Chronic Poverty Advisory Network

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Sustaining escapes from ultra-poverty: A mixed methods assessment of layered interventions in coastal Bangladesh

Working paper

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July 2022

brac institute of governance & development

data analysis and technical assistance limited

ODI

World Vision

Contents

Acknowledgements

This research was developed by the Chronic Poverty Advisory Network (CPAN, which at the time of research was hosted at the ODI, but since then has transitioned to the Institute of Development Studies), and the BRAC Institute of Governance and Development (BIGD). It was supported by World Vision. The authors are grateful to Lopita Huq (BIGD) and the wider qualitative data field research team for wonderful data collection and coordination, and to Data Analysis and Technical Assistance (DATA) for expertly collecting the quantitative survey data, and to the Nobo Jatra implementation team including Alex Bekunda, Saeqah Kabir, Md. Asaduzzaman, Ranak Mohanta, and Mehzabin Rupa for kind support throughout the process of data collection.

The authors are also very appreciative of feedback from Lucia da Corta (ODI), Andrew Shepherd (ODI), Joe Devine (University of Bath), Alex Bekunda (World Vision), and Saeqah Kabir, who all provided insightful comments on an earlier draft of the paper. The authors' views expressed in this publication do not necessarily reflect the views of CPAN, BIGD, DATA, or World Vision. The authors take full responsibility for any unintentional errors.

Acronyms

AAAT	Adapt, Anticipate, Absorb, Transform
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
FGD	focus group discussion
iMSD	inclusive Market Systems Development
KII	key informant interview
LSP	local service provider
NJP	Nobo Jatra Project
PPI	Probability of Poverty Index
RRAP	Risk Reduction Action Plan
SE	sustained escaper
TE	transitory escaper
TUP	Targeting the Ultra-Poor
UPG	Ultra Poor Graduation
VSL	Village Saving and Loan
VSLA	Village Saving and Loan Association
WASH	Water, Sanitation and Hygiene

Executive Summary

Bangladesh has seen its poverty rate, the proportion of people living on less than USD1.90 a day, reduce drastically, from 34.2% in 2000 to 6.6% by 2019. However, households who have escaped poverty remain vulnerable to re-impoverishment, and there are still people in the country living in ultra-poverty marked by limited capabilities and assets. Studies suggest impoverishment in the country has been driven by climate-change related shocks, ill-health and healthcare expenses, poor access to agricultural markets and services, and more recently, by the COVID-19 pandemic. Multi-sectoral programmes have the potential to address these challenges.

This research explores the potential of multi-sectoral integration and layering of the Ultra Poor Graduation (UPG) programming combined with inclusive Market Systems Development (iMSD); climate-related Disaster Risk Reduction (DRR); and Water, Sanitation and Hygiene (WASH) interventions to enhance individual and community level resilience capacities and prevent re-entry of participants of the UPG programme into poverty. We examined this potential in south-west Bangladesh basing on the Nobo Jatra Project (NJP)[1], a Resilience and Food Security Activity (2015-2022) funded by USAID and implemented by a consortium of NGOs led by World Vision. We used a mixed methods research approach to examine and compare wellbeing and resilience indicators among a sample of respondents of NJP exposed to different combinations of the interventions: UPG+iMSD, UPG+iMSD+DRR, UPG+ iMSD+WASH, and UPG+iMSD+DRR+WASH.

We conducted a cross-sectional quantitative household survey in December 2021, comprising a sample of 1,924 NJP participants. Survey modules covered participant demographics, asset ownership, incidence of poverty as measured by the Poverty Probability Index (PPI), perception of income change over the last five years, shock exposure and coping strategies, and engagement in NJP activities. The qualitative data consisted of key informant interviews, focus group discussions and life histories interviews conducted to provide an in-depth understanding of the participants experiences with the programme and resilience and poverty dynamics. Quantitative regression analysis, qualitative process tracing, and mixed methods data triangulation were adopted to examine whether and how wellbeing and resilience capacities vary across the study groups (UPG+iMSD, UPG+iMSD+DRR, UPG+ iMSD+WASH, and UPG+iMSD+DRR+WASH).

The study set out to test three hypotheses which have been used to organize the key findings and programming recommendations presented below. The recommendations relate to NJP layering and more general multi-sectoral programme design.

Hypothesis 1: Participation in UPG programme with iMSD is associated with absorptive and adaptive resilience capacity development to tackle chronic poverty.

Key finding: The results show that participation in the UPG programme with iMSD is associated with the development of absorptive and adaptive capacities that can tackle chronic poverty. UPG livelihood interventions involving activities such as coaching, business development training and entrepreneurship built up resilience capacities to absorb and adapt to shocks and stressors through enabling diversified livelihoods, knowledge of and improved access to high yield crops, productive or protective livestock rearing practices; and providing market links. In turn, these resources have been associated with pathways out of chronic poverty in the qualitative data and a higher probability of income increases in the quantitative data. On the latter, UPG activities were associated with a higher probability of perception of income increase, by 17 percentage points among households self-

[1] https://www.wvb-nobojatra.org/

reporting participation through access to extension services, and up to 43 percentage points for participation in business development activities.

However, qualitative results indicate that such programming can put too many demands and expectations on people in poverty with limited resources and abilities, including time for trainings and ability to absorb and adopt the range of teachings. Many of the poorest participants in the qualitative data report not being able to absorb some of the teaching, largely on account of low levels of education and poor health, coupled with limited physical infrastructure, such as the space needed to engage in vegetable farming.

Recommendations/ summary implications

- **The results suggest it is a best practice for the design of poverty eradication programmes to adopt integrated and inclusive livelihoods strengthening approaches.** Drivers of poverty are uniquely multidimensional and gendered among people in ultra-poverty.
- **NJP's coaching element is valuable for livelihood development** and could continue to develop by assigning mentors to individuals and households to work through constraints together (flexibly and tailored, outside of the scheduled group coaching) and monitor it post-training. A key question is how long the mentorship can be sustained, in which case working with local mentors, such as a successful participant in the village, may enable longer-term sustained improvements.

Hypothesis 2: Disaster Risk Management (DRM) training and mobilization and access to WASH services contribute to improving absorptive and anticipatory resilience capacities.

Key finding: Strengthening resilience capacities to anticipate and absorb disaster and health shocks may prevent household from falling back or deeper into ultra-poverty. The quantitative results show that participation in DRR training and receiving information about stress/disaster early warning signals is associated with a lower probability (19 percentage points) of income loss. The qualitative data suggests that increased awareness and access to information about risks was an important anticipatory capacity. Quantitative results, furthermore, point to access to WASH being associated with a lower probability (by 37 percentage points) of income loss, though qualitative insights highlight that it remains, on its own, inadequate in guarding against varied sources of ill health.

Results also suggested that some of the livelihood changes in response to the effects of climate change have inadvertently contributed to its own forms of insecurity (i.e. negative coping strategies). **There are reported cases of people shifting away from farming towards more insecure occupations, e.g. working in brick kilns as low-paid day labourers,** an occupation which is less viable for women; they report harassment, and reputational harm. There has also been increased reliance on saltwater fish farming due to increased water salinity, but fish farming has been in areas/ways that expose the ponds to flooding and fish escaping. Moreover, while many respondents were able to escape ultra-poverty through livestock development, there were continued challenges of DRR in the context of flood-related livestock deaths and widely prevalent livestock disease, despite improved veterinary support services.

Recommendations/ summary implications

- **Better targeting of ill health as a source of impoverishment is critical**. Respondents highlighted the importance of WASH in limiting certain forms of ill health. Additionally, linkages to quality healthcare free at the point of delivery remain relevant in preventing this key driver of continued impoverishment in rural Bangladesh. Within this effort, home visits from health professionals or doctors' referrals could help address a wider variety of ill health among people in ultra-poverty.
- **DRM responses could also be further expanded to focus on livestock amid floods and cyclones**. Responses include livestock insurance and access to shelters for livestock during disasters. Moreover, it remains critical to maintaining service delivery amid crises.

Hypothesis 3: Social and behavioural change components in WASH and women's gender equality and empowerment can help support sustained escapes from poverty.

Key finding: Transformative actions such as women empowerment, access to markets, participation in savings groups, and social networks improves women's ability to sustain escapes from poverty. Results indicate that women who make major household decisions on their own or jointly with spouses have a higher probability (by 29 percentage points) of an increase in their incomes. Furthermore, when women join community savings groups and have access to funds, they are also more likely to experience an increase in their income. Membership in savings/credit groups is associated with a higher probability (44 percentage points) that the household experienced an increase in their incomes in the five years preceding the survey.

At the same time, there continued to be contextual challenges to women's engagement in public spheres. For example, some respondents noted adverse gender norms that discouraged some women from participating in the NJP and/or in limiting women's freedom of movement outside the household. Challenges to group participation in activities were also accentuated during COVID-19. For example, in some cases VSLs had disbursed during the pandemic, and not all group members re-joined the savings groups upon their re-initiation.

Recommendations/ summary implications

- **Activities to strengthen women's economic empowerment needs to be designed sensitively**. For women participation in the NJP, support from husbands and mothers-in-law was critical. The NJP implemented a constructive male engagement activity to promote gender equality; however in this context, scaling up this activity within the UPG programme and complementing it with a negotiated approach to norm change that engages with husbands as well as mothers-in-laws, and also local and religious leaders more broadly within the community is critical for sustaining women's empowerment in contextually relevant ways.
- **There are other factors observed in Bangladesh that can enable sustained poverty escapes that could be considered in systems framing**, which are beyond the scope of any one programme and instead require coordination. This includes intra-household collaboration (beyond spousal collaboration), a financial inclusion ladder (e.g., access to favorable finance), upgraded business development skills, children's education, minimum wage rises, improved conditions for migrants, and a pro-poor growth environment. These are also observed to be important in Bangladesh in terms of enabling sustained escapes from poverty.

1. Introduction

Bangladesh has seen its poverty rate, the proportion of people living on less than USD1.90 a day, reduce drastically over the decades, from 34.2% in 2000 to 6.6% by 2019 (PovcalNet, 2021). Poverty reduction has been driven partly by agricultural growth, increased remittances (including women's internal migration to garment factories), and the strong export-oriented garment sector (Hill and Genoni, 2019; Andrews et al., 2021; Zhang et al., 2013). GDP growth averaged 3.9% yearly between 2000 and 2009, and 5.2% over the last decade (authors' analysis based on WDI, 2021). In addition, the country has been ranked high on progress in its human development metrics, placed sixth globally based on improvements made between 2014 and 2019 (UNDP, 2020). These developments have been driven by government programming and donor support in human development, especially health and education (Andrews et al., 2021).

However, the rate of poverty reduction has been slowing (Titumir, 2021; Rahman and Hill, 2019). There are also people continuing to live in ultra-poverty, marked by limited capabilities and assets, inadequate rights and entitlements, and heightened levels of vulnerability and uncertainty (Matin et al., 2008; Marsden, 2011; Maitrot et al., 2021). In other cases, households who have escaped poverty remain vulnerable to re-impoverishment. For example, a study of poverty dynamics in rural Bangladesh between 1997 and 2010 pointed to 14% of households either falling into poverty or experiencing only a transitory escape from it (Scott and Diwakar, 2016). More recently, analyses suggest that as much as 1.6 million people may have been pushed into poverty by 2021 because of the COVID-19 pandemic (Tateno and Zoundi, 2021). Besides COVID-19, the major reasons propelling impoverishment in the country over the last two decades have been established broadly as climate-change-related shocks and disasters; ill-health and healthcare expenses; food price increases and volatility; difficulties in loan repayments; poor access to agricultural markets and services; and social shocks, including deaths of an earning family member, land and dowry disputes, physical insecurity, and limited education and limited job opportunities (Hossain and Nargis, 2010; Davis, 2011; Diwakar et al., 2018; Diwakar, 2017; Quisumbing, 2011).

To address such challenges and get to zero poverty, might require pro-poor policies and multi-sectoral programmes that tackle persistent (or chronic) poverty, prevent households from falling into poverty (i.e., becoming 'impoverished'), and ensure that they remain out of poverty after escaping it (i.e., sustaining poverty escapes) (Shepherd et al., 2014). However, there is still a lot to learn with regards to the effective multi-sectoral programmes, best practices for coordinating their delivery, and how interventions interact and achieve synergy, as well as the impacts among the poorest populations—people in 'ultra-poverty'.

The UPG programmes, which target people living in ultra-poverty, are multi-faceted interventions with their origins in Bangladesh. They have become popular with donors as effective interventions for moving people out of ultra-poverty based on evidence from independent evaluations of programmes in different low-income country contexts (Banerjee et al., 2015; Andrews et al., 2021; Raza et al., 2012; Misha et al., 2019; Emran et al., 2014; Robano and Smith, 2013; Banerjee et al., 2015). By design, UPG programmes provide a bundle of services/support, including food, cash and or assets, and coaching to participants to give them a 'big-push' for self-employment. However, some studies show impacts of UPG programmes are not large enough or sustainable for many clients (Misha et al. 2019; Kidd and Athias, 2019). Participants are often left hovering around the poverty line and remain vulnerable to falling back into poverty, even in the event of minor or predictable shocks like sessional or cyclical stressors. Further, research on economic inclusion programmes, generally find that in *absolute* terms, the poorest and most vulnerable tend to experience the fewest gains (Andrews et al., 2021; Bandiera et al., 2017).

This research explores the potential of layering the Ultra Poor Graduation (UPG) programme with the inclusive Market Systems Development (iMSD), climate-related Disaster Risk Reduction (DRR), and Water, Sanitation and Hygiene (WASH) interventions to enhance individual and household level resilience capacities and prevent re-entry of participants into poverty in the face of health and climate related shocks and stressors on livelihoods in Bangladesh. We hypothesise that adding a DRR intervention to a UPG programme might be important to safeguard livelihoods and gains from UPG against major risks and re-impoverishment of those who recently escaped poverty. Also, we hypothesise that access to WASH services reduces certain forms of ill health, and promote wellbeing through ensuring sustainable, safe, and equitable access to water for human use. Finally, another critical challenge highlighted among people in ultra-poverty, including in Bangladesh, is the limited access to and integration of people in ultra-poverty into the agricultural market systems (Self et al., 2018) that can provide access to opportunities for increasing incomes, food security and resilience.

The research study seeks answers to two questions:

1. How and to what extent, if at all, does the layering of UPG with market systems, DRR, and WASH services impact households' resilience and sustainable escapes from extreme poverty amid health and climate-related shocks and risks?
2. What WASH and DRR specific interventions (or services) are associated with improved resilience capacities? How do these relate to broader resilience capacities contributing to poverty escapes among people in ultra poverty, and to limiting impoverishment in rural Bangladesh?

We address these questions in Bangladesh in the Nobo Jatra ('New Beginning') Project (NJP)[2], which is a seven-year (2015-2022) USAID Bureau of Humanitarian Assistance funded Resilience Food Security Activity (RFSA). The project was in its sixth year at the time of collection of primary data for the study in December 2021. The RFSA is implemented by a consortium of organisations: World Vision Bangladesh (prime), Winrock International, and local partners. The programme was designed to strengthen gender equitable food security, nutrition, and resilience of 856,116 poor and extreme poor participants in Shyamnagar, Kaliganj, Koyra and Dacope sub districts in southwest Bangladesh. NJP's UPG component aimed to graduate 21,000 households out of ultra-poverty in three cohort groups: 7,000 participants in the first cohort graduated by June 2019, the second cohort participants graduated by March 2020, and the third cohort completed 18 months in the UPG programme by September 2020.

The cross-sectoral layering and sequencing of UPG with iMSD, DRR, and WASH services within NJP makes the programme ideal for understanding the potential of multi-sectoral layering in sustaining graduation outcomes and escapes from poverty. We controlled for the variation of graduation schedules across the three cohorts and examined the exposure of the population to multi-hazard risks (including the COVID-19 lockdown and the Cyclone Amphan shocks) to understand if escapes from ultra-poverty are being sustained. Results confirm that layering DRR and WASH interventions on to UPG programme improves programme members' wellbeing and enhances their resilience to shocks through capacity building, and also offers the potential to contribute to progressive social change.

The next section presents a summary of recent literature on poverty and resilience in Bangladesh. In turn, this review is used to introduce a conceptual framework that merges a resilience framing (see Box 1 for definitions) with a poverty dynamics lens.

[2] https://www.wvb-nobojatra.org/

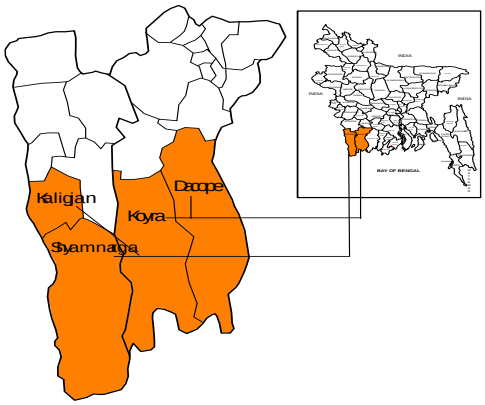
2. Overview of poverty dynamics and resilience

2.1 Study programme description

Whereas BRAC type graduation interventions focus primarily on supporting individuals and households, Nobo Jatra's UPG programme uniquely layers on 'community wide' preventive interventions such as WASH and DRR.[3] It also more strongly focuses on engagement with local service providers than the typical BRAC approach, which is an important part of its layered approach.

'Nobo Jatra-New Beginning' is a seven-year USAID activity that seeks to improve gender equitable food security, nutrition, and resilience in southwest Bangladesh—in Dacope and Koyra Upazilas in Khulna and Shyamnagar and Kaliganj Upazilas in Satkhira. World Vision Bangladesh, together with the World Food Programme, Winrock International and 3 local partner NGOs, undertook the project in September 2015, in partnership with the Ministry of Disaster Management and Relief of the Government of Bangladesh.

