they found that businesses created by the treatment group had greater longevity than businesses created by the control group.

Erica *et al.* (2010) evaluated a randomised business training for women in India. The women were randomly drawn from the SEWA Bank customer database who met three criteria: actively saving or borrowing from SEWA Bank in the past two years, owns a business or is self-employed and is aged 18 to 50. The heterogeneous treatment effects suggested that among Hindu women, training increased borrowing and business income for those facing more restrictions. However, Muslim women failed to benefit from the training programme. Given the similarity in household wealth and types of businesses across social groups, the difference across the groups in their response to business training is stark. The training helped women whose businesses had been held down by social restrictions; but women subject to extreme restrictions had too little agency to easily change their aspirations or activities. Even with more knowledge or higher aspirations, the most restricted women might face too many social strictures to avail themselves of entrepreneurial opportunities.

CHAPTER FOUR

METHODOLOGY

To evaluate the impact of the SDIA, this study followed quantitative driven mixed methods. It has been recognised over time that mixed methods provides inclusive framework to avoid information biases by triangulation across quantitative and qualitative data and generate comprehensive knowledge on evidence (Jick 1979; Greene *et al.* 1969; Tashakkori and Teddlie 1998). The quantitative method evaluated the impact by estimating counter factual. On the other hand, case study and livelihood trajectory methods were followed to qualitatively investigate the context and process of the impacts.

4.1 QUANTITATIVE METHOD

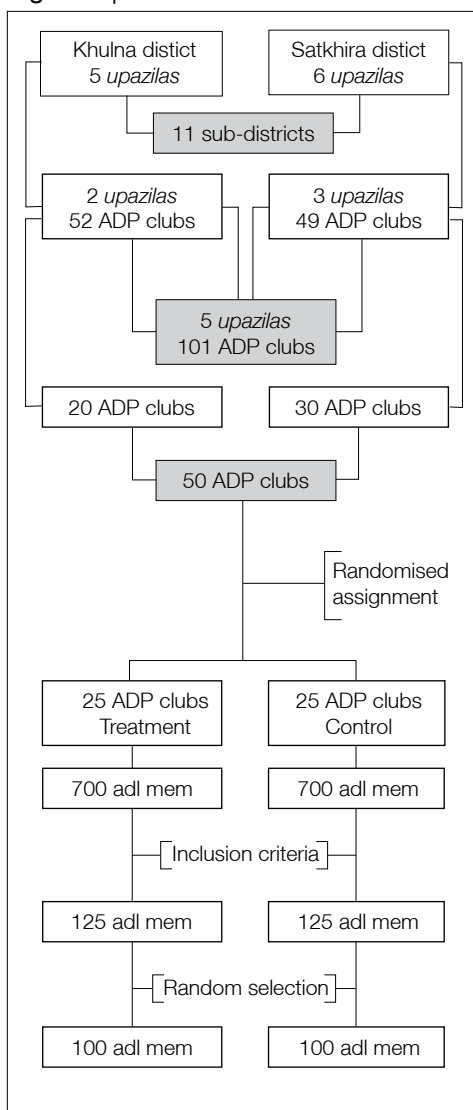
This study followed a clustered randomised control trial (RCT), which is a widely accepted method used for quantitative measurement of the impact (see: Bandiera, *et al.* 2012; Attanasio, *et al.* 2009; Erica, *et al.* 2010; Blattman, *et al.* 2012). This technique provides a unique way to construct a valid comparison group and estimates unbiased counter factual by preventing treatment contamination across the treated and controlled groups (Bandiera *et al.* 2012).

4.1.1 Clustered RCT design

Under the clustered RCT design the following steps were followed in this study. Step 1: two climate affected districts- Khulna and Satkhira were selected for implementing the SDIA. Step 2: from 11 *upazilas* of Khulna and Satkhira, five *upazilas* were randomly selected. Step 3: 50 ADP clubs were randomly selected from a total of 101 ADP clubs in the selected 5 *upazilas*. Among the selected 50 ADP clubs, 25 were randomly assigned for the intervention and rest 25 clubs were kept as control. Clustering was done at ADP club level to prevent potential contamination among treatment and control groups. On an average, there were 28 adolescent members in each ADP club, which summed up to 1,400 adolescent members. Step 4: from each of the 50 ADP clubs,

five adolescent members were selected based on the inclusion criteria discussed in chapter 2 of this report. To select eligible ADP club members, this study used data provided by the programme staffs. Through this selection, a total of 250 members were identified as eligible for getting the intervention. Around fifty per cent of them were females. Step 5: finally, from 125 eligible adolescent members of 25 treatment clubs, 100 members were randomly selected for participating in the treatment. Similarly, another 100 ADP club members from 125 eligible adolescent members of 25 control clubs were also randomly selected. The clustered RCT design is illustrated in Fig 4.1.

Fig 4.1 | Clustered randomisation



4.1.2 Sampling and data collection

Required quantitative data was collected from all 200 randomly selected ADP club members (from both treatment and control groups). Pre-intervention data i.e. baseline data was collected during mid-March 2016 and post-intervention data i.e. follow-up data was collected during end May - early June 2016. During both surveys, structured questionnaire interviews were employed to collect data. Data was collected on:

- ▶ socio-demographic characteristics of adolescents’ households;
- ▶ economic activities of household members;
- ▶ adolescents’ intelligence; memorising power; risk adherence; entrepreneurial ability and future expectations; personal expenses; and technological knowledge and its applications.

4.1.3 Data analysis and impact estimation technique

Both the descriptive and inferential techniques were used to analyse data. To estimate the intention-to-treat (ITT) effect of the SDIA, this study used

Analysis of Covariance (ANCOVA) technique. ANCOVA has been advocated by many studies to estimate the impact coefficient when autocorrelation in outcome variable is significantly lower (see: Ahmed *et al.* 2016; McKenzie 2016; McKenzie 2015; Wydick *et al.* 2016). McKenzie (2016) suggested that when auto correlation is lower, ANCOVA gives more statistical power to the impact estimate. According to Gujarati, *et al.* (2009), the auto correlation of a random process is the correlation between values of the process at different times, as a function of the two times or of the time lag.