Figure 1: Nobo Jatra programme area



The NJP graduation programme delivers a sequence of targeted interventions that aim to graduate 21,000 extremely poor households from fragile income sources to sustainable, diverse livelihoods. This approach focuses on ensuring that people can move and stay out of poverty. To achieve this, the programme implemented its enhanced version of the UPG model and targeted women as the direct participants at the household level with multi-sectoral interventions in WASH, agriculture, and alternative livelihoods (related to iMSD), DRR, Maternal and Child Health and Nutrition (MCHN), good governance and social accountability, and gender. An outline of the specific activities under these interventions is summarised assessment (see Table 1). A graphic demonstration of the layering and sequencing of the interventions is illustrated in Annex A.

Table 1 Focus of intervention areas in the present study assessment

Intervention	Activities
UPG *(all women participants)*	· Entrepreneurial literacy training- basic literacy/ numeracy, core business skills. · Cash transfers of $12 per month for nine months (monthly allowance). · IGA training- relevant to skills and context. · Cash grant of $188 for asset development (e.g., start-up capital for enterprises), shared as a mobile transfer. · Village Saving and Loan Association (VSLA)- savings group with active savings account in formal financial institution. · Intensive coaching, mentoring, and following up during the programme period. There was a sequence to these activities, where participants started with entrepreneurial literacy training and a monthly subsistence allowance, followed by IGA business planning and training, then a cash grant transfer, followed by savings group development, and engagement in producer groups.

[3] In more recent years, BRAC has been revising its strategy, for example to link participants to WASH services and include some sites in regions affected by climate change to raise awareness on disaster preparedness (Andrews et al., 2021). Even so, these activities are on a smaller scale than the breadth of community engagement interventions within the NJP.

iMSD	· Entrepreneurial literacy training – enterprise development (almost 100% women). · Climate smart agriculture – lead farmers manage plots and generate demand. · Capacity building for local service providers (LSPs) in the community – agricultural advisors to producer groups, the private sector and government service providers. · Link smallholders to extension services LSPs), agro-vets input suppliers and buyers. · Linkages with lead firms for both crop and livestock services (inputs).
DRR	· Youth mobilisation in the community – Risk Reduction Action Plan (RRAP) development, training to the other groups, orienting local communities. · Community mobilization and training/sensitization – household level preparedness. · VDC mobilization – DRR activities, links with other groups, oversight of RRAP. · Disaster Management Committee training- including appraisal tools beyond NJP.
WASH	· WatSan committees (50% female) – plan, monitor, report on WASH progress. · Social and behavior change – messaging on baby WASH, handwashing, safe drinking water, water treatment, waste fecal management, latrine maintenance, exclusive breastfeeding, antenatal care, and nutrition. · Access to water and sanitation facilities, including their infrastructure development.

Source: Nobo Jatra Project Brief; Barkat et al. (2019).

2.2 Conceptual framing: Linking resilience and poverty dynamics

The analysis is framed in the context of 'development resilience', defined as 'the capacity over time of a person, household, or other aggregate unit to avoid poverty in the face of various stressors and in the wake of myriad shocks. Only if that capacity is and remains high over time is the unit resilient (Barrett and Constas, 2014). In this study we examine adaptive, anticipatory, absorptive, and transformative capacities, hereafter the AAAT framework of resilience (see Box 2 for definitions). We do this to examine the factors that can help prevent impoverishment and reduce reliance on erosive coping strategies in the face of shocks and stressors.

Box 2: Definitions of resilience capacities and extended for this analysis

- ***Absorb**: 'ability of social systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters'*
- ***Anticipatory**: 'ability of social systems to anticipate and reduce the impact of climate variability and extremes through preparedness and planning'*
- ***Adapt**: 'ability of social systems to adapt to multiple, long-term and future climate change risks, and also to learn and adjust after a disaster'*
- ***Transform**: 'pertains to the holistic and fundamental ways in which people's capacity to adapt to, anticipate and absorb shocks can be built, reshaped and enhanced' – strategic thinking and policy, leadership, empowerment and innovation, catalytic, impact at scale (which in our analysis we also take to include community and state levels), sustainable outcomes*

Source: Bahadur et al., 2015

We adapt the AAAT framework beyond community or system-level responses to DRR, to focus additionally and more explicitly on people at the individual and household levels and draw attention to the shocks experienced by individuals and communities in Bangladesh. For example, around absorptive capacities, we expand this to include other shocks and stresses such as individual shocks with respect to health, divorce, and livelihood failures, and stressors such as increasing dependency ratios without adequate support, adverse gender norms (e.g., through backlash), limited mobility hampering work activities, and perceptions of loss of dignity associated with certain forms of work. Similarly, anticipatory and adaptive capacities are extended to apply in response to other shocks and

stressors. Around transformative capacities, we also take this to include the fundamental ways in which community and state level capacities can be built, reshaped, and enhanced.

This focus on multiple levels of analysis stems from a recognition that while systems must work together for DRR, individuals and wider social systems do not always work together and can work against each other or even cause individual shocks and the social exclusion of people in ultra-poverty. On the other hand, combinations of resilience capacities can offer the potential to enhance people's wellbeing. Resilience capacity combinations in Bangladesh often include access to physical and financial assets, insurance services, developing human capital, and strong social network and social safety nets (Hoque et. Al., 2019; Moore et al., 2019), only some elements of which are present in the NJP. A review of a range of resilience capacities in Bangladesh is summarised in Table 2.

Table 2 Examples of key resilience capacities identified in Bangladesh

Absorptive and anticipatory	*Adaptive*	*Transformative*
Absorptive · Weather-indexed insurance · Financial support net · Usage of loan · Number of community organisations acting as informal safety nets · Asset base, and ability to substitute one major asset with another one · Proportion of wealth in cash and dietary diversity · Farmer collectives · Government relief (including cash and in-kind transfers), livelihood assistance, and reconstructing/ developing infrastructure and services · Disaster information-based database to strengthen policies and accountability Anticipatory · Access to risk information, climate weather forecasting · Development and usage of effective early warning signs, increasing institutional capacity on community level · Pre-identification of families at risk · Forecast-based early action	· Agricultural adaptation: e.g., adjust planning dates, adopt new crops, rear livestock · Introduction of new crops and production systems · Leveraging value chains and market links · Alternative livelihoods and off-farm diversification · Infrastructure development, including irrigation · Technological advancement · Ownership and quality of assets and amenities · Investing in research and development · Access to financial support · Encouraging private sector players to invest in low-income markets · Ecosystem management and policy development · Community-based adaptation: e.g., tidal river management and climate risks management · Migration: internal or international, seasonal · Female work participation, collaborative spousal relations · Higher density of healthcare services	· Technological innovations and structural change, e.g., to service people in poverty · Enhanced income-earning opportunities, training, and credit for people in poverty · Greater equitable access to water, land (and land tenure), capital · Enhanced access to services: markets, loans, extension services, financial and insurance services · Strong social network and safety nets: formal and informal, monetary and non-monetary support · Improved socio-cultural norms and practices in favor of gender equality, altering existing power relations · Addressing institutional discrimination · Legal and political awareness and institutional function · Enhanced participation of marginalised people in project committees and forums · Combinations: e.g., health interventions with disaster risk management

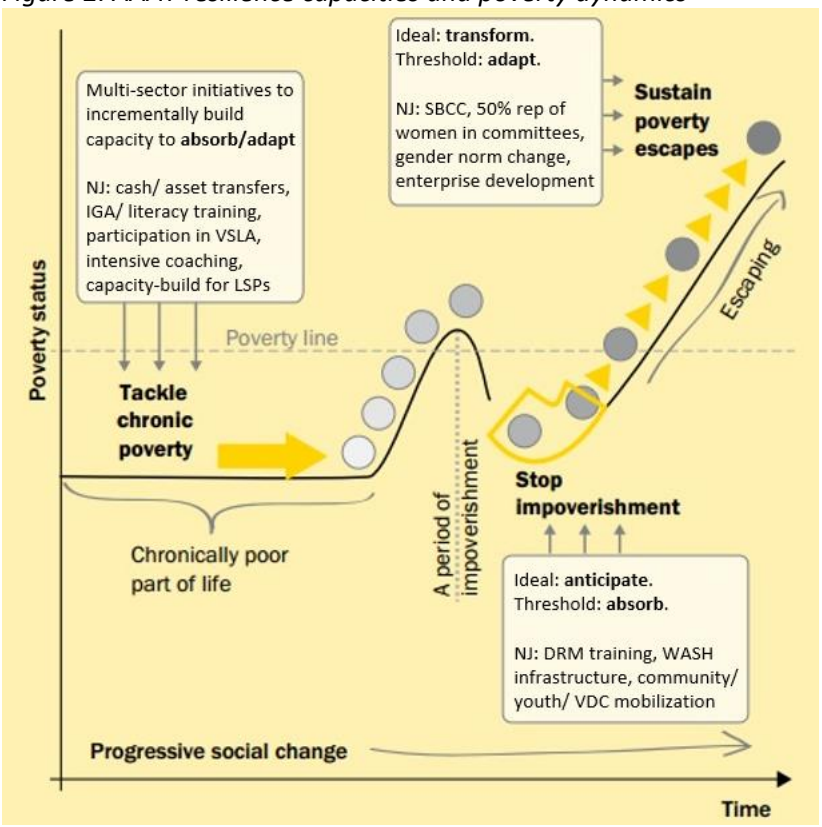
Source: based on rapid review of literature on resilience and poverty in Bangladesh – e.g., Ahmed et al., 2016a, 2016b; Gradl et al., 2013; Alam and Rahman, 2019; Hoque et. Al., 2019; Moore et al., 2019; Ayeb-Karlsson et al., 2016; Akter and Mallick, 2013; Sultana et al., 2020; Cash et al., 2013; Choularton, 2021; Hossain et al., 2018; Islam and Nursey-Bray, 2017; Islam et al., 2017; Sarker et al., 2020; Kabir et al., 2017; Kamal et al., 2018; Kundu et al., 2020; Mottaleb et al., 2013; Ray-Bennet et al., 2010; Roy et al., 2015; Scott and Diwakar, 2016; Skakun et al., 2021; Mallick et al., 2017; Thomalla et al., 2005; Uddin et al., 2014.

Although the term 'resilience' has its origins in engineering and has also been used extensively in climate and disaster risk management sectors, it has also been applied to poverty reduction (Diwakar and Shepherd, 2022). This offers the conceptual impetus to merge the poverty dynamics and AAAT frameworks more explicitly (Figure 2). Merging the poverty dynamics and AAAT frameworks is useful because it links the set of capacities that can reduce vulnerability and capacities that can enhance wellbeing over time in ways conducive to sustained escapes from poverty. For example, climate-weather forecasting (Table 2) can enable communities to better anticipate crises and take preventative measures to mitigate negative effects when they do strike—thus limiting impoverishment. We extend the AAAT framework to engage with multiple levels of analysis more

explicitly, from the individual, household, community, and wider institutions and systems that may affect wellbeing.

We adapt the poverty dynamics framework by Shepherd et al. (2014) to idealise in Figure 2 how the NJP interventions can contribute to strengthening resilience capacities to tackle chronic poverty, prevent impoverishment, and sustain poverty escapes, while the hypotheses below expand this discussion. While most ultra-poor programmes stop at UPG type programmes, NJP layers on iMSD, DRR and WASH. These are needed to improve the effectiveness of escapes from ultra-poverty, as articulated below.

Figure 2: AAAT resilience capacities and poverty dynamics



Source: Poverty dynamics from Shepherd et al. (2014), merged with NJP interventions and resilience capacities framing.

The hypotheses guiding the study derive from this conceptually merged framework, and are presented below, with further details outlined in the results section.

Hypothesis 1: Participation in UPG programme with iMSD is associated with absorptive and adaptive capacity development to tackle chronic poverty.

Tackling chronic poverty requires at a minimum addressing four cross-cutting policy pillars: social assistance, pro-poor economic growth, human development (and the rights/entitlements conferred around this) especially for those hardest to reach, and transformative social change (Shepherd et al., 2014). We hypothesise that NJP's UPG component offers a key package of integrated livelihood sectoral activities to help tackle chronic poverty by providing social assistance through cash transfers, pro-poor economic growth through livelihood diversification, human development through literacy training, and transformative social change through a cross-cutting focus on gender equality, amongst other things. The programme's activities including cash and asset transfers, financial literacy training,

coaching, and cross-cutting gender empowerment can combine to help address the four policy pillars noted above. In resilience language, UPG livelihood focused sectoral interventions combined with inclusive market systems development incrementally build up individual, household, and community capacities to absorb and adapt to shocks and stressors. For example, asset transfers can provide a source of liquidity in times of heightened distress that can help households cushion the negative impacts of shocks. Similarly, diversified livelihoods can help mitigate risk and provide multiple options that enable households to adapt to changing circumstances over time. These sequenced interventions, through their role in enhancing absorptive and adaptive resilience capabilities, may help in tackling chronic and ultra-poverty.

These intensive activity arms are important because people in ultra-poverty are different to other groups of people in poverty. They are likely to experience a lack of capabilities, limited labour power, much lower per capita expenditures, state of under-nutrition and chronic illness, low levels of education, experience of structural violence, weak relational networks, social and political exclusion, spatial remoteness, insufficient money for migration, and more generally heightened levels of uncertainty (Matin et al., 2008; Marsden, 2011; Maitrot et al., 2021; Altaf, 2019). They are traditionally excluded from many routes to upward mobility and have limited resilience capacities. Indeed, in some programmes in the country, participants who did not sustain graduation post-intervention were more likely to be older or women, with limited decision making and mobility, including around the operation of income-generating activities, literacy, and education, and consequently had fewer livelihood options available to them (Self et al., 2018; Altaf, 2019; Matin et al., 2008; Siddiquee, 2019). In this context, economic support was helpful in improving wellbeing for those experiencing poverty due to systemic factors, including exploitative relationships, but less effective for those experiencing poverty due to idiosyncratic, individual characteristics including chronic ill health and morbidity, old age, and abandonment (Devine and Wood, 2011). As such, they may require a more intensive, sequenced, and layered approach to their graduation to strengthen resilience capacities and ensure that escapes from poverty are sustained.

A focus on inclusive market system development is also relevant in Bangladesh, given problems linked to the market and associated price shocks that have perpetuated poverty. For example, food price shocks between 2007 and 2009 were observed to have adverse effects on food security for people in poverty, especially over the short term (Akter and Basher, 2014). Poor communities in the country have also had limited access to markets, especially in rural areas where government extension services and private sector involvement was somewhat limited. In addition, there are also gendered dynamics and social norms that might have limited mobility and autonomy, given that all UPG participants were women. Poverty is linked to this limited access and other systemic characteristics, including expropriation of productive assets and infra-subsistence wages (Devine and Wood, 2011). In this context, inclusive market systems development has the potential to help address this problem by ensuring the integration of people in poverty and marginalised groups who are often excluded or exploited (World Vision, 2022).

Hypothesis 2: DRM training and mobilisation, in combination with access to WASH, can contribute to improving absorptive and anticipatory resilience capacities.

Building resilience to guard against future poverty requires interventions that strengthen absorptive capacities at a minimum in the short-term, and anticipatory capacities as an ideal longer-term objective. Universal healthcare, savings, insurance against major risks, and disaster risk management are among the policies that can help safeguard against welfare descents (Shepherd et al., 2014). Given the importance of livestock in risk management, veterinary services would also be critical, as included in the NJP package of interventions related to iMSD. NJP's pillars on DRM and WASH offer preventative measures to help address two key sources of risk (disasters and ill health) that could otherwise

precipitate poverty descents. Though WASH does not directly address the range of ill health outcomes, its activities under the NJP do provide important infrastructure and services targeted to pregnant and lactating women and children that enable households to reduce their susceptibility to certain forms of ill health. Even so, while strengthening absorptive capacities to manage adverse conditions is important in helping prevent impoverishment, a more sustainable method is to strengthen anticipatory capacities through better preparedness and planning. Anticipatory, early action can improve the effectiveness of response efforts (Tanner et al., 2019). NJP interventions around DRM training and community mobilisation are hypothesised to strengthen household and community absorptive and anticipatory capacities to prepare for shocks and stressors, equipping them with the potential to mitigate their negative effects more effectively.

Again, these focus areas are relevant in rural Bangladesh. For example, improvements in water quality, handwashing, sanitation, or nutrition supported by intensive interpersonal communication were associated with improvements in cognitive, motor, and language development of children in a study in rural Bangladesh (Tofail et al., 2018). Potential mechanisms linking WASH to these outcomes include reduced infection/inflammation and improved maternal wellbeing combined with frequent visits and support from community health workers as part of the programme (Tofail et al., 2018). In addition, among char dwellers, key drivers of poverty were riverbank erosion, frequent floods, inadequate education opportunities, encroachment of char land, and livestock diseases (Sarker et al., 2015; Ahmed et al., 2016a), including in coastal areas (Adnan et al., 2020; Roy et al., 2015). At the same time, the relatively strong disaster risk management profile of Bangladesh and its flood response efforts, in particular, have meant that some scholars do not find flooding to negatively affect welfare (Quisumbing, 2011; Davis, 2011).

Hypothesis 3: Social and behavioural change components in WASH and women's gender equality and empowerment can help support sustained escapes from poverty.

The ability to adapt and transform goes beyond incremental change and can support pro-poor institutions and nurture sustained escapes from poverty and improved wellbeing over time. Indeed, sustaining escapes from poverty requires interventions including post-primary education with links to the labour market, land policy reforms, and progressive regional development policies (Shepherd et al., 2014). Many of these aspects enable resilience of structures, such as labour and potentially agricultural markets. At the micro level, individuals who can more easily and flexibly adapt to changing circumstances may also be better placed to respond to future risks and opportunities, and in the process ensure that they continue to enhance their wellbeing. For sustained improvements in wellbeing over the long-term, strengthening transformative capacities is also important. NJP's focus on aspects hypothesised to strengthen participant agency, such as delivering UPG to female participants for increased women's empowerment, as well as providing social and behavioural change alongside intensive coaching can offer the tools for individuals and households to strengthen their resilience. Supportive infrastructure, progressive social norms, and pro-poor policy can further contribute to an enabling environment that nurtures transformative change. These have been in place in Bangladesh, though they may have declined a bit during the pandemic.

3. Methods and data

Data—Quantitative

The quantitative data was collected from a sample of NJP participants. All respondents in our sample frame received the UPG and iMSD programme components. However, participation in DRR, and WASH

components was heterogeneous. There were three cohorts[4] of UPG programme participants in four rural upazilas in two districts of southern Bangladesh: Dacope and Koyra in Khulna and Shyamnagar and Kaliganj in Satkhira. Since all participants received both UPG and iMSD interventions, we use 'UPG' to refer to the 'UPG+iMSD' combination as the baseline or reference/control arm in our comparative analysis in the text that follows.

The sample of respondents was established following the simple, stratified random sampling approach. The sample frame was stratified into four strata, to represent the three treatment arms (UPG+DRR, UPG+WASH, UPG+DRR+WASH) and one control arm (UPG).There were also attempts to stratify the sample frame by cohort or time of participation or graduation from the UPG programme. As noted earlier, Nobo Jatra's UPG component programme graduated households in three cohort groups: 7,000 participants in June 2019, the second cohort participants by March 2020, and the third cohort by September 2020. We sampled by cohort across the intervention study groups as much as possible. However, respondents from cohort 1 and 2 could not sufficiently meet sample size requirements across the intervention study groups. Thus, during the survey data collection we drew additional respondents from cohort 3 to reach minimum sample requirements. Noteworthy, cohort 3 respondents might have harboured some systematic differences or contaminations relative to cohorts 1 and 2. These difference include (a) the possibility of contamination due to spill-over effects as cohort 3 participants came from the same villages as those in cohort 1 and 2, and so likely benefited from Nobo Jatra's earlier community-level interventions; (b) heterogeneity within cohort 3 because of some variation in interventions accessed;[5] and (c) there was too short of a post-intervention period in cohort 3 for our timeframe. Cohorts 1 and 2 began in 2017, while cohort 3 began in 2019, so each cohort has a variable post-implementation phase overlapping with the pandemic. We still utilized cohort 3 for comparative analysis but interpret the results with consideration of the possible contaminations noted above.

The quantitative data was collected through mobile phone-based surveys (rather than in-person) because of the travel and face-to-face meeting restrictions instituted by governments and health authorities to limit the spread of the COVID-19 virus, but also because of limited budget resources. Data was collected using Computer Assisted Telephone Interviewing (CATI) software in December 2021 by Data Analysis and Technical Assistance (DATA), an organisation specialising in survey data collection in Bangladesh. The phone survey covered 1,924 women, balanced across intervention arms. These women were interviewed using a semi-structured household questionnaire comprising modules with questions around demographics, asset ownership, financial inclusion, WASH activities, participation in community-based organisations, exposure to shocks and coping strategies, disaster risk reduction activities, and food security. Our analysis focused on assessing resilience capacities across the intervention groups and the extent to which respondents have experienced continued improvements in income, asset accumulation, and a reduced likelihood of poverty over time.

Data—Qualitative

Qualitative interviews were undertaken in person (with personal protective measures to control the spread of the COVID-19 virus) during December 2021. All names have been anonymised in this report. The purpose of the interviews was to understand in more depth the processes of integration linked to the study programmes that have influenced respondents' well-being status over time, especially remaining out of ultra-poverty. Data were collected by qualitative researchers at BRAC Institute of Governance and Development (BIGD), following ethics approvals by the ODI's and BIGD's Institutional

[4] Cohort 1 (May 2017 start date); cohort 2 (Dec 2017 start date); and cohort 3 (Mar 2019 start date)
[5] Cohort 3 was divided into three arms: 1) receiving 'standard' set of interventions, 2) receiving 'group' interventions, 3) receiving 'empowerment' interventions'

Review Boards. Though the qualitative data collection is limited, the methodological approach and analysis is detailed. Three villages of Kaliganj Upazila were selected for the qualitative interviews based on the presence of an adequate number of participants across intervention groups especially in cohorts 1 and 2 to align with the quantitative survey: Bazargram from Kushuliya union, Tarali from Tarali union and Paniya from Moutala Union. A summary of the study sites is provided in Annex B. In total, the following interviews were conducted, balanced across intervention arm as detailed in Annex B:

- 12 key informant interviews (KIIs) were conducted, including with World Vision staff, local service providers, Nobo Jatra facilitators, and village agents, along with local knowledgeable people.
- 9 focus group discussions (FGDs) were conducted: one female, one male, and one knowledgeable person FGD in each of the three villages, with representatives from different age and wealth groups and social classes.
- 35 life histories interviews were conducted with female Nobo Jatra programme participants and five with female non-participants from study areas with similar socioeconomic and demographic profiles to households in the study sites. Women were chosen because the Nobo Jatra UPG programme participants by design were all women. In all interviews, there was a particular focus on the last five years to allow for overlap with the project period. There were also a few short 15–20-minute interviews of post intervention experiences with the male spouse or eldest child (e.g., older son or daughter) for female headed households.

Gender-disaggregated FGDs were held to identify poverty dynamics of respondents (chronic poor – CP, transitory escapes from poverty – TE, and sustained escapes from poverty – SE), as well as resilience capacities, and how the Nobo Jatra programme might have influenced these dynamics in the area. FGDs were also used to understand changes in key factors at the household and community level. Additionally, national, local, and project-level KIIs were also conducted with NJP staff and service providers linked to study communities and activity interventions (e.g., veterinary service providers, input retailers, etc).

Interviews were conducted primarily with participants in interventions (UPG, iMSD, DRR, WASH) while there was also a smaller number of interviews with non-participants to understand whether similar progress has been achieved by non-participants and how/why. This allowed for comparisons between people who have received interventions and those who have not. Though this was a small sample, the expectation is that if these interviewees had a similar range of experiences, we might infer that the programme effects spilled over or may have been less effective than anticipated. Ultimately, only a small number of non-participants were interviewed since the main aim was to understand the sustained impacts of layered interventions beyond the baseline package of UPG and iMSD. The area and project level KIIs (in person and virtual) provided a basis for understanding implementation of integrated, multi-sectoral interventions and how they may be tailored to promote sustained poverty escapes. All names and identifiers of study participants have been anonymised in this report as noted earlier.

Data analysis strategies

Quantitative analysis

The quantitative analysis assessed the relationship and difference between exposure to the study interventions and wellbeing outcomes. The interventions were hypothesised to strengthen anticipatory, absorptive, adaptive, and transformative resilience[6] capacities of households. The study

[6] These resilience capacities include absorptive, anticipatory, adaptive, and transformative as defined in Box 1 and with examples provided in Table 2.

relied on four wellbeing indicators, identified by a) the asset index constructed using Multiple Correspondence Analysis[7]; b) incidence of poverty, assessed using the Probability of Poverty Index[8] (PPI) developed by the Innovations for Poverty Action (2020); c) the self-reported change in income in the five years preceding the survey before they joined the Nobo Jatra programme; and d) their experience of food insecurity assessed using the Household Food Insecurity Access Scale (HFIAS).[9]

Using these three wellbeing measurements, three regression models were estimated to analyse whether the wellbeing outcomes of respondents (measured through the wealth index), probability of being poor (measured through the PPI) and self-reported income change, varied across the three study groups (UPG+DRR; UPG+WASH; UPG+DRR+WASH) relative to the reference arm (UPG). In the regression model:

$$y_i = T_i\theta + X_i'\beta + \varepsilon_i \quad (1)$$

y_i is any of the two continuous wellbeing outcome variables mentioned above (probability of poverty, and asset wealth index) for individual i, and T_i represents the treatment group (thus individual participation in the layered interventions). The variable T_i' is categorical in nature, capturing four intervention groups as noted above (UPG, UPG+DRR, UPG+WASH, UPG+DRR+WASH), with the associations measured relative to the reference group of UPG (which is considered a base category). X_i' is a vector of correlates including other socioeconomic and demographic variables, and β and θ are scalars of coefficient to capture the correlation between dependent variables and independent variables. The measurement error or the error term ε_i is assumed to follow a normal distribution with mean 0 and standard deviation σ^2 and is also assumed to be independently and identically distributed (i.i.d). Equation (1) above is estimated as ordinary least squares (OLS).

The income change outcome variable was recorded to take values of 1 for a response of income increased and 0 for a response of no change or income decreased. The analysis employed a probit model to examine the relationships and differences, if any, across the study groups. The probit dichotomous model is specified as:

$$Pr(\rho_i = 1 \mid X) = F(X_i'\beta) \quad (2)$$

where $Pr(\rho_i = 1 \mid X)$ is the probability of a respondent saying that their income had increased or decreased given, or conditional on, a set of variables X. F is the functional form that is assumed to be a cumulative standard normal distribution.

Qualitative analysis

The qualitative data was analysed using NVivo software and direct content analysis, with a focus on programme activities as nodes of analysis. This was complemented with nodes for the life histories focused on resources, capacities, activities, and shocks and stressors common in the analysis of poverty dynamics (da Corta et al., 2021). Nodes were examined thematically in terms of the frequency of attributions overall, by intervention arm, and by poverty trajectory of the respondent. In addition,

[7] based on the presence of the following in a household: a radio, a television, a mobile phone, a computer, a fridge, a vehicle, a motorcycle, and a bicycle.

[8] The PPI provides scores to 10 questions used to compute the likelihood that the household would fall below a set poverty line. In this study, PPI scores were generated using region of residence; household size; number of children between 0 and 4 years; education of the head; availability of bicycle, fridge, and fan; electricity; construction materials of the house; toilet type and shared toilet.

[9] The HFIAS is a continuous measure of food insecurity, based on a 9-item scale with a month recall period, asking about the occurrence of food insecurity, measured in terms of respondent perceptions of food vulnerability and their behavioural responses to food insecurity.

process tracing methods were employed to understand key aspects of layering and sequences that enabled households to sustain escapes from poverty.

For coding the FGDs, we organised the topics thematically according to these nodes but also factors relating to perceptions of women's economic empowerment, social norm change, level of access or availability of services/resources, and the role of layering of Nobo Jatra's WASH, DRR, and iMSD over UPG interventions. These were analysed to assess their contributions to enhancing resilience capacities that can precipitate poverty escapes and limit poverty descents in the study area. Finally, the project level KIIs were analysed to draw attention to successes and challenges in implementation of activities, in addition to delivering insights into the existing state of health of key institutions and the existing and changing policy environment.

Triangulation of qualitative and quantitative data

We undertook integration and triangulation of our mixed methods data in ways that could balance breadth with depth and assess the interventions' relationships with enhancing resilience capacities. The quantitative analysis was revisited iteratively after the qualitative fieldwork. This analytical approach developed an integrated narrative based on the areas of agreement between the two streams of research and explored any significant areas of disagreement.

Key limitations of the proposed methodology included (a) an inability to generalise the findings from qualitative data to the small sample size of intervention participants overall, and the quantitative data findings to rural Bangladesh more broadly beyond the southwest study sites; (b) limited understanding of causality from the quantitative analysis through the regression analysis employed and cross-section study design; (c) a focus of qualitative results only on rural areas, based on Nobo Jatra's geographic focus; (d) a lack of panel data, which provides more accurate data about changes over the time rather than self-reported changes based on recall; and (e) limitations as to what information participant-focused survey data can elicit about implementor-level synergies—for example, relatively less understanding of the supply-side factors such as institutions, market functioning, and implementation of activities that could affect wellbeing, or in some cases biased responses given by respondents in the hope of not being excluded from future programmes.

The goal of the qualitative data was not to generalise but to offer important insights to disentangle the effect of interventions and into effective touchpoints for layering and sequencing within the multi-sectoral integration in ways that bridged project implementation with project participant perceptions and response outcomes. That is why there was a focus on key informant interviews with project implementors alongside focus groups and life histories. The quantitative analysis also permitted generalisability within programme participants, leaving implementor-level synergies and sequencing as a focus for the qualitative tools. While quasi-experimental designs in the quantitative analysis would have offered stronger claims of causality and represent an area for further research, we focused on simple regression modelling in the present paper to understand correlations and associations that were then interrogated in more depth in the qualitative data. Finally, data triangulation through the mixed methods approach, for example in terms of understanding the added benefits of DRR and WASH activities to UPG programming, enabled the breadth and depth to be balanced in a way that could offer useful policy and programming insights to improve sustained outcomes.

4. Results

4.1 Relationship between interventions and wellbeing

Descriptive statistics

Table 3 lists summary statistics of sociodemographic characteristics of the study sample, while a disaggregation by cohort is presented in Annex D. In the sample, three quarters of respondents were heads of their households, generally presiding over households with around four members. Linked to the high prevalence of female headship among this sample of NJP respondents, 96% reported making decisions on expenditures, either on their own or jointly with their spouse. Household heads were generally older than the mean across Bangladesh. A large share of these heads had no education (44%). The main livelihoods were informal employment, followed by agriculture and fisheries. Around one in five households (21%) also received remittances, even during the pandemic period when the data was being collected.

Table 3 Summary statistics of socio-demographic variables

Variable	Obs.	Mean	SD
% of households headed by women[10]	1914	0.75	0.44
Age of household head	1914	42.75	10.72
Household size	1924	3.98	1.57
% of household heads with no education	1924	0.44	0.50
% of household heads with primary education	1924	0.30	0.46
% of household heads with secondary and above	1924	0.27	0.44
% of households where women make decisions on expenditures on their own or jointly with spouse	1901	0.96	0.19
% of households that received remittances in 12 months preceding the survey	1924	0.21	0.40
% of heads whose primary income source is agriculture and fisheries at the time of the survey	1921	0.44	0.50
% of heads whose primary income source is business or informal employment at the time of the survey	1921	0.53	0.50
% of heads whose primary income source is formal employment at the time of the survey	1921	0.03	0.16

We next present a set of outcomes that is a focus of our analysis, disaggregated by intervention group. On average, the poverty likelihood was between 36-38% across intervention groups (Table 4). The **majority (72-81%) of sample households across intervention groups reported having experienced an increase in their income in the five years preceding the survey (Figure 3)**. On average, households were likely to not have their food needs met across four to five out of nine indicators of food insecurity. We also examine indicators related to WASH and DRR, for example access to improved water and sanitation facilities and preparedness actions for shocks. In terms of WASH infrastructure, access to improved sanitation was nearly universal among the sample (92–98%) across groups. Access to improved water sources was less prevalent, generally covering around a third of respondents (between 31-39%).

[10] Note that this is based on a sample where Nobo Jatra interventions were administered to women participants.

Figure 3 Subjective or reported income changes in the past five years by interventions

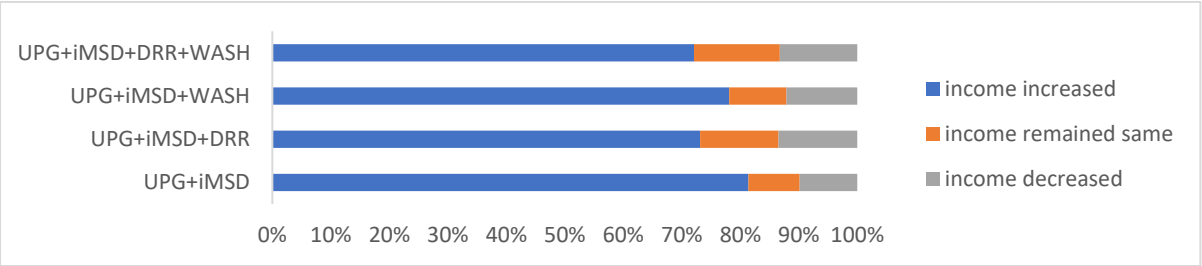
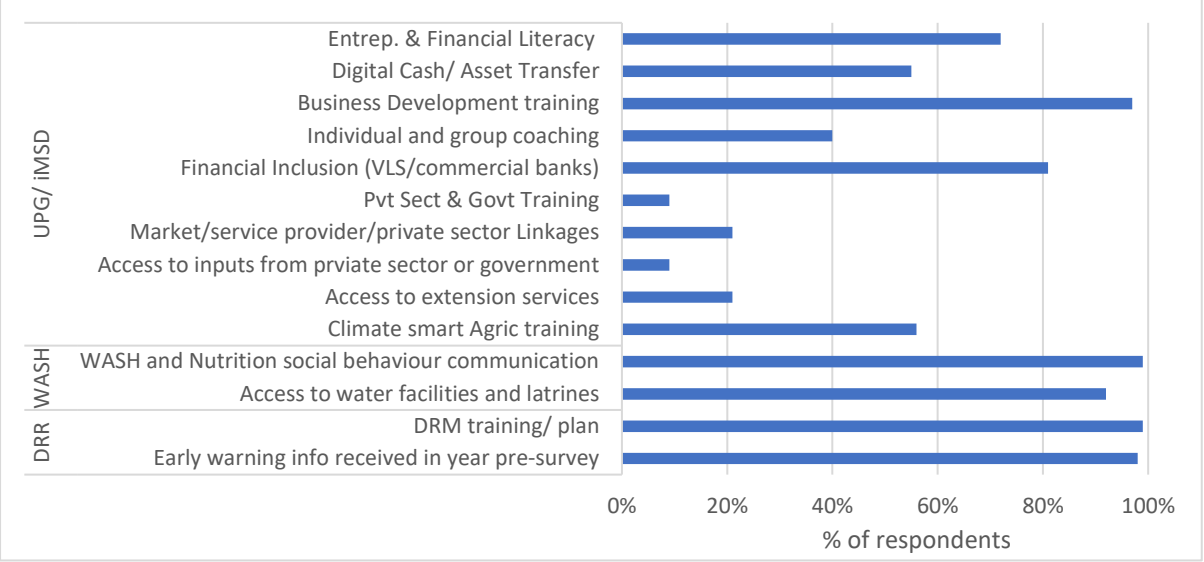


Table 4: Summary statistics of variables of interest related to outcomes

	UPG+iMSD		UPG+iMSD+ DRR		UPG+iMSD+ WASH		UPG+iMSD+ DRR+WASH	
Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Avg Poverty Likelihood (national threshold, 75.61 Bangladeshi taka per day in 2016 values)	37.94	19.24	36.68	18.77	35.79	18.31	37.07	18.31
Asset index	-0.09	0.80	0.06	1.03	-0.08	0.88	0.12	1.19
% HH- reported income increased	0.81	0.39	0.73	0.44	0.78	0.41	0.72	0.45
% HH- reported income remained same	0.09	0.28	0.13	0.34	0.10	0.30	0.15	0.35
% HH- reported income decreased	0.10	0.30	0.13	0.34	0.12	0.33	0.13	0.34
Household Food Insecurity Access Scale (HFIAS)	4.52	2.44	4.33	2.58	4.56	2.59	4.37	2.65
Improved water source (% HH)	0.31	0.46	0.38	0.48	0.35	0.48	0.39	0.49
Improved sanitation facilities (% HH)	0.92	0.27	0.93	0.26	0.96	0.20	0.98	0.14
Preparedness actions for current shocks (% HH)	0.79	0.41	0.76	0.43	0.78	0.41	0.75	0.43
Preparedness actions for future shocks (% HH)	0.95	0.22	0.95	0.22	0.94	0.23	0.96	0.21
Observations	483		474		482		485	

We next examine participation in intervention activities focused on UPG integrating iMSD. From this, we observe that 97% of participants mentioned that they had received business development training, 81% on financial inclusion, and 79% on entrepreneurial and financial literacy (Figure 4). There was limited reported engagement in some activities despite the fact that these activities were included in the Nobo Jatra implementation package. For example, though all participants in Cohorts 1 and 2 and a majority in Cohort 3 were expected to have received cash transfers through Nobo Jatra, only slightly more than half reported receiving this transfer according to Figure 4. The qualitative data points to various instances where participants did not remember the contents of the training up to five years later (which may be unsurprising given the time since the intervention).