In regression framework, this study estimated the auto correlation of the outcome variables by the following regression model:

$$X_{i2} = \alpha + X_{i1}\beta + \varepsilon_{it} \quad [i=1,2-N]$$

where, x_{i2} represents baseline observations of an outcome variable and x_{i2} represents follow-up observations of same outcome variable. Regression coefficient ρ represents the auto correlation estimate. It is well practiced by the available literature that when auto correlation is found smaller than 0.5 ANCOVA technique should be employed to estimate the impact. In this study, autocorrelation estimates for all the outcome variables are found smaller than 0.5 therefore, this study employed the ANCOVA technique for estimating the impact of the intervention on those. The ANCOVA regression specification is:

$$X_{i2} = \alpha + X_{i1}\beta + \text{treat}_{it} + \varepsilon_{it} \quad [i=1,2,3-N]$$

where,

X_{i2} = follow-up observation of an outcome variable of sample i ;

X_{i1} = baseline observation of an outcome variable of sample i ;

treat_{it} = binary variable which represents treatment status of sample i ;

1 = treatment and

0 = control. This coefficient gives the estimate of the impact on the outcome variable.

τ = this coefficient gives the estimate of the impact on the outcome variable.

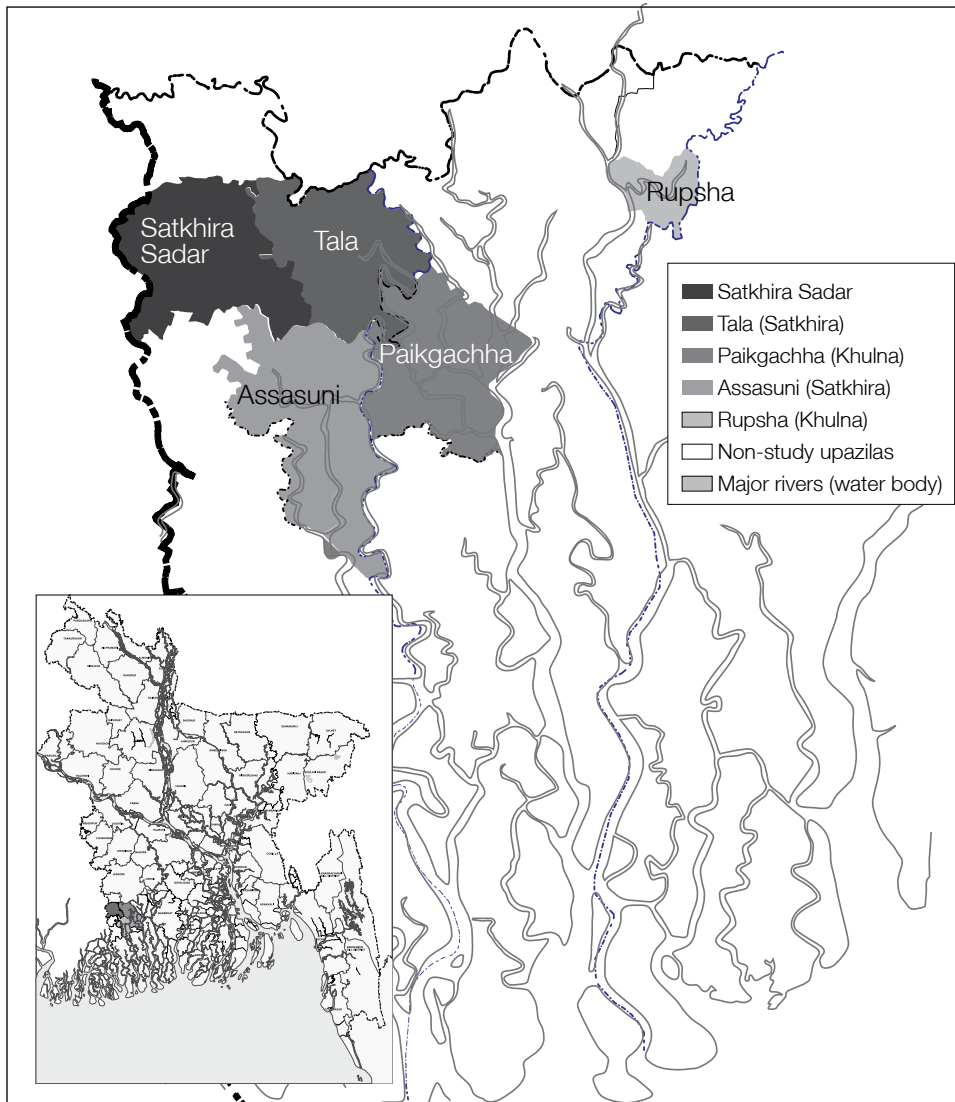
4.2 QUALITATIVE METHOD

This study adopted the ‘concurrent procedure’ to evaluate the intervention qualitatively. Concurrent procedure refers to the simultaneous collection and analysis of both qualitative and quantitative data. While collecting and analysing qualitative data special focus was given to understand the process and context of the changes in knowledge on climate adaptive technologies, entrepreneurial attitude, future aspiration, satisfaction about the training, time use, income generation, and decision making power, which were being eventuated in adolescents’ lives by participating in the intervention.

4.2.1 Sampling and study site

This study used qualitative data from participant adolescents only at post-intervention period. Sample adolescents for qualitative data collection were selected purposively following the ‘maximum variation’ technique. To select the sample three steps were followed. First, four different *upazilas* were selected (see) considering the variation in terms of livelihood pattern, local topography and climate change vulnerability which were Ashashuni and Tala from Satkhira district and Paikgachha and Rupsha from Khulna district (Fig 4.2).

Fig 4.2 | Study site

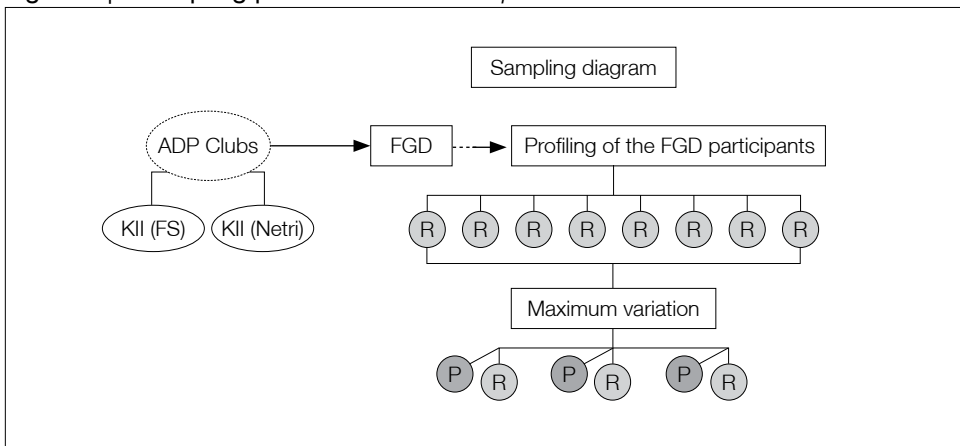


Second, in each *upazila* one Focused Group Discussion (FGD) was conducted. In each FGD adolescents were present from four selected treatment ADP clubs from the respective *upazilas*. In two *upazilas*, FGDs were conducted with the presence of only girls and in other two *upazilas*, FGDs were conducted with the presence of only boys. Usually, 5-11 adolescents were present in each of the FGDs.

Third, after conducting the FGDs, individual profiles for every respondents were created. On the basis of their profiles, a total of 13 adolescents were chosen as respondents for In-depth Interview (IDI). The respondents were variant in terms of gender, age, education, occupation, household's economic status, land ownership, geographical reality and livelihood. Among the 13 adolescents six were boys and seven were girls.

The sampling procedure for qualitative exploration was illustrated by . Here “R” refers to the adolescent who got training and was selected for case study. “P” refers to the parents of the selected adolescent. “FS” refers to Field Staff of ADP, and “Netri” means the leader of ADP club.

Fig 4.3 | Sampling procedure for each *upazila*



4.2.2 Data collection tools

FGD and IDI were the major tools to collect qualitative data from the respondents. However, Key Informant Interview (KII), informal discussion and intensive field observation complemented the data collection effectively to enrich qualitative insights. Using FGDs the qualitative team tried to portray a comprehensive picture of the adolescents' mobility, wealth ranking and linkage with potential local stakeholders. Informal discussions were conducted with the parents of the selected sample adolescents. IDIs along with observation were used to understand individual livelihood trajectory of the adolescents. Data collection effort was continued until reaching the data saturation level.

The qualitative research team stayed in the field for couple of days and built good rapport with field staffs of ADP which provided them compatible access to the respondents, which helped the team effectively to collect data in a proper way.

Table 4.1 | Qualitative data collection tools and number of respondents

Research Tools	Area wise respondents				
	Ashassuni	Tala	Paikgacha	Rupsha	Total
FGDs	11	5	6	7	29
IDIs	3	3	3	4	13
KII (Staff)	1	2	0	1	4
Informal discussion (Parents)	2	2	3	2	9
KII (Netri/leader)	4	3	1	2	10
Total respondents	65				

4.2.3 Data analysis procedure

Data was triangulated and cross-checked in both point of views- inter tools and inter methods. Members of the qualitative research team discussed among themselves every day's field work so that they could identify the areas in need of intensive digging, share their reflections as well as develop framework of data analysis and interpretation. Grounded theory and case analysis approach was used in analysing the qualitative data.

In grounded theory approach, researchers attempt to derive a general, abstract theory of process, action or interaction grounded in views of participants in a study. This process involves using multiple stages of data collection and the refinement and inter-relationship of categories of information (Strauss and Corbin 1990). In case studies, the researchers explores in-depth of a programme, an event, an activity, a process or one or more individuals. The cases are bounded by time and activity; and the researchers collect detailed information using a variety of data collection procedure over a sustained period of time (Stake 1985).

CHAPTER FIVE

RESULTS AND DISCUSSIONS

This chapter provides detailed results and subsequent discussions based on both quantitative and qualitative data analyses. In the first section, descriptive and inferential statistics from quantitative data are presented that include balancing tests of baseline characteristics between treatment and control group, attrition analysis, treatment uptake status, training participants' perceptions about the intervention, and impact estimates on different outcome variables. The second section includes qualitative findings and discussions on the process and context of gaining technological knowledge and its use by participant adolescents. It also includes discussion on how this intervention has opened up new windows of opportunities for the adolescent girls and which constraints have challenged realising the full potentials.

5.1 FINDINGS FROM QUANTITATIVE DATA

5.1.1 Balancing tests

Baseline or pre-intervention data on different socioeconomic, demographic characteristics and outcome variables were collected from all 200 adolescents from both treatment and control groups. Before estimating the impact of the SDIA, it is crucial to see whether selected ADP club members in both treatment and control groups are observably similar or balanced in terms of different pre-intervention characteristics and outcome variables. If they are not balanced, any significant difference found among the treatment and control group may potentially bias the impact estimates.

Using student's t-tests, this study analysed the balancing between treatment and control group in terms of selected observable characteristics and outcome variables. The balancing test results are given in Table 5.1. Data showed that except access to tube-well water, both the treatment group and control group are statistically balanced in terms of different selected characteristics and outcome variables. It

is only about 0.05 per cent of total number of variables which is unbalanced over the groups. According to Khandker *et al.* (2010), if less than 5% of total number of baseline variables is found unmatched over the treatment and control groups do not necessarily biased the impact estimates.

5.1.2 Sample attrition

“Attrition is a common form of nonresponse that occurs when some units drop from the sample between data collection rounds” (Gertler *et al.* 2011). Attritions are particularly problematic in the context of impact evaluations because they may create differences between the treatment group and the control groups (Glennester and Takavarasha 2013). It may produce biased estimates if attrition patterns are not similar in both groups or if there is any systematic pattern of attrition.

During the follow-up data collection, this study could not reach 9 respondents out of 200 which were surveyed at the baseline. The attrition rate is 4.5 per cent which is observed almost equal in both treatment and control group. The main reasons of attrition are: a) respondents were in school or in relatives’ houses during the interview; b) respondents migrated from their original location; and c) respondents were married and left their parents’ houses. Moreover, attritions were not systematically correlated to intervention and other covariates.