Figure 4 Participation in NJP activities or services in the five years preceding the survey



Relationship between participation in interventions and wellbeing outcomes

Regression analysis corroborates the descriptive analysis above. **The results in Table 5 show that participants who received DRR and WASH services together with the UPG programme are associated with a statistically significant higher asset ownership (index) compared to participants who received just UPG (Model 1). Furthermore, participants in this combination show a lower likelihood of being in extreme poverty** by 2 percentage points compared to those who only participated in the UPG programme (Model 2). A lower poverty likelihood is also observed among UPG+DRR participants compared to those who only received the UPG program. The fact that UPG+DRR is associated with a lower probability of poverty, albeit with a small effect size (1.7 percentage points), suggests that DRR activities do play a role in preventing potential impoverishment. However, the status of wellbeing indicators (asset index, PPI, income change, HFIAS) of respondents in UPG+WASH study group is not statistically different from that of respondents in the UPG alone study group. Access to WASH services was hypothesised to have a positive influence in preventing impoverishment. However, the pathways of impact appear subtle for example in terms of reducing time poverty or improving perceived dignity or social status. This is discussed further in Section 4.3.

Table 5 Relationship between layered interventions and household wellbeing

Outcome:	Asset Index	PPI	Income increase	Income decrease	HFIAS
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
UPG+DRR	0.086	-1.668**	-0.239**	0.207	-0.040
	(0.072)	(0.818)	(0.108)	(0.127)	(0.185)
UPG+WASH	0.008	-0.765	-0.089	0.183	-0.040
	(0.061)	(0.753)	(0.102)	(0.118)	(0.171)
UPG+DRR+WASH	0.224***	-1.999**	-0.231**	0.105	0.135
	(0.085)	(0.879)	(0.117)	(0.139)	(0.203)
Cohort 2	0.037	0.437	-0.060	0.234**	-0.405***
	(0.053)	(0.614)	(0.082)	(0.098)	(0.140)
Cohort 3	-0.008	-1.040	-0.151	0.283*	-0.476**
	(0.090)	(1.016)	(0.128)	(0.152)	(0.223)
Controls	Y	Y	Y	Y	Y
Constant	-0.724***	16.715***	0.294	-1.098***	4.472***
	(0.135)	(1.971)	(0.247)	(0.287)	(0.426)
Observations	1563	1558	1563	1563	1563

Note: Here and in the regression tables that follow, controls include demographics (household head sex, age, size, education level), access to savings, primary income source of household head, receipt of remittances, and shocks due to disasters and ill health. Please see Annex Table D3 for full results.
Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

However, the results also indicate that participation in UPG+DRR and in UPG+DRR+WASH are each negatively associated with perception of income increases (Table 5, Model 3) relative to participation in UPG alone. This could be because DRR and WASH activities are not typically implemented to directly increase income. It could also be a reflection that what matters most in contributing to income increases is the activities targeted at the household level.

Finally, we also include cohort controls in our model. Results show the level of asset ownership, incidence of poverty (PPI), and perceptions of income increase among respondents in cohorts 2 and 3 are relatively similar to those of respondents in cohort 1. This suggests **economic gains among respondents in cohort 1 had not significantly eroded since graduation from NJP UPG programme**. However, relative to the first cohort, belonging to cohorts two and three is associated with a higher probability that the participant perceives their income to have decreased, but a lower probability of food insecurity. The result around income decline could be a reflection of less time prior to the pandemic for more recent cohorts to establish before COVID-19 struck. The lower probability of food insecurity among these cohorts suggests that the changes in operation structures, processes, and activity design especially into the third cohort was effective in helping reduce severe forms of food insecurity among people who began the intervention in ultra-poverty.

We next developed an activity specific (or tailored) intervention variable to capture specific activities in the WASH and DRR intervention components that households were involved in. This is different from the intervention groups outlined in Table 5, as it is now instead constructed based on activities (from Table 1) which the respondents self-reported engaging in or receiving. In contrast, Table 5 relies on an allocation of respondents to intervention groups as outlined by project implementors. The results in Table 6 show that **the combination of WASH and DRR activities (with UPG) is significantly associated with an increase in the probability that households have experienced an increase in their income over the years preceding the survey** (Model 4). The results show that WASH activities[11] with UPG, and in combination with DRR activities[12] with UPG, are both associated with a higher probability that individuals experienced an increase in their incomes and a lower probability of experiencing reduction in their income (Models 2, 4, 6, 8). This suggests DRR plays a role in contributing to the sustenance of productive assets (e.g., livestock and crops) that might otherwise be destroyed during disasters, and the role of WASH in preventing the diversion of savings that might otherwise go towards treating water-borne diseases.

Table 6 Relationship between activities and income changes

	Income increase			Income decrease		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
WASH-/Nutrition-SBCC and access to water facilities	0.561***			-0.365***		
	(0.109)			(0.123)		
DRM training/plan and early warning information receipt		0.134			-0.193*	
		(0.091)			(0.103)	
WASH + DRR activities [as above]			0.528***			-0.353***

[11] WASH and Nutrition social behaviour communication and access to water facilities.
[12] DRM training/ plan and also having received information on the early warning system in the year preceding the survey.

			(0.106)			(0.119)
Controls	Y	Y	Y	Y	Y	Y
Constant	0.356	0.669**	0.374	-1.167***	-1.279***	-1.168***
	(0.308)	(0.295)	(0.307)	(0.355)	(0.342)	(0.354)
Observations	1743	1745	1743	1743	1746	1743

*Notes: each column represents a different regression with the variable of interest identified on the left-most column and all controls remaining the same. Standard errors in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01.*

The sections that follow present mixed methods results on the ways in which the different combinations of interventions may have helped strengthen resilience capacities to tackle chronic poverty, prevent impoverishment, and sustain escapes from poverty.

4.2 Developing absorptive and adaptive capacities through UPG/iMSD to tackle ultra-poverty

Hypothesis 1: Participation in UPG programme with iMSD is associated with absorptive and adaptive resilience capacity development to tackle chronic poverty.

Regression results in Table 7 show there is a positive association between engagement in most activities and perceptions that income increased in the five years preceding the survey.[13] The effect sizes were substantial, ranging from a 16 percentage point higher probability of experiencing income increases for participants reporting access to public extension services, up to a 42.5 percentage point higher probability of experiencing income increases for households engaging in business development training. One reason for such strong positive associations is that the activities (coaching, various forms of business-related training, business development, market links, climate smart agriculture training, and access to extension services) are designed and implemented as income generating activities, directly implemented by Nobo Jatra or through close engagement with the private sector.

As noted earlier, UPG with iMSD activities strengthen the absorptive and adaptive resilience capacities of individuals. For example, training on climate smart agriculture, such as adjusting planting dates and adopting new crop varieties (adaptive capacities mentioned in Table 2), can help households adapt to climate risks. This is an area where climate-smart agriculture intersects with DRR and thus can offer synergies. The results in Table 7 also reveal, unexpectedly, a lack of statistical significance in the association between perceived income increase and participation in cash transfers, financial inclusion, and input access. This may relate to the limited role of tangible assets without an enabling environment, such as through NJP's coaching/mentoring, business development, and other aspects that can enhance the effective use of financial tools and inputs.

Table 7 Relationship between activities and subjective increase in income

[Outcome: income increase]	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Activities										
Cash or asset transfer	0.016									
	(0.074)									
Individual/group coaching		0.213***								
		(0.081)								
Entrepreneurial or financial literacy training			0.213***							
			(0.081)							
Business development				0.425**						
				(0.176)						
Financial inclusion					0.035					

[13] We examined the association between activities and other outcomes (assets, PPI) but these generally lacked statistical significance, so for brevity we focus our analysis going forward on income-related dependent variables.

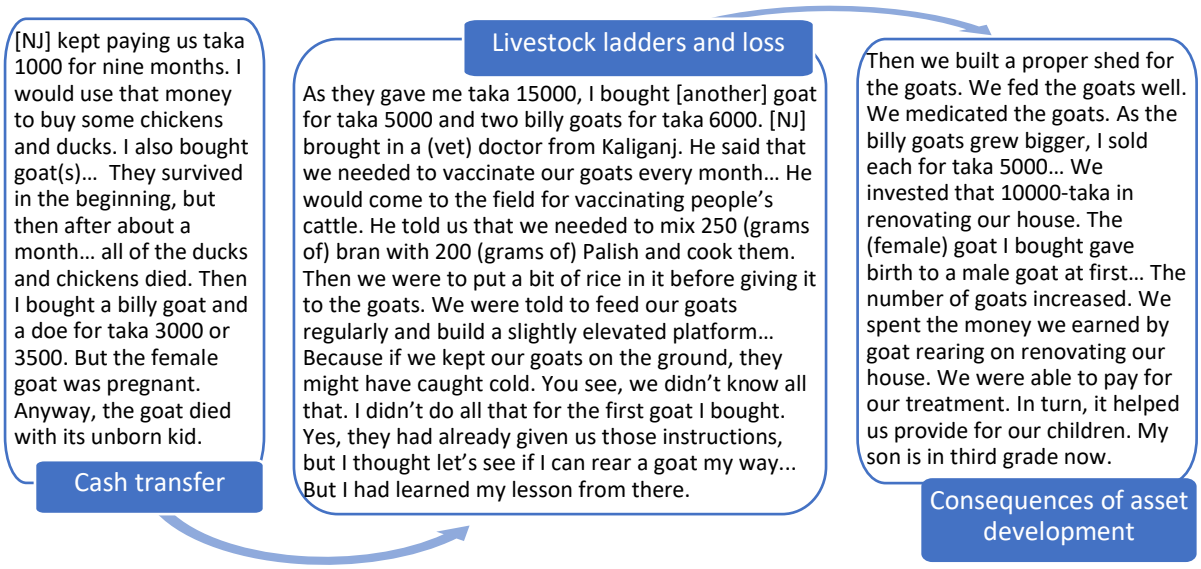
					(0.089)					
Training from pvt & govt						0.334***				
						(0.129)				
Market linkages							0.378***			
							(0.092)			
Input access								0.186		
								(0.125)		
Extension service access									0.169**	
									(0.086)	
Climate smart ag. training										0.345***
										(0.071)
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	0.705**	0.599**	0.500*	0.295	0.684**	0.698**	0.563*	0.688**	0.621**	0.479
	(0.294)	(0.291)	(0.298)	(0.338)	(0.302)	(0.288)	(0.292)	(0.289)	(0.293)	(0.294)
N	1743	1743	1743	1743	1743	1743	1743	1743	1743	1743

*Notes: each column represents a different logit regression with the variable of interest identified on the left-most column, and all controls remaining the same. Standard errors in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01*

In the qualitative data, UPG interventions were similarly observed to contribute to an increase in income sufficient to enable households to escape poverty. **Most households continued to engage in farming on small plots of land, which became more profitable and more diversified**. Aarti (UPG+DRR, transitory escaper- TE) noted that, '*Earlier, the insects would destroy our plants. We didn't know how to save the plants, but after participating in Nobo Jatra I learned what to use to keep the insects away, which fertiliser to use,'* thus developing her anticipatory capacities to future shocks. Shyamoli (UPG, sustained escaper- SE) recalls, *'They told us to dig a hole somewhere near the house or in the crop field and make compost in that hole. We were told to cover that hole and make sure that water couldn't get inside… Applying that compost helped yield a better crop. We got more taro roots.'* Another FGD participant noted that Nobo Jatra taught participants how to farm fish in the Ghar, *'Now we know in which season we should cultivate which fish. How to control the PH level of the water. How the water should be purified. Our husbands do fish farming and we work with them. Now our husbands also listen to us. We earn profit by following the learning from the training. Now fish farming is profitable. Now we know when we should give food to the shrimp,'* they explain. Similarly, vegetable gardening also enabled many households to diversify cultivation.

Another way in which the UPG intervention contributed to improvements in wellbeing was through livestock activities, which many households chose to engage in using the Nobo Jatra cash transfers. Mukta (UPG+WASH, SE) was able to save money from rearing goats and ducks. With this, she notes, '*I was able to maintain the family smoothly and pay my younger son's school fees and private tuition fees*.' Shyamoli (UPG, SE) was able to build her livestock holdings as a result of the cash transfers and precise technical advice from Nobo Jatra (Figure 5). The livestock ladders she developed with disbursed transfers over time, coupled with interventions around precise technical advice on livestock rearing, enabled her to improve her accommodation, pay for treatment in times of ill health, and offer a source of income with which to provide for her children's education.

Figure 5: Livestock ladders out of poverty

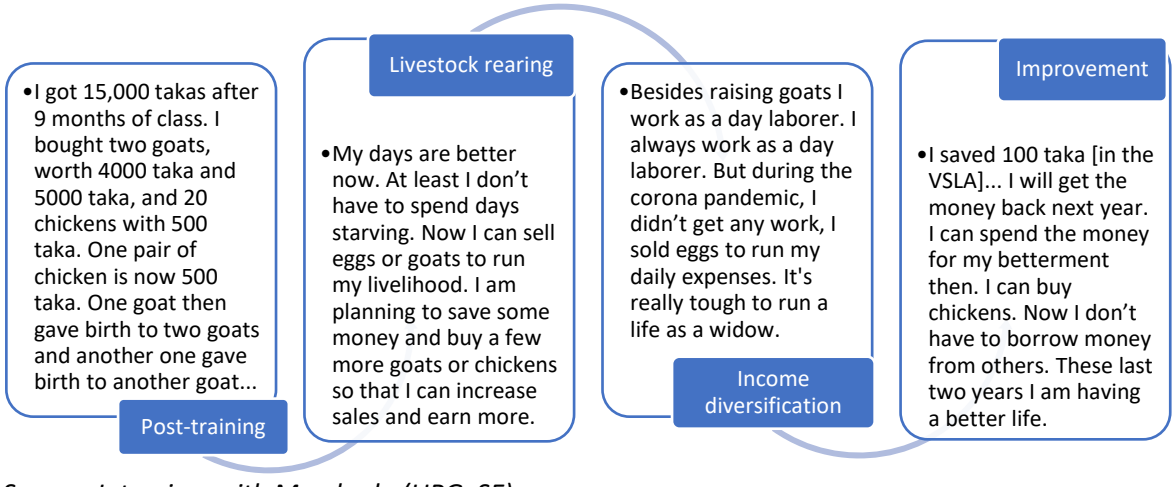


Enhanced farm production appears to have contributed to an increase in household income and wellbeing, including food security. Mahmuda (UPG+DRR+WASH, SE) notes,

> *Our financial condition has improved a lot … We get to eat better now. I don't have a fridge, but there's a fridge at the madrasa. I have three days' worth of fish stored in that fridge at the moment. So, it wouldn't be a problem for us if we don't buy fish for three days. Moreover, we do not get sick as often either. In the past, we would often get sick due to not eating fish and vegetables. Things are much better for us now.*

Morsheda (UPG, SE) similarly recalls that, *'Before attending the Nobo Jatra classes, I used to go to work starving. Even at Nobo Jatra, I attended classes without food.'* However, after the training, she developed a plan to grow her livestock (Figure 6). This forward-planning component was observed in various life histories interviews as a result of the programme's coaching element. Morsheda noted she also continued her work as a day labourer, thus offering multiple streams of income. Though she recognises the added challenges she has as a widow, she no longer has to borrow and continues to maintain her wellbeing in spite of pandemic-induced livelihood stressors.