Table 5.1 | Baseline balancing test results

Variables	Treatment	Control	Difference	p-value
Characteristics of the adolescents and their households				
Member’s sex (1=boy)	0.46	0.51	-0.05	0.48
Member’s age (year)	14.89	14.66	0.23	0.42
Member’s school going status (1=currently going)	0.96	0.92	0.04	0.24
Intelligence (0-100)	61.10	61.00	0.1	0.97
Risk adherence (0-100)	37.60	44.80	-7.2	0.20
Mobility index (0-100)	64.96	65.21	-0.25	0.93
Age of HHHead (year)	44.93	45.55	-0.62	0.63
Age of HHHead’s spouse (year)	37.77	38.40	-0.63	0.53
Schooling of HHHead (year)	4.16	6.08	-1.92	0.18
Total asset value (BDT)	1,41,878	1,36,422	5,456	0.80
Total owned land (decimal)	35.62	28.94	6.69	0.42
House ownership status (1 = own house)	1.04	1.03	0.01	0.78
Access to sanitary latrine (1=yes)	0.58	0.67	-0.09	0.19
Access to tube-well water (1=yes)	0.93	0.82	0.11	0.02

[Contd...]

[Table 5.1 Contd...]

Variables	Treatment	Control	Difference	p-value
Access to electricity (1=yes)	0.80	0.78	0.02	0.73
Selected outcome variables				
Entrepreneurial ability index (0-100) ¹	63.26	65.25	-1.99	0.39
Knowledge on technology (0-100)	45.07	43.47	1.60	0.65
Time used for schooling (hour/week)	44.13	45.28	-1.145	0.68
Time used for household chores (hour/week)	5.12	5.65	-0.54	0.59
Time used for club activities (hour/week)	3.81	3.48	0.34	0.41
HH's income (BDT/month)	12,705	10,493	2,212	0.40

5.1.3 Participation in the intervention

All the selected eligible 100 ADP club members were offered to participate in the training. However, data showed that out of 100 ADP club members this study could successfully interview 96 club members during the follow-up survey. Among them, 88 were found participated in the offered training activities.

5.1.4 Participants' perceptions on the effectiveness of the intervention

Data show that around 93 per cent of the training participants reported the training activities were effective in helping them to develop new skills and engage in IGAs. The participants who reported the training activities were not effective enough pointed out some shortcomings of the intervention such as-shorter duration of the training, limited availability of necessary raw materials in their locality, lower engagement of parents, financial constraints and so on.

5.1.5 Preservation of booklet

A booklet, which contains all technical details of fish feed preparation, composting, and orange fleshed sweet potato cultivation, was given to every participant during the training session. The main aim of providing this booklet was to support them during post-training period to properly apply the newly developed skills. According to the collected data, 73 per cent of the participants preserved the booklet properly and could show it during the follow-up survey.

5.1.6 Application of newly developed skills

Among 88 training participants, 15 (around 17 per cent) had already applied their newly developed skills to develop alternative climate adaptive livelihoods and generate income (see Table 5.2). Data show that eight participants have had started fish feed preparation, five participants have had started composting, and two participants have had started orange fleshed sweet potato cultivation.

Table 5.2 | Up-take of newly developed skills by the participants

Name of skills	No. of participants		
	Boys	Girls	Sub-total
Fish feed preparation	2	6	8
Composting	2	3	5
Orange fleshed sweet potato cultivation	1	1	2
Total			15

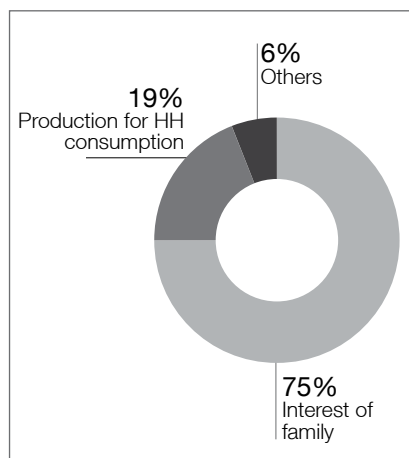
5.1.7 Use of land for applying new skills

Access to cultivable land provides supportive base to develop agriculture based livelihoods. In many cases, application of the newly developed skills may require use of homestead or cultivable land by the participant adolescents. From data, it was found that among 15 participants who had already applied newly gained skills, nine participants used owned cultivable land either for fish feed preparation or composting or orange fleshed sweet potato cultivation. Remaining six participants did not use any land, as fish feed preparation does not always require using of cultivable land.

5.1.8 What helped adolescents to apply new skills

Besides access to land and other necessary resources, many other factors were supportive for the participant adolescents to apply their newly gained skills (see Fig 5.1). According to the available data, interest of other household members of adolescents helped them to apply new skills. In addition, it was well perceived by few adolescents' households that application of new skills may supply necessary inputs for household production as well as do help in supplying food items. This perception also helped the adolescents to apply the new skills.

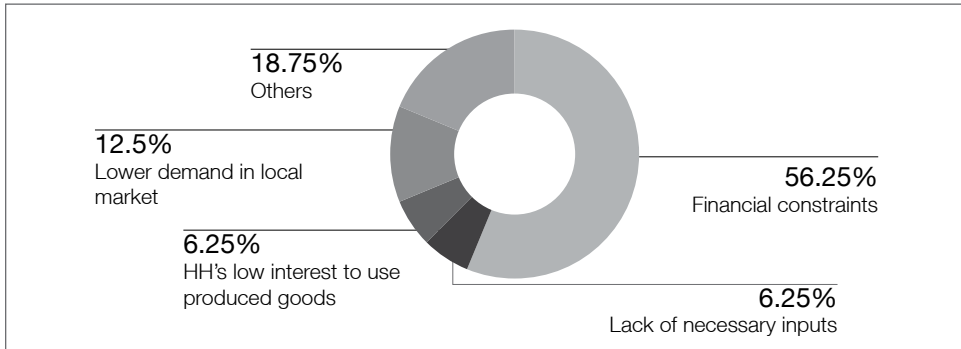
Fig 5.1 | Supportive factors to apply new skills



5.1.9 Challenges faced by the adolescents to apply new skills

Adolescents faced a number of challenges to apply the newly gained skills for developing climate adaptive agricultural livelihoods (see Fig 5.2). Financial constraint ranked top among these challenges. Around 56 per cent of the adolescents reported that they could not apply the new skills due to the lack of necessary working capital. Lack of necessary inputs and lower demand for the produces in local market further challenged around 19 per cent of the adolescents. Moreover, 12 per cent of them reported lower demand in their locality of home-grown fish feed and compost fertiliser as a major challenge to keep them on applying the new skills.

Fig 5.2 | Challenges faced by the adolescents to apply newly developed skills



5.1.10 Impact estimates of the intervention

ANCOVA technique was used for estimating the ITT effects of the SDIA as auto correlation was found less than 0.05 in selected outcome variables. The impact estimates on different outcome variables are presented in Table 5.3.

Table 5.3 | Impact estimates using ANCOVA

Outcome variable	ANCOVA estimate	Baseline mean of treatment group
Entrepreneurial ability index (0-100) ¹	0.11 (3.52)	63.26
Technological knowledge	21.22*** (4.51)	45.07
School attendance (hour/week)	2.23 (3.81)	45.26
Time spent for doing household chores (hour/week)	-1.30 (1.25)	5.65
Time spent for attending club activities (hour/week)	0.77 (0.52)	3.48
Leisure time (hour/week)	-6.45* (3.56)	8.43
Time spent for IGA (hour/week)	2.81* (1.55)	4.22

N = 191; Robust standard errors in brackets, which are clustered at the club level.¹

* p<.1, ** p<.05, *** p<.01

¹ The entrepreneurial ability index is the cumulative and rescaled score aggregating the self-assessed ranks to the following activities (where 10 was the highest rank and 1 the lowest): "Run your own business", "Identify business opportunities to start up new business", "Obtain credit to start up new business or expand existing business", "Save in order to invest in future business opportunities", "Make sure that your employees get the work done properly", "Manage financial accounts", "Bargain to obtain cheap prices when you are buying anything for business (inputs)", "Bargain to obtain high prices when you are selling anything for business (outputs)", "Protect your business assets from harm by others", "Collecting the money someone owes you".

Results show that the intervention, i.e. the SDIA, significantly increased technological knowledge on fish feed preparation, composting, and orange fleshed sweet potato cultivation. Compared to the non-participants (control group) participant adolescents (treatment group) gained 21.22 point more technological knowledge. In other words, technical knowledge was increased by around 47 per cent.

The intervention also significantly increased time spending in income generating activities of the participant adolescents compared to the non-participants. Participation in the treatment increased adolescents' time spending by 2.81 hours per week (around 67 per cent) for doing income generating activities. The intervention also reduced leisure hour per week significantly. ANCOVA estimate shows that treatment group devoted 6.45 less hours per week for enjoying their leisure after participating in the intervention.

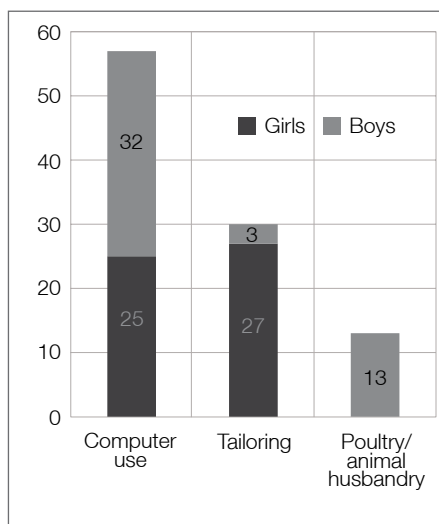
According to the ANCOVA results, there was no significant impact on other outcome variables such as- adolescents' entrepreneurial ability index; hours of schooling, household chores, and club activities. However, point estimates suggest that compared to the non-participants, the intervention increased participant adolescents' entrepreneurial ability, time spending on school attendance, and club activities by 0.11 point, 2.23 hour per week and 0.77 hour per week, respectively. In addition, point estimate suggests that the intervention reduced time spent for household chores by 1.30 hours per week.

Quantitative data found that none of the participant adolescents who applied the newly gained skills could generate any income within the short 1.5 month-long post-intervention period. However, more explorative views are presented in qualitative findings section in this regard.

5.1.11 Participants' expectations from BRAC for realising more potential

The participant adolescents expressed some further expectations from BRAC to facilitate the application of newly gained skills for developing their livelihoods and generate income for the households (see Fig 5.3). Analytical findings show that around 59 per cent of participant adolescents expected that BRAC should provide required financial assistance with flexible terms. In addition, regular supervision and/or monitoring was expected to be strengthened, by around 16 per cent participants. Furthermore, around 11 per cent adolescents expressed their expectation that BRAC would ensure availability of necessary

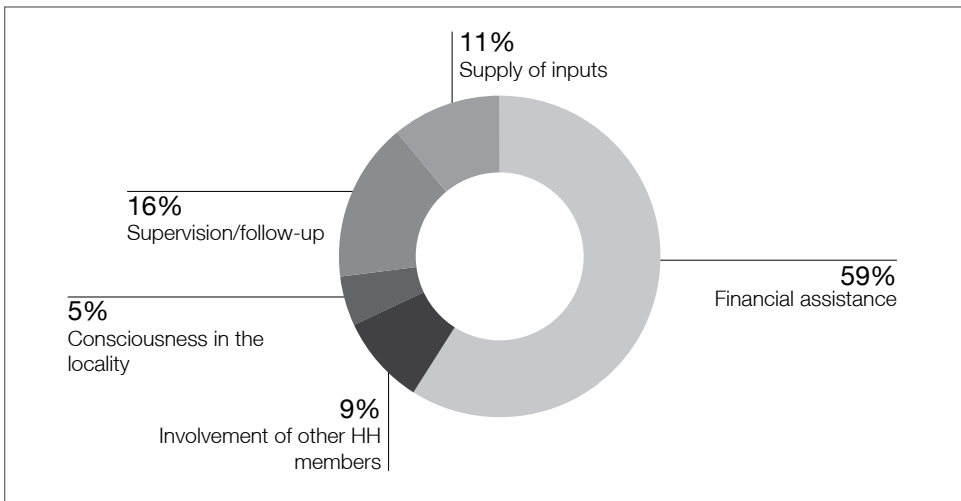
Fig 5.3 | Participants' further expectations from BRAC



inputs for fish feed preparation and orange fleshed sweet potato cultivation. The adolescents also hoped that the programme staff of BRAC would involve their parents during the training and post-training follow-up periods.

Additionally, a number of adolescents from the control group suggested that offering some other skills development trainings mainly on computer use, tailoring, and poultry and animal husbandry would be beneficial (see Fig 5.3). According to them, these trainings may effectively help adolescents to develop new skills and engage in IGAs in climate affected region.