Figure 6 Escapes from food poverty and sustained improvements



Source: Interview with Morsheda (UPG, SE)

The qualitative data suggest that a key pathway through which households in ultra-poverty were able to increase their absorptive and adaptive capacities was through the structured community savings mechanism (Village Saving and Loan Association- VSLA, also referred to as Baksho Shomiti

in study sites). The habit of saving that many respondents attributed to the programme limited their need to borrow from other sources and potentially become indebted. These group-based savings offered an important absorptive mechanism. One KI noted that, '*sometimes the members and their neighbouring people get inspired in opening personal savings accounts after seeing how the joint account of the Baksho Shomiti is run. It encourages a saving mentality among people.*' As a result, many respondents felt that they had less need to borrow from other sources. Mala (UPG+DRR+WASH, TE) noted that, '*there have been occasions when I borrowed from my relatives… After Nobo Jatra, I rarely have to borrow… I don't have any unpaid loans*.' In some cases, the transfers were also used to settle existing debts. Lamia (UPG, SE) recalls that, '*The money was spent on the very day I had received it. I had to give some money to my husband, some to others, and to pay off the debt we had. We were in debt to a shopkeeper. Yes, we used to buy rice and other stuff (on credit) from that store*.' For Aarti (UPG+DRR, TE), when her husband would temporarily leave the family, she was able to rely on her savings for family maintenance.

At the same time, there were challenges in implementing the training within the layered programmes due to limited ability to absorb the teaching, despite the coaching element. Aklima (UPG+WASH, TE) noted that during the UPG programme trainings, '*They taught us to sign our names at Nobo Jatra but I couldn't get the hang of it. I am a poor woman and catching crabs and looking after the children, it proved to be too hard*.' The absence of this foundational literacy, in turn, may also constrain the development of resilience capacities and has been observed to limit pathways out of poverty in the wider literature (Diwakar et al., 2021). In another example, Ritu (UPG+DRR+WASH, SE) notes around DRR training that, '*They asked us to take the cattle to the cyclone shelters, but we did not pay attention to this. We only received one or two training [courses]. So we could not properly understand this. Therefore, we sold the cattle*.' In this context, further coaching or mentorship to work through Ritu's constraints and monitor the situation before, during, and after shocks would have strengthened her anticipatory and adaptive capacities in times of distress, and through this may have helped her retain and grow her cattle over time. There were other instances of distress asset sales during or after floods that could similarly benefit from tailored coaching to minimize participants' negative longer-term impacts to shocks and stressors.

Finally, many respondents felt that they did not have enough space to grow vegetables within or outside their homes, and thus were unable to further develop their adaptive capacities through this form of livelihood diversification. Mahinoor (UPG+DRR+WASH, TE) recalls,

> *We don't have any space surrounding the house where we can plant vegetables. We are rearing ducks. If we plant some vegetables, the ducks will destroy those. Mainly, we don't have any room for planting vegetables here. My children play in the yard, and we hang our clothes here for drying. There's the tube-well and the duck coop is over there. So, how can I plant vegetables?... Yet so, I tried very hard to grow some vegetables… because when I took the money, I gave my word (that I would try).*

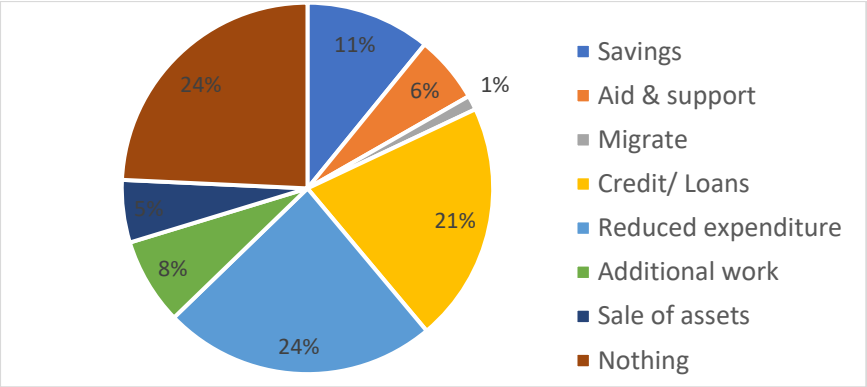
These results around mentorship and space point to the inadequate enabling environment that sometimes limited the ability of households to put the training into practice, in many cases constraining their ability to escape chronic poverty. We return to this in Section 5 when discussing programming implications.

4.3 Strengthening anticipatory and absorptive capacities through WASH and DRR to prevent impoverishment

Hypothesis 2: DRM training and mobilization and access to WASH services contribute to improving absorptive and anticipatory resilience capacities.

Preventing impoverishment requires an ability to 'face and manage adverse conditions' in ways that can maintain wellbeing. The study areas were affected by various adverse conditions, including disasters, over the intervention period. Descriptively, in terms of disasters, 77% of Nobo Jatra members reported being affected by floods, cyclones, water logging, or too much/ early/ late rains in the year preceding the survey. This is followed by 12% of sample that were affected by earthquakes and 11% who said they were affected by droughts and erosion. The negative impacts of shocks were generally associated with a lower probability of income increases and a higher probability of income loss in the years preceding the survey (Table D3). **In response to shocks, many households reduced expenditure on food, health, and education** (Figure 7). We also observe a large proportion of respondents resorting to borrowing or using up their savings.

Figure 7 Pie chart for various coping strategies used by households



To model the potential transmission mechanisms, we examined the relationship between engagement in DRM training, alongside receiving information on the early warning system, on one hand, and engaging in DRR-related actions on the other (Table 8). This allows us to understand the potential transmission pathways through which engagement in NJP activities contributed to enhanced anticipatory resilience capacities. **Results indicate that access to WASH and DRR services is associated with a higher probability that households are partially or fully prepared to face a disaster in the future and are more prepared to handle a disaster relative to five years ago** (Table 8).

Table 8 Relationship between combined DRR activities and actions taken

Outcome:	Preparedness actions, current shocks	Preparedness actions, future shocks	Preparedness actions, current shocks	Preparedness actions, future shocks
Variables	(1)	(2)	(3)	(4)
WASH DRR	0.867***	0.452***		
	(0.109)	(0.165)		
DRR			0.515***	0.058
			(0.090)	(0.161)
Controls	Y	Y	Y	Y
_cons	0.214	1.092***	0.488	1.326***
	(0.291)	(0.313)	(0.301)	(0.356)
N	1743	1676	1746	1677

Note: Preparedness refers to households responding that they are partially or fully prepared to face a disaster. Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Moreover, DRR preparedness is associated with a higher probability of perceptions of income increase and lower probability of income decline in the five years preceding the survey (Table 9). These results empirically justify our initial hypothesis that DRR actions, such as preparedness plans and forecast-based early actions, may enhance the household capacity to anticipate and reduce the

impact of climate-related stressors and disasters. This, in turn, safeguards households from falling back into ultra-poverty.

The qualitative data linked improvement in disaster preparedness to Nobo Jatra community-level trainings on climate risk warning signs and responses to these. Because of **Nobo Jatra, people started to become more aware about the risks of disasters and how to prepare for them**. Participants like Bilkis (UPG, TE) and Moushumi (UPG+WASH, TE) have used the UPG cash transfers to buy mobile phones. This, even if not necessarily the primary motivation behind its purchase, proved to be an important resource to help spread information, which can be crucial for women who are often left inside the house during disasters. Through the training they also learned various practices to safeguard their assets. Nusrat states, '*They trained us about food – during cyclone or disasters how to be safe, save dry foods and save houses from destruction. Houses should be tied down to earth, then we have to go to cyclone shelters during cyclone.*' Participant linked DRR activities (in particular, access to information through mobile phones, helpline, and construction of cyclone shelters) to saving livestock, homes, and food stocks where floods are highly frequent. DRR thus offers important pathways to limit impoverishment.

Table 9 Relationship between DRR actions and reported income change

Outcome:	Income increase	Income increase	Income decrease	Income decrease
Variables	(1)	(2)	(3)	(4)
Preparedness actions against current shocks	0.235***		-0.184*	
	(0.082)		(0.094)	
Preparedness actions against future shocks		0.502***		-0.358*
		(0.174)		(0.194)
Controls	Y	Y	Y	Y
Constant	0.577*	0.293	-1.248***	-1.090**
	(0.297)	(0.338)	(0.340)	(0.387)
N	1745	1743	1746	1744

Standard errors in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01

Insights from the qualitative data also pointed to various pathways of decreasing income and related impoverishment. **Households that had recently become impoverished were more likely to report challenges due to disasters, compared to households that had escaped and remained out of poverty**, according to the qualitative data. In the last five years alone, respondents spoke of various cyclones Nargis, Amphan, Bulbuli, Mahasen, Yas, Foni, and Jowad. Waterlogging was cited as a major problem that was prolonged and more frequent over the last few years compared to the previous decade. Salinity was also a problem and caused an additional challenge, as it meant that households had to sometimes travel distances to access improved water for own consumption and were unable to feed grass to their livestock. As a result of these disasters, some households report being unable to preserve their livestock. These findings suggest that although DRR and WASH services do enable preparedness for disasters, there were still considerable constraints limiting their effectiveness.

There was also a shift in livelihoods away from farming and towards more insecure seasonal occupations. This was largely a result of increased salinity and flooding destroying crops, irregular rainfall contributing to water logging, and rising population putting pressures increasingly on smaller farm plots. Sultana (UPG+WASH+DRR, SE) said, '*Vegetables are not growing now due to the flood. All my vegetables died as they went under water during the flood*.' As one person in a FGD noted, since crops started to give low yield and increasing water salinity, people are now making the fish enclosures in the same land and have moved to work in the brick kilns as low-paid day labourers. Both options are seasonal occupation choices and have their own risks and vulnerabilities/insecurities. For example, farming in the fish enclosures is very uncertain as the fish often get swept up during floods and currently there is no way for the villagers to prevent that. On the other hand, working in the brick

kilns requires many workers to leave their houses and live near the kiln for the entire season, which is less viable for women who report harassment, assault, and reputational harm when living separately from their families.

We performed similar quantitative analysis for WASH-related assets of households. **The results show that an improved water source is associated with a lower probability that the household reported income decline**, though with relatively low effect sizes and only statistically significant at borderline conventional values (Table 10). This might be the case if the availability of improved water sources reduces households' burden of diseases, thus allowing families to spend less on health care expenditures that might otherwise use up much of their income. Although this lower burden of disease may also improve income by enhancing the productivity of healthy income earners, the transmission mechanism is less obvious. Even so, the results below, along with the combination of access to WASH along with SBCC, as outlined by Table 5 above, suggests that a package of NJP WASH interventions remains an important part of strengthening anticipatory and adaptive capacities.

Table 10 Relationship between WASH actions and reported income change

Outcome:	Income increase	Income increase	Income decrease	Income decrease
Variables	(1)	(2)	(3)	(4)
Improved sanitation facility[14]	-0.001		-0.016	
	(0.058)		(0.048)	
Improved water source[15]		0.030		-0.030*
		(0.022)		(0.017)
Controls	Y	Y	Y	Y
Constant	0.742***	0.743***	0.126	0.109
	(0.097)	(0.083)	(0.080)	(0.069)
N	1729.000	1729.000	1730.000	1730.000

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In the qualitative data, the benefits of improved water and sanitation were felt by most respondents, especially in terms of limiting certain forms of ill health and associated impoverishment. A KI working in a water plant noted that Nobo Jatra made several small Reverse Osmosis plants to gather and filter water:

> *The rate of diarrhoea and acidity was high back when there was no plant. Now it is comparatively lower. My brother owns a pharmacy and I have observed that the sales rate of acidity medicine has reduced. My brother said it has reduced a lot… We now understand that water is the source of all the diseases*.

Technical advice through NJP's iMSD to plant staff also helped ensure effective operationalisation of these facilities that supported people's wellbeing. Improved sanitation has also helped. Tanjila (UPG+WASH, SE) recalls that Nobo Jatra built her household a toilet:

> *There is no odor or flies or mosquitoes in the toilet now. But earlier, when we did it in an open hole, flies would land there and then they would fly back inside our room and land on rice and other foods*.

Ritu (UPG+DRR+WASH, SE) still spreads Nobo Jatra messaging:

[14] Improved sanitation facilities are defined as those that hygienically separate human waste from human contact. In our analysis, the improved sanitation included pit latrine with ventilator, pit latrine with slab, and a sanitary with flush facility. Bucket or hanging toilet, as well as bush, field, or no toilet at all are not considered to be improved.

[15] The improved water sources include piped water supply both inside or outside the house, own tube well, community tube well, ring well, or Indara. Other sources of water such as rainwater, pond or rivers, and tube wells for irrigation were considered unimproved water sources

I still visit people's houses and if find any unhygienic toilet I tell them to change it otherwise their children might suffer someday. Because flies can spread diarrhea and cholera. These diseases will cost thousands of money.

Despite improved health through WASH infrastructure in households and communities, other forms of ill health remained as key drivers of impoverishment. Indeed, in the quantitative data, over a third (36%) of households reported death, illness, or accident of a household member as a negative shock affecting their households in the year preceding the survey. In the qualitative data, reasons for ill health were varied, including COVID-19, backaches limiting mobility, paralysis, epilepsy, typhoid, dizziness, and mental ill health. Similarly, an FGD noted,

If the only earning member becomes sick, then the condition of the household becomes worse. Household financial conditions become unstable. At that time, they have to eat less than usual and also have to eat low quality food. Low quality food means they only can eat vegetables and mashed potatoes. They cannot eat meat or fish.

Jannat (UPG+WASH, TE) notes,

I had gotten ill. After that, my husband died. It's been 5 months since his death. I have a lot of tension. I worry about how I would provide for my children now. I am overwhelmed with my anxieties about various things. Thus, I don't think about matters of the long past… I can't memorize anything due to all my tensions. I can't sleep at night. I feel dizzy due to lack of sleep and my anxieties… Don't we have 6 members in the family? But there's not a single person to earn income.

More generally, there was a lack of new work opportunities for men and women observed in the study communities, and limited marketing options reflecting a context of depressed rural demand. These **livelihood challenges were compounded during the pandemic**, when certain activities like transport-related work, or work in hair salons or brickfields were off or irregular, and community activities were restricted. Paniya and Bazargram respondents mentioned very strict lockdowns due to their close proximity to India. Local government officials told them to stay at home and drink water if they had no food, but not to go out. As a result, many who had escaped poverty fell back into it during this time because they had to close shop, sell off assets, or sell poultry and eggs locally at very low prices rather than the higher prices they had previously obtained through the markets. As Jasmine (UPG+WASH, TE) recalls,

Corona has caused us enough damage. It is impacting our means of livelihood. You see, my husband can't earn as much income at the fish market. Yes, they used to pay my husband BDT20-50. But they would also give him some fish, which we could then sell for BDT250, or 100 or at least 50. But if they don't give him the fish, how can we get that money?... When the lockdown was about to be issued, they couldn't transport the fish to distant areas… The price of fish lowered. So, you couldn't possibly get a good price for your fish at that time. How the price of other things such as oil, grocery items, and spices spiked despite such a drop in the price of fish! Those items became absurdly pricey! We didn't have enough fish in the Gher. On top of that, the price of fish had dropped. We didn't know how to maintain our family.

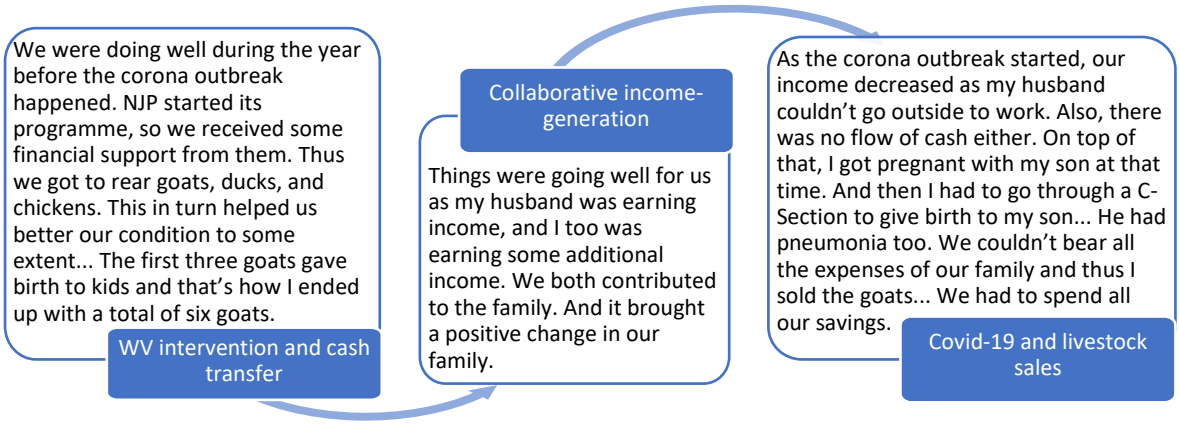
There was also a perception by some participants of limited information during the pandemic adding to this uncertainty, as Lamia (UPG, SE) reflected, '*we haven't been to any [Nobo Jatra] meetings recently. We don't know what has happened recently.*' This suggests that at least in some cases even if not universal, the project may not have sufficiently adapted to COVID-19. Although Nobo Jatra staff reported delivering cash transfers to mitigate the impact of COVID-19 within the existing programme resources, the depth of income loss and uncertainty associated with the pandemic meant that this was often inadequate.

To cope with various shocks and crises such as ill health, disasters, and COVID-19, some households were driven to erosive coping strategies. The coping strategies are summarised in Figure 5, with

reduced expenditures and loans being the main ones. In the qualitative data, many interviewees also responded to crises by taking loans from loan sharks, accruing high debt. In other cases, constraining prospects for longer-term recovery, the community savings groups met and decided to dissolve their savings and take back in the proportions that they had saved in. Others got young daughters married during this time, which they reported that they would otherwise not have done. Another key coping strategy was in terms of livestock sales. Livestock accumulation, as well as loss, was more frequently reported in the qualitative data among sustained escapers compared to transitory escapers, suggesting that they may have been more regularly able to rely on livestock in times of distress while continuing to engage in livestock rearing. Sadia (Figure 8) was instead forced to sell all of her livestock due to a halt in income coupled with the birth of her son. Kolpona (UPG+DRR, SE) managed to sell pigeons to maintain wellbeing:

> *"Nobo Jatra gave us a lump sum amount of Tk.15000. I bought goats and pigeons with that money… I bought four pigeons first and the number gradually grew to 200-250. I sold almost all of them because of the coronavirus pandemic. We had no income during the pandemic, so I had to sell my pigeons to survive. I sold them for Tk.400-Tk.500 a pair and ran my household with that money… I still have eight pigeons left. They live in a separate house… I used to raise pigeons then and I fed my family by selling them whenever I needed to. I had no other choice… Yes, I had to sell my pigeons but still that helped us to survive this difficult time."*

Figure 8: Livestock sales to address ill health amid the pandemic



Source: Interview with Sadia (UPG+DRR, TE)

Other households, however, were unable to rely on livestock to smooth consumption given the widespread prevalence of livestock deaths, which many respondents attributed to floods and livestock diseases with unknown causes. Puja (UPG+DRR+WASH, TE) notes,

> *I have stopped raising goats. I bought a couple recently and now goats are getting sick all around us and the poultry is also getting infected with the disease. The ducks and hens exhibit symptoms of cold and fever and then die. The goats are suffering from cold and getting the runs and dying. Yes, I consulted the vet. He gave medicines which cured the animals sometimes but not always. Every household in our neighbourhood has been affected by this… I don't know the exact causes of the disease.*

There were also mixed reports around veterinary services, for which several respondents mentioned having access through Nobo Jatra, but others not. Nashiba (UPG+DRR, TE) said,

> *Nobo Jatra didn't put me in touch with any vets… Nobo Jatra only said that there was a vet and they gave me some powder and pills which they got from him… But still the billy goat didn't survive. I could have sold him for at least 8-9 thousand takas. There too, I suffered a loss.*

There may be some confusion here as the NJP project did not provide livestock drugs as part of the intervention, but did support local service providers providing technical services and selling medicines as part of their veterinary services. Regardless, in the qualitative data, some households stopped

livestock rearing after the intervention, limiting absorptive capacities over the longer term: '*We had to spend taka 20 or 30 a day to buy chaff and other stuff to feed them. But there was no point in doing it anymore as they were dying*' (Mahinoor, UPG+DRR+WASH, TE). In the quantitative data, 37% of respondents who had farmed or sold livestock as their primary occupation before Nobo Jatra trainings no longer had this as their primary income source at the time of interview, while 35% continued this activity and 28% newly took up the activity as their primary income source.

4.4 Enabling adaptation and transformation to sustain poverty escapes

Hypothesis 3: Social and behavioural change components in WASH and women's gender equality and empowerment sustain escapes from poverty.

To sustain improvements in wellbeing over the long-term, transformative resilience capacities are needed. Women's economic empowerment might be a transformative resilience capacity insofar as it can allow women more access to resources and decision making to improve their wellbeing, enjoy their rights, and build resilience. As a proxy for women's economic empowerment, we analyse the relationship between the interventions and women's agency, and in turn between women's agency and wellbeing. Women's agency is measured through their autonomy in making decisions on their own or jointly with their partners about household expenditures.[16] Household expenditure decisions were divided into major (involving buying assets such as bicycle) and minor (involving buying food) decisions. **Results in Table 11 indicate that participants who had access to WASH and DRR services relative to UPG alone are associated with a higher probability that women participate in making major household decisions.**

Table 11: The effects of activities on WEE

Outcome:	Minor decisions				Major decisions			
Key variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All activities	0.248				0.021			
	(0.241)				(0.223)			
All WASH		0.192				0.242*		
		(0.127)				(0.126)		
All DRR			-0.056				-0.067	
			(0.109)				(0.106)	
WASH + DRR				0.181				0.268**
				(0.124)				(0.121)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Constant	1.318***	1.157***	1.390***	1.166***	1.368***	1.153***	1.434***	1.128***
	(0.270)	(0.294)	(0.280)	(0.294)	(0.267)	(0.293)	(0.280)	(0.291)
Observations	1743	1743	1746	1743	1743	1743	1746	1743

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Results in Table 12 also show that women who participate in making major household decisions are associated with a higher probability that they experienced an increase in income. Women who participate in making major household decisions were also less likely to report a decline in income. These results suggest that removing the constraints women face in accessing resources and increasing their agency may strengthen their transformative capacities and improve intra-household relationships important to household resilience and wellbeing.

Table 12 Relationship between female agency and reported income change

Outcome:	Income increase	Income decrease

[16] Note that agency (ability to make choices) is different from power (ability to control and share in resource use). We focus on agency due to data availability.

Variables	(1)	(2)
Minor expenditures	-0.130	0.080
	(0.127)	(0.148)
Major expenditures	0.290**	-0.242*
	(0.124)	(0.144)
Controls	Y	Y
Constant	0.495**	-1.373***
	(0.233)	(0.277)
Observations	1745	1746

*Standard errors in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01*

Collaborative spousal engagement in economic activities was also observed regularly in the qualitative data and helped contribute to improved income and wider wellbeing of respondents. Such collaboration is transformative as it ensures more equitable sharing of risk and overcoming certain intra-household inequalities. Romela (UPG+DRR, SE) states that she and her husband "discuss and make decisions mutually. We tell each other that we can do something with our joint income. That's how we manage to make things better for ourselves." Mukta (UPG+WASH, SE) also feels that she has a position in her family now which she did not have before, such that even if she skips work for a day, she still manages to run her household smoothly. Reduced sources of impoverishment due to DRR and WASH interventions furthermore enabled her to smoothen household consumption more effectively. Finally, a male FGD also reflected on the benefits of spousal collaboration: *'When we started joining the meeting arranged by Nobo Jatra, we learned about a lot of things. Suppose I earned BDT 200… If my wife tells me that it would be better to spend somewhere else, it might be the case that we can run the household for two days instead of one on this BDT 200.'*

However, data also suggest women's empowerment remains limited for some or in some areas, including women's mobility. One male FGD observed, "*If both the husband and wife work, it leads to more arguments as both of them want to be equal.*" Several respondents also mentioned facing opposition from family members when they wanted to participate in the NJP. Jannat's (UPG+WASH, TE) husband mocked her when she tried to talk to him about participating in household decisions. Kolpona's (UPG+DRR, SE) husband was initially not willing to let her participate in the NJP, fearing that people would talk. She reflects,

> *So, how did I manage to convince my husband? I cajoled him to let me join and told him that, with the money (Tk.1000) I would get every month, I could pay my son's private tuition fees. That softened his stance a bit and after he came home from his last trip he told me I could go.*

Transformative resilience capacities in the sample could also arise from engagement in community groups, many of which were initiated or highly supported by Nobo Jatra. These groups can strengthen social networks and improve access to resources (savings and loans) that can be sources of transformative capacities. We examined the relationship of group participation with wellbeing outcome indicators. **Results in Table 13 show that membership in savings/credit groups (where the participant felt they would be able to rely on the group for support during an emergency) and membership in farmers groups were both associated with a higher probability that women participants experienced an increase in income (by 44.1 and 39.6 percentage points, respectively) and a lower probability of income loss**. In the qualitative data, however, in some cases VSLs had disbanded during the pandemic. Though these were reinitiated, not all group members re-joined the savings groups. Other research also points to the role of community savings groups in reviving the local economy during COVID-19 as well as during the aftermath of cyclone Amphan. Participation in religious groups was also associated with a lower likelihood of poverty, building on other studies that

point to the role that *Zakat*[17] plays in poverty reduction and socioeconomic well-being in Bangladesh (Ali and Hatta, 2014).

Table 43 Relationship between group participation and reported income change

Outcome:	Income increase	Income decrease
Variables	(1)	(2)
Savings/credit group[18]	0.441***	0.198
	(0.106)	(0.131)
Famers group	0.396**	0.350
	(0.164)	(0.218)
Market group	-0.176	-0.283
	(0.182)	(0.210)
Religious group	-0.083	-0.362*
	(0.168)	(0.196)
Women group	0.116	0.178*
	(0.081)	(0.104)
VDC	-0.081	0.191
	(0.130)	(0.175)
Controls	Y	Y
Constant	0.309	0.980***
	(0.248)	(0.314)
Observations	1557	1557

*Standard errors in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01*

Underpinning engagement in these community groups was improved social empowerment among NJP participants, which was comparatively absent among non-NJP participants (Box 3). This points to transformative impacts through development of agency to challenge the social norms which disempower people in ultra-poverty. The sequence here was typically engagement in community groups paving the way for increased social ties, platforms, and confidence for social empowerment. Ritu (UPG+DRR+WASH, SE) noted that,

> *I learned to speak up when I got involved with the NGO and specially with the Nobo Jatra. Since I was a member of the 'village development committee,' I learned to speak out loud. I am also a member of 'city working group' formed by the union parishad…. They taught us about race discrimination. I am from Rishi community. We could not eat or drink from the same place as other Hindu people. They said that we should protest this. They said that we are human as other Hindu people. So we should not be discriminated. If there is an incident of discrimination, we can take legal help.*

Tanjila (UPG+WAS, SE) would also share her teachings with others in the community. This socialisation extended to the political arena. Respondents in a female FGD stated,

> *Now we can go to the chairman regarding our needs. After joining Nobo Jatra we have this courage. We went to the chairman and told him to repair the road in our village. Also went to collect donations for treatment of a poor person in our village. After joining the village development committee we became independent. Chairman takes us seriously and listens to us… We do a lot for the development of our village.*

Nobo Jatra's training and linking of markets and private service providers within UPG integrating iMSD was important in supporting transformative resilience capacities through community-level or group-based activities, according to the qualitative data. Ritu (UPG+DRR+WASH, SE) talked about the

[17] Zakat an act of piety through which one expresses concern for the well-being of fellow Muslims, as well as preserving social harmony between the wealthy and the poor.

[18] Where participant additionally feels they would be able to rely on the group for support during emergency.

enhanced access to markets enabled by Nobo Jatra, '*They said that we do not have to go from house to house to sell things, rather the wholesaler will come to our house*.' On the supply side, a private veterinary officer noted, '*We had some lacking in our knowledge before about these issues. Nobo Jatra gave us training in Khulna about these and the trainers taught us a great deal. We learned about how to help the Khamari (livestock farmers) to make more profit, and some basic ideas of how to treat the diseases of livestock*.' An input retailer added, '*For example, it is better to have food and water in separate bowls for cows. It is a simple change that many village people don't know about. This is an example of the kind of things we learn at training and in the end, reaps a notable result*.' This improved quality of market and extension services was an important enabling factor for households. The precise technical advice not only protected household assets and prevented impoverishment as noted in Section 4.3, but also helped nurture asset development in ways conducive to sustained escapes from poverty.

Box 3: Comparisons between NJP and non-NJP participants

We conducted a small number of interviews with non-NJP respondents as detailed in Section 3. Both NJP and non-NJP respondents had ups and downs in their poverty trajectories, but key differences are that NJP respondents were relatively better off especially in terms of adaptive and transformative resilience capacities. Three key differences emerged between these groups:

1) **The biggest difference observed was in terms of community-based engagement, which was lower among non-participants**. NJP respondents had a platform for speaking out and developed space in their families to voice opinions and participate in decision-making, often attributed to gender training that promoted cooperation and joint decision-making among spouses. This was a transformative resilience capacity. Instead, non-NJP respondents were less likely to develop social ties within the community: '*Speaking of relationship with my neighbours, well, they only come to our home when they have any special needs, and I too, don't go over to their places without a purpose. No (I don't go to meet them for chatting). My mother-in-law does not allow me to go anywhere… She wants me to stay at home all day long and that I need not socialise with anyone or go to anyone's house without a purpose.' (Non NJ4)*. The absence of social ties also extended to political support: '*Some households in that part of the village received support during the corona. But none of the households in this part of the village received any such support. Besides, the member only gave support to those with whom he had a good relationship. He was partial. Only my brother gave us some support at that time.' (Non NJ5)*

2) **Non-NJP respondents learned from NJP participants on smart agriculture and ways to look after poultry but were less effective, as they did not receive skills development training**: '*I tried to grow bottle gourd and vegetables in sacks but the result was not satisfactory. The plants dried up because I didn't use any fertilisers. I tried to copy what the Nobo Jatra members did but they knew many things I did not - for instance, they knew that the earth had to be mixed with fertiliser… You cannot grow plants in this manner simply by observation or from casual advice. There is a lot more to it. This time I will ask them to tell me in detail what I should do. I want to know why their plants flourish but mine don't.'* More generally, the intent to earn income, save, and collaborate with spouses to improve household income was relatively less embedded within non-participants, suggesting perhaps that coaching played an important part in overcoming psychosocial barriers and in this process strengthening adaptive resilience capacities.

3) **There were nevertheless some positive spillovers, especially in training engagement around WASH**. Some non-NJP respondents were able to remain involved in certain aspects of training: *'I went to learn how to wash my child's hands properly so that she does not catch any disease. I did not do this before. I learnt that I have to wash my hands before mixing my children's food… Before, when I fed them, they caught diarrhoea or fever. But after I learnt how to properly wash my hands, they*

didn't catch these diseases. I also taught my children how to wash their hands properly.' (INT2). This positive spillover thus improved anticipatory resilience capacities.

There was also a long-term planning perspective to NJP respondents, where they were increasingly keen to educate their children. Respondents learned to sign their names and some also began to understand what their children were studying and point out mistakes. Ritu (UPG+DRR+WASH, SE) notes that, '*from attending several trainings I realised that my life had gone to waste. I could not study but I will educate my son at any cost. If I have to beg I will do that, but I will educate him*.' This desire also extended to educating daughters. Bikis (UPG, TE) noted that she had no plans to marry off her 14-year-old daughter soon. Her daughter wanted to study medicine and Bikis stated that she would continue to let her study. Even so, Sanjida recognises that education alone was inadequate: '*Of course (you need money to get the job of a primary school teacher). However, if you are a child of a freedom fighter then you might get a job even if you are not as brilliant… Now I know only education is not enough.*'

5. Conclusion

This study sought to assess whether layering of a conventional UPG programme with interventions in iMSD, DRR, and WASH makes a difference in sustaining wellbeing outcomes over time, and amid climate and health shocks. The study interventions included a combination of UPG with iMSD, DRR, and WASH. Empirical results confirm that layering a UPG programme with interventions in iMSD, DRR, and WASH improves programme members' wellbeing by tackling chronic and ultra-poverty, enhances their resilience to shocks through capacity building, and contributes to progressive social change. The results are confirmed empirically via investigating three hypotheses:

Hypothesis 1: The results show that participation in UPG programme with iMSD is associated with absorptive and adaptive capacity that can tackle chronic poverty. We find that UPG livelihood interventions involving activities such as coaching, business development training, and entrepreneurship build up individual, household, and community resilience capacities to absorb and adapt to shocks and stressors. These activities tend to enhance resilience capacities by providing diversified livelihoods, knowledge, and skills, supporting the adoption and use of high yield crops and more productive or protective livestock rearing practices, and providing market linkages. In turn, they have been associated with pathways out of chronic poverty in the qualitative data and a higher probability of perception of income increases in the quantitative data. On the latter, UPG activities were associated with a higher probability of perception of income increase, by 17 percentage points among households self-reporting participation through access to extension services, up to 43 percentage points for participation in business development activities.

The results reaffirm the importance of integrated, gender-sensitive livelihood programmes to effectively tackle ultra-poverty and social inequality. Constraints that limit economic up-ward mobility of people in ultra-poverty are uniquely multidimensional and gendered. NJP interventions focused on women in ultra-poverty, many of whom are relatively older (47.2 years old on average, so 42-44 years at the time of the training) than the median age in the country (27.6 years) in 2020 (Statista, 2021). Bangladesh is a youthful nation in terms of its age structure. Interventions would need to be done by including discussions with mothers-in-law and husbands to support young women's economic inclusion, particularly in remote rural areas where young women may have less freedom to work outside the home.

At the same time, our qualitative results suggest that integrated programme can making too many demands and expectations on people in poverty with limited asset holdings. Though our study programme did not enforce participation in the different interventions, it may have been challenging both in terms of participants' time commitments for training and their ability to absorb and implement the teaching. Qualitative interviews revealed that many of the poorest participants were unable to

absorb some of the teaching, largely on account of low levels of education and poor health, coupled with limited physical infrastructure (e.g., the space needed for vegetable farming). Nonetheless, a majority of respondents recognised the strong value of the technical advice received in terms of protecting assets and income-generating activities, which helped troubleshoot problems.

Coaching and training elements were particularly valuable aspects of the UPG programme, as they offer tailored precise technical advice that are observed to contribute to the effectiveness of intervention areas. Going forward, participants and their households would further benefit from an assigned mentor who can work through constraints with them (flexibly outside of the scheduled coaching), work out how each set of interventions will work for them, and monitor post-training. A key question becomes how long the mentorship can be sustained. In this case, working with local mentors, such as a successful participant who is likely to stay in the village, may enable longer-term sustained improvements. Ali et al. (2021) conceive of this as a 'social worker cadre' of caseworkers in the country operating at local levels to ensure tailored support. This also relates to the general need to engage over longer periods of time beyond 'the projectisation of poverty reduction' especially when working with people in ultra- and extreme-poverty, such that programme and policy efforts are 'embedded in conducive political settlements based upon entitlements and rights ensured by progressive states' (Ali et al., 2021).