Fig 5.4 | Demand for other trainings among the non-participant adolescents



5.2 QUALITATIVE RESULTS AND DISCUSSIONS

5.2.1 Gaining knowledge and skill: satisfaction and confidence

Through a demonstration based intensive training session, adolescents gained comprehensive knowledge and skills on three nominated agro-technologies- fish feed preparation, compost fertiliser preparation, and OFSP cultivation. During qualitative exploration, most of the respondents could explain well the procedure and uses of the three agro-technologies which were trained during the intervention and portrays similar findings to the quantitative estimate that SDIA increased technological knowledge among the participant adolescents. Qualitative findings reveal their confidence and satisfaction with the newly gained skills and knowledge. The following words of an adolescent girl named Pia from Ashasuni is worth mentioning here.

I have got the training. I am pretty sure that now I know very well about these three technologies. I am interested in cultivating OFSP in my homestead by using compost fertiliser, because OFSP is very nutritious and it helps to fight vitamin A deficiency.

In passing, the respondents were found to perceive that homemade fish feed was better than commercial fish feed. They were also anxious about the use of contaminated commercial fish feed as well as the harmful effect of the chemicals which are often used in commercial fish feed.

5.2.2 Perception about training manual (booklet)

In training session, a manual (booklet) was provided to every participants. In that booklet, all the three technologies were described elaborately. During FGDs it was found that everybody had kept the booklet in a safe place in their house. They said that the booklet was a good read with fantastic illustrations which was easily understandable. They perceived it as a very useful material as they could always consult when necessary. They often brought the booklet to ADP club to share with other members who did not get the training. They also gave it to their parents and siblings so that they could realise the effectiveness of the training and keep trust on them.

5.2.3 Knowledge leading to change in attitude and cognition

The newly introduced skills and knowledge brought some changes in the attitude of the participant adolescents. Changes could be noticed in their perceptions towards participation in IGAs as well as in their ability to make realistic plans related to IGAs and play pro-active roles in implementing such plans.

Such IGA oriented skill development training was a completely new experience to most of the participants. The training stimulated them to be involved in IGAs. They started thinking about possible ways to use their knowledge and skill gained from the training. Then they tried to influence potential family members who could help them, by sharing the newly received knowledge. While coming up with the ideas and plans, they followed a highly rational and practical approach taking into consideration their surrounding contexts, resources and limitations. The experience of Ankhi, an adolescent girl from Ashasuni, is worth sharing here. Since her family had no land or fishpond, it was difficult to her to apply the skills and knowledge. Then she thought that she could take advantage of the fact that her maternal uncle had a fishpond and was commercially cultivating fish. In her own words, she explained the situation as follows.

Firstly, I talked to my (maternal) grandma about the training and the knowledge I have gained from there. Then I asked her that if I prepared fish feed, whether she could help me to sell it to my (maternal) uncle. After listening attentively and a bit of thinking, she assured me that she would discuss it with him and would try to convince him.

This showed how Ankhi tried to use her kinship in pursuing a pathway or opportunity for implementing her gained skills and knowledge.

Findings from the FGDs reveal that the adolescents became aware regarding participation in IGAs through the agriculture oriented skill development training. They also believed that their credibility increased to their parents, friends and even neighbours because of receiving training from BRAC. Such positive changes led to increased self-confidence among the adolescents.

One particular finding worth mentioning is that most of the adolescent were found to look for opportunities of access within their households' farming activities and utilise their existing farm set up. In this regard, Moumita from Rupsha shared her experience in the following words.

My family, especially my grandmother has been thinking for a while about digging a fishpond beside our house. But it was delayed as my father was indecisive about it. After receiving this training, I told my grandma the things I have learned, especially the procedure of fish feed preparation. I explained to her that if I can prepare fish feed for our fishpond, it will be easier and cost effective to cultivate fish and we (the female members of the household) will be able to take care of it. Then my grandma convinced my father to dig the pond quickly and he was convinced; now we have a fishpond where we have started cultivating fish. Therefore, I strongly believe that this training has been extremely beneficial for me and my family.

These findings indicate that the adolescents mostly wished to contribute to their households' farm activities and income. In particular, they wanted to reduce the household farm's production cost and increase the quality of produces. They also believed that if they wanted to initiate an entrepreneurship, they first needed to make some demonstrations so that their neighbours could watch their activities and the outcomes and become interested in their prepared fish feed/compost and grown OFSP. Since the study area was in south-western part of Bangladesh, due to the waterlogging context there were plenty of fishponds. Some of the respondents whose family already had fishponds tried to make fish feed and used it in their ponds. Overall, it was observed that fish feed and compost preparation

Moumita
with her
father beside
their newly
dug pond



were more popular than OFSP cultivation among the respondents. Easy accessibility to necessary inputs, as well as specific socioeconomic and agricultural context of the respondents played a vital role behind the popularity of these two livelihood options. Compared to these, OFSP was a relatively new variety in that area and getting the vines necessary for production proved to be difficult.

5.2.4 Dependency on parents/household members

It was observed that the adolescents could not take any effective initiative to implement their plans without consent of the influential household members. After getting the training, they shared their experience with their household members and tried to obtain necessary help from them. Quantitative findings also show that family support had a vital role in the continuation of their IGA activities using the gained knowledge, as about 69% of the respondents reported needing financial help from their family. In cases where family members were not supportive, the adolescents could not continue with their ventures. Jhumur from Ashasuni shared such an experience. In her own words,

After getting the training, I started preparing fish feed and used it in our fish pond a few times. But I couldn't continue, as my father was not interested in giving me any more financial support after the first time.

5.2.5 "New window" for adolescent girls

Because of being mostly agriculture oriented, training on the three livelihood options insisted the adolescents to focus on their household farm. Particularly for the adolescent girls, it opened a new window of opportunity to contribute to their household income by using their gained skill and knowledge. In FGDs, the girls mentioned that it would be helpful for them even in future, as they would be able to utilise this skills and knowledge after getting married and being housewives.

It was observed that adolescent girls were usually interested in training on ICT, embroidery, tailoring, etc. for IGA engagement rather than any agriculture oriented training. But such agriculture oriented skill development training made them realise that they could also contribute to their family farm's production. They were inspired to generate income using their skills and knowledge achieved from the training, and became encouraged to be engaged in some particular agricultural activities that were generally known as male dominated. The experience, strong determination and realistic planning of Pia, an adolescent girl from Ashasuni, are worth sharing here. In her own words,

We have a piece of land which is surrounded by neighbours' houses. Therefore, power-tiller cannot be entered there, and we cannot cultivate any crop. After getting this training on OFSP cultivation and compost preparation, I discussed with my mother that we can use this piece of land for OFSP cultivation by digging with grubber. Simultaneously, we can prepare compost and use it for OFSP cultivation. My mother has agreed. Now I'm trying to manage OFSP vine. Due to my father's apathetic attitude, we often face shortage of food. OFSP can help us in those odd days and we can also earn from it.

5.2.6 Contribution in household income

It emerged from the qualitative observation that the time gap between providing training and conducting impact assessment survey was too short to generate income for the adolescents by implementing their newly gained knowledge and skill. The same thing was reflected in quantitative results as well, as there was no remarkable impact in income generation for the adolescents.

However, several instances of the adolescents using the newly gained skills and knowledge in their household farming activities were found during qualitative exploration, which would ultimately lead to increase in household income. Many of the respondents were actively involved with various IGAs operated by their household members, and therefore, were already in the process of income mobilisation for their respective households (initially, often through cost minimisation). The experiences of two respondents, in their own words, are shared here to shed more light on this.

Riaz from Rupsha said,

From the training I became interested about fish feed preparation. As I shared my plan with my mother, she advised me to start by preparing small quantity. I did that and gave it to the fishes in our pond in the presence of my two elder brothers. After a while the fishes started to eat, and my brothers were highly impressed. I also explained that it was very cost effective. Since then they always have me, and I regularly prepare the fish feed and use it in our fish pond.

Another adolescent Swarup, also from Rupsha, said,

I prepared fish feed and gave it to fish 2-3 times. My father took it positively and said that if he bought it from the market, he would have to spend BDT 1000-1200. But preparing the homemade fish feed required only BDT 200-300. This way the training has helped my family to lower the production cost, and therefore, increase our (net) income.

5.2.7 Decision-making

“...[A]cross the Indian subcontinent, in both rural and urban locals, even while the outward forms of the family are changing, strong traditional family values prevail and create a vital family life for adolescents and youth” (Verma and Saraswathi 2002). Consequently, in the perspective of Bengali culture,

Riaz is seen with his homemade fish feed



the household head usually takes the household decisions. Even though sometimes he or she discusses with other members of the household, adolescents are often ignored or are not given proper importance in the decision-making process. During qualitative investigation, it was observed that the adolescents were dependent on their household members in various aspects. Because of being young in age, they were treated as immature and novice, especially in the case of taking any important household decision. This was the case even when the decisions directly concerned them. In most of the cases, the adolescents could not make any decision individually, and were guided by their parents or other influential household members. Only in a few rare cases, it was found that their participation in household decision making was encouraged and appreciated by their parents.

It is true that the overall situation was not that favorable for (most of) the adolescents to make individual decisions regarding involvement with IGAs by using their household facilities. But parents of the adolescents showed a positive attitude to the skill development training which was provided to their children. They thought that it would ultimately help them to become self-dependent and improve their future. Such positive perception of the parents was favorable, at least to a certain extent, for the adolescents to materialise their plans and ideas related to IGAs. In this regard some statements from the parents of the adolescents could provide some important insights.

Father of Suman from Tala said,

I am pleased with my son's learning from the training that you (BRAC) provided. As per his maturity he has planned well, I also think he is in right track. If homemade compost can be used in our land it will be good for our soil and crops.

Help from household members is very important for the adolescents to implement their income generating plan. Especially household head or main earning member's support is very vital. In this regard Moutita's father from Rupsha said,

Suman's parents were seen expressing their perception



I have dug a new pond beside my house. I thought as my daughter got training on fish feed preparation, she would be able to generate some income from fish cultivation. Moreover, since it (the pond) is not far away from our house, they (female members of the household) can look after it, too. Considering all circumstances, I have agreed with her plan and have given her support. Good and rational idea or opinion of my daughter is

always highly appreciated and supported. But, irrational or bad ideas are always discouraged.

5.2.8 Change in Aspiration

Qualitative findings reveal that in some cases the skill development training was able to develop aspiration among the participant adolescents. The following case of an adolescent boy from Tala portrays the contribution of the training in shaping aspirations of an adolescent.

Rubel Das is an adolescent boy from Tala, who lost his father about 9-10 years ago. His father was a tenant farmer and was the only earning member of the family. After his death, the family became very vulnerable. At that time Rubel was a student of class 1, and he as well as his two brothers were too young to earn. His mother worked as a housemaid in neighbour's house. She also became a member of STUP programme of BRAC in 2014. They had been passing very miserable days. Rubel had to drop out of school after completing class eight.

Moving on to present days, Rubel is now 17 years old and is a vital earning member of his household. He works as a rickshaw-van puller to sustain his family. He is also a member of BRAC ADP club. But he is always concerned that rickshaw-van pulling is not a socially dignified occupation. He has always wanted to be a farmer, following his father's footsteps. In fact, he had been thinking of starting rice cultivation by mortgaging-in some land. In the meantime, as an ADP club member, he received the skill development training on three climate resilient agricultural technologies. Participation in this training rekindled his dream of being engaged with farming activities. He thought that all the technologies were good. But being landless, he preferred initiating compost preparation as his family already had a cow.

He started thinking of ways to ensure proper utilisation of his prepared compost and involvement



Rubel Das
with his
family
members

of his mother and his two younger brothers to help him. Considering his household context and feasibility, vegetable cultivation has seemed like a good choice to him as it could generate better returns than other crops and ensure proper use of the compost. He has also discussed with his mother about the plan. As of now, he is planning to take loans from an MFI and use that for taking mortgage-in land where he will grow vegetables. He and his other family members will work together on this venture to reduce cost and earn more.

5.2.9 Some limitations of the intervention

Many of the respondents were not clear about the information on OFSP cultivation provided in training session. In particular, they were not sure whether cultivation procedure of OFSP or of traditional sweet potato was described in the training. Some of them could not differentiate OFSP from traditional sweet potato. The unavailability of OFSP in those areas was one of the major problems in this regard. It also created problems for those who were interested in cultivating OFSP. From the training session they could know about the usefulness of OFSP, but did not get any information about how/from where they could get the vines. Therefore, some of them just tried cultivating traditional sweet potato instead of OFSP. One adolescent girl, Alfa, from Paikgacha said,

After getting training on sweet potato cultivation, I tried with the traditional variety, mostly because OFSP is not available in my locality. I thought all were same. I also did not get any explicit information regarding how I could get the vine of OFSP. I tried to manage it using my personal contacts; but I failed. I wish, since BRAC gave me training, they might help me to get the vine of OFSP as well.