Hypothesis 2: The results indicate that shocks and stressors may lead to income loss and that DRR strengthens resilience capacities to anticipate and absorb those shocks to prevent households from falling back or deeper into ultra-poverty. The quantitative results show that training on DRR and receiving information on early warning systems are associated with a lower probability (by 19 percentage points) of income reduction in the years preceding the survey. The qualitative data suggest that increased awareness and access to risk information was an important anticipatory capacity to help prevent impoverishment or further declines in wellbeing, though sometimes inadequate to offset the increasingly vulnerable livelihood profiles of households in the context of climate change. The layering of DRR on to UPG was particularly notable in the context of climate change-related impacts such as floods and increased water salinity and is a combination which goes beyond other ultra-poor graduation programmes. Quantitative results furthermore point to access to WASH being associated with a lower probability (by 37 percentage points) of income loss, though qualitative insights highlight that it remains, on its own, inadequate in guarding against varied sources of ill health that can drive impoverishment.

In designing the poverty eradication programmes, a contextual analysis of factors that lead to impoverishment needs to be done, as well as changing patterns of livelihoods. Our analysis suggested that the livelihood changes over time in response to climate change has led some to shift to insecure livelihood options. For example, in one study site, reliance on Ghar (saltwater fish farming) had increased in intensity in recent years as a result of reduced profitability of paddy farming due to water salinity issues, though this shift had its risks when fish would escape during floods.

Our study also reveals that the integration and layering of NJP interventions, though highly useful, would further benefit from other forms of support. In the health sector, Nobo Jatra has already worked effectively with the government, private sector, community clinics, and different wings of community health services around WASH and maternal and child health and nutrition, which has contributed to improved access and quality of healthcare. Extending this collaboration to respond more effectively to other sources of ill health would help reduce a key source of impoverishment. For example, interventions around quality healthcare that is free at the point of delivery would be critical in preventing a key driver of continued impoverishment in rural Bangladesh (Diwakar et al., 2019). This first requires stronger financing in the health sector (Sakib, 2021). In the short term, home visits from health professionals or doctors' referrals could also help address a wider variety of ill health among people in ultra-poverty (BRAC, 2017).

Similarly, livestock insurance could also enable households to maintain asset holdings and more effectively employ livestock as a coping mechanism in times of distress, given the continued challenges experienced by participants in terms of flood-related livestock death and widespread livestock diseases. Another solution is to build more shelters for people and livestock during floods (The New Humanitarian, 2012), and strengthen veterinary services in coastal areas to account for contextual variations in disease prevalence. Relatedly, veterinary services should continue to focus on preventing outbreaks (Khatun et al., 2019), but alongside this also place more emphasis in consistently providing services to livestock owners who have sick livestock. Finally, effort needs to be placed on ensuring continued service delivery amid crises contexts, given the downward mobility many households in the qualitative data experienced during the pandemic period.

Hypothesis 3: Study findings suggest that transformative actions such as access to markets, participation in community loans savings groups, and encouraging social networks improves women's ability to experience sustained escapes from poverty. Results indicate that women who make major household decisions on their own or jointly with spouses have a higher probability (by 29 percentage points) of an increase in their incomes. Furthermore, when women join community savings groups and have access to funds, they are also more likely to experience an increase in their income. For example, engagement and access to VSL funds is associated with a higher probability (44 percentage points) that the household experienced an increase in their incomes in the five years preceding the survey.

The findings from this study reaffirm the importance of women's economic empowerment and tackling barriers to their participation. There continue to be challenges to women's engagement in public spheres. For example, some respondents noted adverse gender norms that discouraged some women from participating in Nobo Jatra and/or limited women's freedom of movement outside the household. Developing activities to strengthen women's economic empowerment is critical, but this needs to be done sensitively given that policies around asset ownership also touch on patriarchal clan, tribal, marital, and inheritance systems (Bird, 2017). Already, Nobo Jatra staff had discussions with all family members around the process of selection into the programme and for choosing income-generating activities as part of the programme focus. Going forward, building on this within a negotiated approach to norm change (Cooper, 2010) that engages with husbands, mothers-in-law, and local and religious leaders to highlight the advantages of women's inclusion, becomes critical to offer a contextualised and more sustainable means of women's empowerment.

There are other aspects that can support sustained poverty escapes alongside those discussed here, such as intra-household collaboration (which includes spousal collaboration), support to migrant workers, a financial inclusion ladder, upgraded business development skills, and children's education through a critical number of years (with necessary support for girls). The economic environment is also important and can be made more supportive for people in poverty through minimum wage rises, improved conditions for migrants, and a pro-poor economic growth environment (Shepherd et al., 2019), which is also relevant in rural Bangladesh (Scott and Diwakar, 2016). Working with key local and national decision-makers to enhance the social and economic environment and maintain these improvements during crises will be an important component in continuing to foster sustained pathways out of ultra-poverty.

References

Adnan, M.S.G., Abdullah, A.Y.M., Dewan, A. and Hall, J.W. (2020) 'The effects of changing land use and flood hazard on poverty in coastal Bangladesh' *Land Use Policy* 99: 104868 (www.sciencedirect.com/science/article/abs/pii/S0264837720305470).

Ahmed, B., Kelman, I., Fehr, H.K. and Saha, M. (2016a) 'Community resilience to cyclone disasters in coastal Bangladesh' *Sustainability* 8(8): 805 (www.mdpi.com/2071-1050/8/8/805/htm) .

Ahmed, N., Bhuyan, H., and Basher, A. (2016b) Inclusive market development in the agriculture sector of Bangladesh: challenges and opportunities. Katalyst.

Akter, S., and Basher S. (2014) 'The impacts of food price and income shocks on household food security and economic well-being: evidence from rural Bangladesh' *Global Environmental Change* 25: 150-162.

Akter, S., & Mallick, B. (2013). The poverty–vulnerability–resilience nexus: Evidence from Bangladesh. *Ecological Economics*, *96*, 114-124. https://www.sciencedirect.com/science/article/abs/pii/S0921800913003182

Alam, K. and Rahman, M.H. (2019) 'Post-disaster recovery in the cyclone Aila affected coastline of Bangladesh: women's role, challenges and opportunities' *Natural Hazards* 96(3): 1067-1090 (https://link.springer.com/article/10.1007/s11069-019-03591-7).

Ali, I. and Hatta, Z.A. (2014) 'Zakat as a poverty reduction mechanism among the Muslim community: case study of Bangladesh, Malaysia, and Indonesia' *Asian Social Work and Policy Review* 8: 59–70 (https://doi.org/10.1111/aswp.12025).

Ali, Z., Ahmed, B., Maitrot, M., Devine, J., and Wood, G. (2021) *Extreme poverty: the challenges of inclusion in Bangladesh*. BIDS (https://bids.org.bd/uploads/research/completed_research/FINAL_Challenges%20of%20Inclusion_With%20LOGOS%20_28%20September%202021_Revised.pdf).

Altaf, A. (2019) *The many hidden faces of extreme poverty: inclusion and exclusion of extreme poor people in development interventions in Bangladesh, Benin and Ethiopia*. Leiden: African Studies Centre Leiden.

Andrews, C., de Montesquiou, A., Sánchez, I. A., et al. (2021) *The state of economic inclusion report 2021: the potential to scale*. World Bank (www.peiglobal.org/sites/pei/files/2021-01/SEI%20Report%202021%20-%20Overview.pdf).

Ayeb-Karlsson, S., van der Geest, K., Ahmed, I., Huq, S., & Warner, K. (2016). A people-centred perspective on climate change, environmental stress, and livelihood resilience in Bangladesh. *Sustainability Science*, *11*(4), 679-694. https://link.springer.com/article/10.1007/s11625-016-0379-z

Bahadur, A, Peters, K, Wilkinson, E, Pichon, F, Gray, K, Tanner, T (2015). The 3As: Tracking Resilience Across BRACED. London: ODI.

Barkat, A., Yasmin, R., Siddiquee, M.S.H., and Ahamed, F.M. (2019) Report on graduation assessment of Nobo Jatra. Internally shared document.

Barrett, C., and Constas, M. (2014) 'Toward a theory of resilience for international development applications' *PNAS* 111(40): 14625–14630.

Baulch, B. and Davis, P. (2008) 'Poverty dynamics and life trajectories in rural Bangladesh' *International Journal of Multiple Research Approaches* 2(2): 176–190 (https://doi.org/10.5172/mra.455.2.2.176).

BRAC (2017) *BRAC's Ultra-Poor Graduation Program: an end to extreme poverty in our lifetime*. BRAC report. (www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2017/04/Lamia-Rashid-BRAC-Ultrapoor-Graduation-Paper-for-UN-Expert-Group-Meeting-May-2017-25Apr17.pdf).

Cash, R.A., Halder, S.R., Husain, M., et al. (2013) 'Reducing the health effect of natural hazards in Bangladesh' *The Lancet* 382(9910): 2094–2103 (www.sciencedirect.com/science/article/abs/pii/S0140673613619480).

Choularton, R. (2021, June 23). Developing inclusive market systems-based approaches to climate change adaptation. *Climate Links*: https://www.climatelinks.org/blog/developing-inclusive-market-systems-based-approaches-climate-change-adaptation

Davis, P. (2007) *Discussions among the poor: Exploring poverty dynamics with focus groups in Bangladesh*. Chronic Poverty Research Centre Working Paper 84 (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1653340).

Davis, P. (2011) *Escaping poverty: patterns and causes of poverty exits in rural Bangladesh* (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1896137).

Devine, J, and Wood, G. (2011) *Extreme poverty and the need for a new political settlement. The case of Bangladesh*. EPRG Working paper 26 (https://assets.publishing.service.gov.uk/media/57a089dbe5274a27b20002d1/26-Political-Resettlement.pdf).

Emran. M.S., Robano, V., and Smith, S.C. (2014) 'Assessing the frontiers of ultrapoverty reduction: evidence from challenging the frontiers of poverty reduction/targeting the ultra-poor, an innovative programme in Bangladesh' *Economic Development and Cultural Change* 62(2).

Gradl, C. and Knobloch, C. Inclusive Business Guide, 2010, ENDEVA (Enterprise Solution for Development), Brunnenstr 192, Berlin.

Hill, R.V. and Genoni, M.E. (2019) Bangladesh poverty assessment: facing old and new frontiers in poverty reduction, Volume 2, Background Papers.

Hoque, M.Z., Cui, S., Lilai, X., Islam, I., Ali, G., and Tang, J. (2019). Resilience of coastal communities to climate change in Bangladesh: research gaps and future directions. *Watershed Ecology and the Environment 1*: 42-56.

Hossain, M. and Nargis, N. (2009) 'Dynamics of poverty in rural Bangladesh, 1988-2007: an analysis of household level panel data'. In *Conference on Employment, Growth and poverty reduction in developing countries*: 27–28 (https://bigd.bracu.ac.bd/publications/dynamics-of-poverty-in-rural-bangladesh-1988-2007-an-analysis-of-household-level-panel-data).

Hossain, M. A., Ahmed, M., Ojea, E., & Fernandes, J. A. (2018). Impacts and responses to environmental change in coastal livelihoods of south-west Bangladesh. *Science of the total environment*, *637*, 954-970. https://www.sciencedirect.com/science/article/abs/pii/S0048969718315067?via%3Dihub

ICAI – Independent Commission for Aid Impact (2017) 'The effects of DFID's cash transfer programmes on poverty and vulnerability: an impact review' (https://icai.independent.gov.uk/wp-content/uploads/ICAI-Review-The-effects-of-DFID's-cash-transfer-programmes-on-poverty-and-vulnerability-2.pdf).

IPA (2020) Poverty Probability Index for Bangladesh. Innovations for Poverty Action, Washington DC (www.povertyindex.org/country/bangladesh).

Islam, M.S. and Alam, K. (2018) 'Does social capital reduce poverty? A cross-sectional study of rural household in Bangladesh' *International Journal of Social Economics* 45(11) (https://doi.org/10.1108/IJSE-07-2017-0295).

Islam, M. T., & Nursey-Bray, M. (2017). Adaptation to climate change in agriculture in Bangladesh: The role of formal institutions. *Journal of environmental management*, *200*, 347-358. https://www.sciencedirect.com/science/article/pii/S0301479717305777?via%3Dihub

Islam, R., Walkerden, G., & Amati, M. (2017). Households' experience of local government during recovery from cyclones in coastal Bangladesh: resilience, equity, and corruption. *Natural Hazards*, *85*(1), 361-378.https://link.springer.com/article/10.1007/s11069-016-2568-6

Kabir, M. J., Cramb, R., Alauddin, M., Roth, C., & Crimp, S. (2017). Farmers' perceptions of and responses to environmental change in southwest coastal Bangladesh. *Asia Pacific Viewpoint*, *58*(3), 362-378. https://onlinelibrary.wiley.com/doi/pdf/10.1111/apv.12165

Kamal, A. M., Shamsudduha, M., Ahmed, B., Hassan, S. K., Islam, M. S., Kelman, I., & Fordham, M. (2018). Resilience to flash floods in wetland communities of northeastern Bangladesh. *International journal of disaster risk reduction*, *31*, 478-488. https://www.sciencedirect.com/science/article/abs/pii/S2212420917304089

Khatun, M., Islam, M. and Rahman, M. (2019) 'Current status of veterinary public health activities in Bangladesh and its future plans' *BMC Veterinary Research* 15: article 164.

Kundu, S., Kabir, M. E., Morgan, E. A., Davey, P., & Hossain, M. (2020). Building Coastal Agricultural Resilience in Bangladesh: A Systematic Review of Progress, Gaps and Implications. *Climate*, *8*(9), 98. https://www.mdpi.com/2225-1154/8/9/98/htm

Maitrot, M., Wood, G., and Devine, J. (2021) 'Understanding resilience: lessons from lived experiences of extreme poverty in Bangladesh' *Development Policy Review* 39(6): 894–910 (https://doi.org/10.1111/dpr.12543).

Mallick, B., Ahmed, B., & Vogt, J. (2017). Living with the risks of cyclone disasters in the south-western coastal region of Bangladesh. *Environments*, *4*(1), 13. https://www.mdpi.com/2076-3298/4/1/13/pdf

Marsden, H. (2011) *Targeting the extreme poor: learning from Shiree*. Dhaka: EPRG (https://assets.publishing.service.gov.uk/media/57a08ad6e5274a27b20007c9/Shiree-WP1.pdf).

Matin, I., Sulaiman, M., and Rabbani, M. (2008*) Crafting a graduation pathway for the ultra poor: lessons and evidence from a BRAC programme*. Chronic Poverty Research Centre Working Paper No. 109.

Misha, Raza, W.A., Ara, J. and van de Poel, E. (2019) 'How far does a big push really push? Long-term effects of an asset transfer programme on employment trajectories' *Economic Development and Cultural Change* 68(1): 41–62 (https://doi.org/10.1086/700556).

Mottaleb, K. A., Mohanty, S., Hoang, H. T. K., & Rejesus, R. M. (2013). The effects of natural disasters on farm household income and expenditures: A study on rice farmers in Bangladesh. *Agricultural Systems*, *121*, 43-52. https://www.sciencedirect.com/science/article/abs/pii/S0308521X13000735?via%3Dihub

Nadim, S.J. and Nurlukman, A.D. (2017) 'The impact of women empowerment on poverty reduction in rural area of Bangladesh: Focusing on village development program' *Journal of Government and Civil Society* 1(2): 135–157 (http://jurnal.umt.ac.id/index.php/jgs/article/download/444/658).

Quisumbing, A. R. (2011) *Do men and women accumulate assets in different ways? Evidence from rural Bangladesh*. IFPRI Discussion Papers (1096) (https://ideas.repec.org/p/fpr/ifprid/1096.html).

Rahman, H. and Hill, R. (2019) 'Poverty in urban Bangladesh' *The Bangladesh Development Studies* 42(2/3): 131–171.

Ray-Bennett, N. S., Collins, A., Bhuiya, A., Edgeworth, R., Nahar, P., & Alamgir, F. (2010). Exploring the meaning of health security for disaster resilience through people's perspectives in Bangladesh. *Health & place*, *16*(3), 581-589. https://www.sciencedirect.com/science/article/abs/pii/S1353829210000043

Raza, W., Das, N. and Misha, F. (2012) 'Can ultra-poverty be sustainably improved? Evidence from BRAC in Bangladesh' *Journal of Development Effectiveness* 4(2): 257–276.

Robano, V., and Smith, S.C. (2013) *Multidimensional targeting and evaluation: a general framework with an application to a poverty programme in Bangladesh*. IZA Discussion Paper No. 7593, (https://ssrn.com/abstract=2325851).

Roy, B., Ullah, M., and Rahman, M. (2015). Climate change impact in *Char* lands in central area of Bangladesh: assessing vulnerability and adaptation by the farming communities. *Journal of Environmental Science and Natural Resources 7(2):* 59-63.

Sabates-Wheeler, R., Sabates, R. and Devereux, S. (2018) 'Enabling graduation for whom? Identifying and explaining heterogeneity in livelihood trajectories post-cash transfer exposure.' *Journal of International Development* 30: 1071–95.

Sakib, S. (2021) 'Bangladeshis' woes deepen amid lack of health coverage', Andalou Agency website, 30 April (www.aa.com.tr/en/asia-pacific/bangladeshis-woes-deepen-amid-lack-of-health-coverage/2225330).

Sarker, M.N.I., Wu, M., Alam, G.M., and Shouse, R.C. (2020) 'Administrative resilience in the face of natural disasters: Empirical evidence from Bangladesh' *Disasters* 6(7) (www.pjoes.com/Administrative-resilience-in-the-face-of-natural-disasters-Empirical-evidence-from,109527,0,2.html).