In all the FGDs and IDIs conducted in the different study sites, almost all of the respondents apprised that they had been trained very intensively with practical demonstration in training sessions. However, a few of them opined that they could learn better if the training sessions were prolonged. In this regard, a field staff of ADP from the study area, who coordinated the arrangement of the training sessions and attended almost all sessions, said the following-

I think the training was fantastic. But one concern was that they [trainers] tried to explain a lot of things in a short time. I was not sure whether the adolescents could absorb the messages and knowledge on the three different technologies simultaneously in such a short time. The absorbing capability of the adolescents were not same. But the trainers were highly skilled. They taught very well, and also demonstrated efficiently how to use those technologies.

CHAPTER SIX

CONCLUDING SUMMARY AND RECOMMENDATIONS

This study draws on both quantitative and qualitative data. Descriptive and inferential techniques were used to analyse quantitative data. ANCOVA regression technique was used to estimate the impact of the intervention on selected outcome variables. To get qualitative findings, grounded theory approach was followed after triangulation and cross-checking of qualitative data.

6.1 QUANTITATIVE FINDINGS

Based on the baseline quantitative data, it was found that both the treatment and control groups were well balanced at the pre-intervention period in terms of different socio-economic and demographic characteristics, and key outcome variables. During the follow-up survey, nine respondents out of 200 were not possible to interview who were interviewed at the baseline survey. Thus, sampling attrition rate became 4.5 per cent. However, it did not bias the impact estimates, as the attrition rates were almost similar in both the treatment and control groups and did not follow any systematic pattern. The main reasons of sample attrition were absence of the respondents, migration and marriage.

Around 92 per cent of the targeted ADP club members from 25 treatment clubs participated in the intervention. Most of the participants (93 per cent) reported that the training activities under the intervention was effective for them. However, some pointed out a few shortcomings such as- shorter duration of the training, limited availability of necessary raw materials in their locality, lower engagement of the parents, financial constraints, and so on. The training booklet was properly conserved by majority of the participant adolescents.

Among 88 training participants, 15 (around 17 per cent) had already applied their newly developed skills to develop alternative climate adaptive livelihoods and generate income. Among these 15 participants, nine participants used owned cultivable land

for fish feed preparation, composting and orange fleshed sweet potato cultivation. Besides access to land and other necessary resources, many other factors were supportive for application of the new skills by the participant adolescents such as, interest of other members of adolescent's household, potentiality of supplying necessary production factors and food items for households. On the other hand, adolescents were challenged by financial constraints, unavailability of necessary inputs, and lower demand of the produces, while trying to apply the skills for income generation.

ITT estimates using ANCOVA regression technique showed that the intervention significantly increased technological knowledge by 21.22 point (around 47 per cent) of the participants or treatment group, compared to the non-participants or control group. The intervention also significantly increased (by 2.81 hours/week) time spending for income generating activities by the participants. In addition, in treatment group leisure time was reduced significantly (by 6.45 hours/week, compared to the control group). However, the intervention did not have any significant impact on other key outcome indicators such as-adolescents' entrepreneurial ability, and hours spent for schooling, household chores and club activities. However, point estimates suggest that compared to the non-participants, the intervention increased the participant adolescents' entrepreneurial ability by 0.11 point, and weekly hours of schooling and club activities by 2.23 hour and 0.77 hour, respectively. In addition, the intervention reduced time spending for household chores by 1.30 hours per week. Impact on income was not estimated as no participant could generate any income within the short 1.5 month-long post-intervention period. In passing, no significant impact heterogeneity was observed across adolescents' sex in-terms of ITT estimates.

According to the participant adolescents' opinion, BRAC needs to support them by providing necessary financial assistance and inputs, regular supervision and/or monitoring, and engaging parents and local people to strengthen the application of newly gained skills for developing their livelihoods and generate income.

6.1.1 Qualitative findings

Qualitative findings reveal positive perception of the participant adolescents regarding knowledge and skills gained from the training. They expressed their confidence and satisfaction with the training and most of them stated that they found the session intensive and full of practical demonstrations. Most of the respondents could explain all the three trades, on which they were trained, in detail. However, a few of the participants opined that the duration of the session was inadequate.

Changes were observed in the adolescents' attitude, ability to make realistic future plans and to take effective actions for implementing such plans, following participation in the training. They were found to think and work hard to explore potential ways of applying their newly gained skills and knowledge, mostly in the sphere of respective household's farming activities. They rationalised their ideas as per their households' context and also demonstrated their skills to their household members. They

conducted these demonstrations keeping in mind that once their neighbours get to know about these, it would create demand for their produces and expand their marketing opportunities. In some cases, the training participants were found to use their kinship relation and social network to materialise their plans and ideas.

An interesting change was observed in the views of adolescent girls regarding their scope of contributing to their household income. To be specific, the training encouraged the participant girls to be engaged with agricultural activities and contribute to their household income through that.

It emerged from the qualitative observation that the time gap between providing the training and conducting impact assessment survey was too short for the adolescents to generate income by implementing their newly gained knowledge and skill. Nevertheless, many of them were found to have initiated applying these skills to their household's farming activities, and thus initially contributed in reducing production costs for their respective households.

6.2 RECOMMENDATIONS

In conclusion, the results are supportive to continue and scale up the project. However, accommodation of the following recommendations may bolster the impact realisation.

- ▶ BRAC should revise the inclusion criteria related to household's monthly income. Monthly household income of both the participants and the non-participants was found to be more than BDT 10,000. However, according to the inclusion criteria used, monthly household income of an eligible adolescent should not be more than BDT 5,000, which is hard to meet in present economic condition of Bangladesh.
- ▶ Since the technologies on which the participants are trained are related to agriculture, the main target should be the adolescents from the farm households.
- ▶ Cooperation and follow-up mechanism among the frontline workers of the concerned programmes (ADP, AFSP and MF) is crucial to be ensured for realising better impact.
- ▶ Involvement of household members and mass people awareness about the economic benefits of the offered skills is needed to be increased.
- ▶ BRAC MF may supply start-up capital for the adolescents.

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About

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