Scott, L. and Diwakar, V. (2016). Ensuring escapes from poverty are sustained in rural Bangladesh. LEO Report, USAID.

Self, V., Schofield, L., and Ahmed, M. (2018) *Graduation out of extreme poverty: who, why and how? Evidence from Save the Children's Shiree Programme in Bangladesh*. Save the Children (https://resourcecentre.savethechildren.net/node/13518/pdf/shiree_learning_paper_full_version.pdf).

Siddiquee, M. (2019) 'Heterogeneous effects on well-being: evidence from graduation model in Bangladesh' *Social Science Review* 36(2).

Skakun, Z., Smyth, I., & Minne, V. (2021). Gender-Transformative Resilience Programming: Experiences from Bangladesh and Myanmar. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/621195/rr-gender-transformative-resilience-programming-140421-en.pdf%3bjsessionid=BFCA32BBFD3612B3822FE60330316756?sequence=1

Sultana, P., Thompson, P. M., & Wesselink, A. (2020). Coping and resilience in riverine Bangladesh. *Environmental Hazards*, *19*(1), 70-89. https://www.tandfonline.com/doi/abs/10.1080/17477891.2019.1665981

Tanner, T., Gray, B., Guigma, K., et al. (2019) *Scaling up early action*. *Lessons, challenges and future potential in Bangladesh*. ODI Working Paper 547. London: ODI (www.anticipation-hub.org/Documents/Research_Reports/Scaling_up_early_action_Lessons__challenges_and_future_potential_in_Bangladesh.pdf).

Tateno, Y., and Zoundi, Z. (2021) *Estimating the short-term impact of the COVID-19 pandemic on poverty in Asia-Pacific LDCs*. UNESCAP (www.unescap.org/sites/default/d8files/2021-03/Technical%20note_Estimating%20COVID%20impact%20on%20poverty%20in%20APLDCs_final.pdf).

The New Humanitarian (2012) Bangladesh: cyclone shelters – for livestock too. Preventionweb website (www.preventionweb.net/news/bangladesh-cyclone-shelters-livestock-too).

Thomalla, F., Cannon, T., Huq, S., Klein, R. J., & Schaerer, C. (2005). Mainstreaming adaptation to climate change in coastal Bangladesh by building civil society alliances. In *Solutions to Coastal Disasters 2005* (pp. 668-684). https://pubs.iied.org/sites/default/files/pdfs/migrate/G00016.pdf

Titumir, R.A.M. (2021) 'Poverty and inequality in Bangladesh'. In *Numbers and Narratives in Bangladesh's Economic Development*. Palgrave Macmillan: 177–225.

Tofail, F., Fernald, L.C., Das, K.K., et al. (2018) 'Effect of water quality, sanitation, hand washing, and nutritional interventions on child development in rural Bangladesh (WASH Benefits Bangladesh): a cluster-randomised controlled trial' *The Lancet Child & Adolescent Health* 2(4): 255–268 (www.sciencedirect.com/science/article/pii/S2352464218300312).

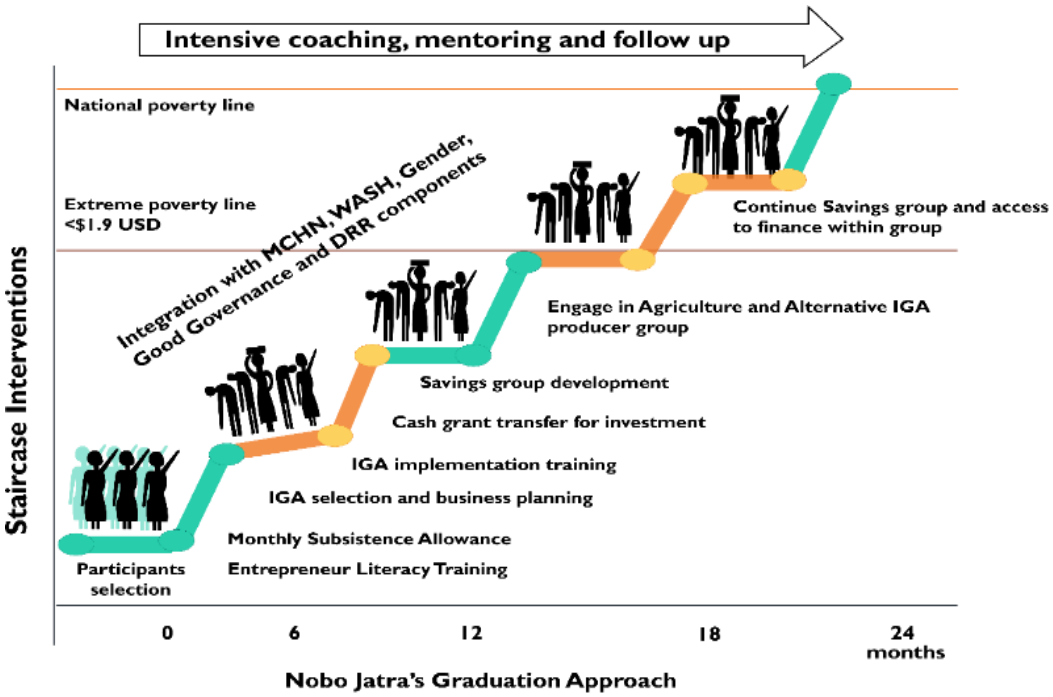
World Vision (2022) Inclusive market systems development (iMSD) in brief. World Vision (www.worldvision.com.au/docs/default-source/seed-docs/wva-imsd-5-page-overview-2020-final.pdf).

Annexes

Annex A: Summary of the Nobo Jatra programme model

Note: This summary is extracted from excerpts of Nobo Jatra document shared by World Vision.

Figure A1: Overview of UPG interventions



All participants took part in a UPG-specific sequence of interventions within a set timeframe that consisted of 24 months for cohort 1 and 2, and 18 months for cohort 3. The sequence of activities included:

- Entrepreneurial literacy training – basic literacy numeracy, core business skills
- Cash transfers of $12 per month for nine months
- IGA training – relevant to skills and context, three months intense mentoring
- Asset transfer $188 – start-up capital for enterprises, mobile transfer
- VSLAs to encourage participation in savings group and ownership of savings account in formal financial institution
- Intensive coaching, mentoring, and follow up
- Coaching and mentoring at household and group level. In Cohort 1, after several months of training, respondents became eligible for cash grant support for asset development. At this time, they had individual coaching and mentorship that continued to the end of the 24-month period. In subsequent cohorts, coaching began at the start of the programme, twice a month. Coaching took place at a fixed date for participants, with participants working with the same individual mentor throughout the programme.

All participants were based in study areas or participated in interventions around inclusive market systems development through NJP:

- Climate-smart agriculture – lead farmers manage plots and generate demand
- Capacity building for local service providers – agricultural advisors to producer groups, access for smallholders via LSPs to extension services/ agro-vets/ input suppliers and buyers
- Linkages with lead firms for both crop and livestock services (inputs)

- Incentivising the private sector companies to reduce risk, market entry barriers, and transaction cost
- Organising buyer/seller (participants and private sector) linkage meetings
- Engaging private sectors in providing embedded technical knowledge and information

In addition, some participants belonged to a DRR intervention group, others to a WASH intervention group, and some belonged to both groups. Details of differentiating factors between these groups are outlined below. As noted above, all NJP participants across intervention groups took part in UPG and iMSD activities.

Key interventions under DRR component:

- Adequate financial and human resources with the Disaster Management Committees (DMCs) and relevant institutions to implement and manage the DRR actions
- Functioning DMCs by means of appropriate systems and tools for efficient implementation and management of disaster preparedness and response activities for the local communities
- Effective partnership and collaboration among public, private, and civil society DRR actors at local, sub-national, and national levels
- Support DMCs with adequately trained youth volunteers and students
- Mobilise and educate communities on DRR activities through videos and day observation
- Bridge VDCs and other Nobo Jatra groups like YCs, WMCs and VSLAs with DMCs to contribute to their system strengthening and functionality
- Train and mobilise VDC representatives to participate and oversee RRAP development and implementation in partnership with DMCs

Key interventions under WASH component:

- WASH and Nutrition Social Behaviour Communication (SBC): essential hygiene practices promoted through SBC focusing messages on 1) baby WASH; 2) hand washing with soap; 3) safe drinking water; 4) water treatment; 5) waste and faecal management; 6) safe sanitation; 7) exclusive breastfeeding, pre- and post-natal care and positive nutrition practice.
- Water facilities and latrines: in coordination with relevant government departments, committees, and communities, Nobo Jatra has provided latrines to households in ultra-poverty and developed water facilities such as tube wells, pond sand filters, rainwater harvesting systems, and plants to increase access to safe drinking water.
- Strengthening Water and Sanitation (WatSan) committees: Through capacity building and mentoring, Nobo Jatra strengthens Upazila, Union, and Ward level WatSan committees to sustainably plan, monitor, and report on WASH progress in their jurisdictions, mobilise resources through joint action planning, and promote essential hygiene practices.
- Water Management Committee (WMC) for water point's maintenance: Each water system established/rehabilitated by Nobo Jatra is served by a fully functioning Water Management Committee responsible for maintenance of water points, community-based fund generation, mitigation of water pollution, record keeping, water safety plans, water quality tests, and monitoring of water points.

Annex B: Summary of qualitative study sites

Bazargram village of Kushuliya Union was peri-urban in terms of location as it was closer to the Kaliganj Upazila, compared to the other two villages. It included various 'gher' and brickfields and was next to the river with prolonged waterlogging. Most respondents lived in govt *khas* land and there was a big 'dalit' community but with little communal tension. Tarali was a rural location and only had 'gher', and

partly as a result was more vulnerable to climate shocks and stressors. It also was poorer and had less educated respondents compared to the other two sites. Paniya village had cultivable land, waterlogging did not affect homes, it had brick roads, pucca buildings (schools, mosques, graveyard and was relatively better off. Kaliganj MP belongs to Paniya, which may help explain some of this comparative development.

Dwelling: tenancy status of the dwelling land has surfaced as a major indicator of the wealth division and choice of livelihoods. Most of the people in these sites do not own any land or productive assets. In the absence of a dwelling land, they are found to build their houses on government fallow land. In some cases, they inherited the right to live on these lands, of which their ancestors took possession illegally, and in others, they either are paying rent to or bought the right to live on that land from the illegal possessors, who are often local influential figures. People with limited resources and power are at high risk of eviction as they do not have any legal claim on this type of land. This can also in turn affect their economic relations with landowners, for example in terms of lower remuneration for day wage labour on farms of richer owners.

Livelihoods: there is little variation in the occupation types of the people among the three villages. Most of the villagers, according to FGD respondents, work as day labourers in brick kilns, fish depots *(aarot)*, shrimp enclosures, and agricultural lands owned by the relatively richer people. The wage rates do not vary a lot across different occupations within a village but there are some differences across villages. The wage rates for both men and women are the lowest ones in Bazargram, where women and men get 120-150 tk and 250 tk respectively. Whereas, people of Tarali and Paniya villages have a rate of 250 tk for women and 400 tk for men for a full day of work. Villagers find little scope to negotiate the wage rate with the employers, on account of an oversupplied labour market, along with their insecure access to dwelling land, as noted above, and poor links to influential political people. A few people endeavoured to cultivate fingerlings and shrimp in the enclosures they leased from others. Cultivating fish in the enclosures and brick kilns are seasonal livelihood options. Most of them thus also pull vans or work in others' fields, or work as construction labourers, electric mechanics, and painters at construction sites nearby or in other places.

Gender: women were found to work both inside and outside of the home to meet the expenses of the family. Most of the women work in shrimp enclosures, fields, and brick kilns. The employers give less money to women, claiming they are not as efficient and skilled as their male counterparts. A common mentality in all these three villages is that women lose their dignity if they work outside, though people understand if a woman has to work to sustain her family. Even so, if someone wants to work in areas outside the village, they are bad-mouthed, and there were instances reported of sexual harassment and rape. Despite these issues, many women who are married and a bit older go to the kilns to work as cooks. Men often go to bigger cities or foreign countries for livelihood purposes. Women also work in the 40-day long government road construction projects and people's houses as domestic help. Some women who want to earn some money while being at home choose tailoring and poultry raising, but some respondents from Bazargram share that nowadays women can hardly do that because poultry dies due to different diseases, disasters, and wet/damp weather.

Training and education: though there are some opportunities to get livelihood training provided by the Department of Women at the Upazilla, the programmes require the trainees to at least pass the 8th grade, which is uncommon among older women and a lot of young girls who dropped out of school when they closed in the long lockdown. This discontinuation of studies also happened for school-going boys. Several school-going girls from the villages were married off before they turned 18, which according to some respondents in Paniya, was to prevent the formation of romantic relations between unmarried boys and girls.

Change for and by women: key areas of change identified for women were more freedom in their movement and occupation; increased participation in the household decision-making process, where women now have more say than in the past; and an increase in knowledge about WASH, sanitation, pre and neonatal care, and disaster preparedness. Women across the three villages asserted that now women are actively looking for ways to increase household earnings and savings, which is helping them to improve their position within the households.

Nutrition: most of the people in the surveyed villages can have three meals a day, which typically excludes chicken or fish and is nutritionally deficient. Except for the rich people, many cannot afford chicken or fish more than once a month. Those who worked in the fish market would often get some fish besides their regular wages, but this stopped as soon as the pandemic hit, since the fish market was practically closed and people were out of work for many months. This is also true for the farmers who used to receive crops after the harvest in exchange for their work, but could not find work once the pandemic started. Even when men move to other areas to earn money, their families left behind often struggle for food as there is little money and women cannot go to the market to buy necessary items. In the face of suffering, the households can hardly share their struggle with their neighbours to maintain their social image. Apart from food scarcity, drinkable water is also not often available, due to arsenic and salinity, so people either buy water at a 2 tk/litre rate or collect it from the water tanks established by various NGOs and organisations including the Nobo Jatra programme and Social Development Fund (SDF).

COVID-19: the respondents mentioned they can meet the day-to-day necessities but are unable to save for the future, since all the income they earn is used for daily expenses, thus reversing some of the gains made by the NJP intervention. The income and health shock of COVID-19 has worsened the situation, as husbands of many households have lost their jobs and children had to stop studying since private tuition was getting too costly. Many families in the villages, especially households in ultra-poverty, had to take loans from different NGOs and *Shomiti*s like UPG *Baksho Shomiti* to meet health and food expenses which they sought after depleting their savings and selling productive assets like cattle, poultry, land, etc. Those who were not eligible for institutional loans tried to get loans from the local loan sharks who often demanded valuable assets like gold jewellery as liens, which most families in ultra-poverty do not possess. Recovering from the losses due to COVID-19 will be very hard and time-consuming, a shared belief among the respondents. However, the pandemic was not the only external shock the villagers were struggling with. Many mentioned natural disasters like storms and floods to be one of the major impediments in their way of improvement, since these foil their attempts to save or sustain existing assets, like cattle and poultry that get lost, sick, or die.

Table 1: Sampling distribution of the LHIs

Village	Poverty trajectory	UPG	UPG+ DRR	UPG+ WASH	UPG+DRR+ WASH	Non-NJP	Total
Bazargram	TE	1	2	2	1	2	13
	SE	2	1	1	1		
Paniya	TE	0	2	2	0	1	14
	SE	3	2	1	3		
Tarali	TE	0	2	1	2	2	13
	SE	2	3	0	1		

Annex C: Summary of sampling design and power calculations

In light of the assessment for treatment and control groups using a cross-section survey, the sample included households split into groups of treatment and control households. Accordingly, the sampling design included comparable households of 'case' and 'control' groups in this cross-section survey.

The size of the sample was determined taking into account the desired level of confidence in the estimated impacts and the likely proportion of programme participants (ultra-poor) households in the overall population. Once the values of these two parameters were determined, the desired size of the sample was obtained using the following statistical formula account for the estimated population proportion, design effect, and the confidence interval required to yield an estimate with a specified margin of error:

n = (p (1−p)$*deff*$*z* z)) / (e*e) (1)

where,

n = sample size

p = the proportion of success for the indicator – estimated proportion of the population that presents the characteristic in this case

q = 1 – p

$deff$ = design effect

z = level of confidence according to the standard normal distribution (the value of z = 1.96 at 95% confidence level)

e = the desired degree of precision or the extent of admissible error in the estimates

Since the value of p is unknown (the prevalence of the core indicator), it is common practice in the literature to assume p to be 0.5 (50 percent), which gives the maximum variance of the estimator of proportion and in turn the maximum value of sample size (n). With respect to the choice of e, the extent of admissible error in the estimates, we hole the value at 5.0%, coupled with the value of z of 1.96 for a 95.0% confidence level. As households in each stratum were to be selected randomly from the different arms (not be clustered by village), there was no need for correction for cluster effect. Consequently, the cluster-effect factor was considered 1 as it is in simple random sampling. Using these values in the aforementioned equation, the formula for the sample size yields a value of 384.16.

n = (0.5(1−0.5)*1.0*1.96 * 1.96) / (0.05*0.05) = 384.16 (2)

This was the size of the sample for each of the treatment and control groups. In light of possible attrition due to refusal, no-show, or other forms of non-response, we further increased each sample using a 6.0% adjustment. Our final sample for each of the treatment and control groups, therefore, comprises 408 (407.2096) households. Overall, the size of the entire sample was 1,632 (4×408).

Table C1: Sample Size calculation

Survey component	z	P	q=1-p	E	n	Cluster Size	Deff	Attrition factor	n after attrition factor	#Arms	Final Sample size
Treatment arms	1.96	0.5	0.5	0.05	385	X	1.0	1.06	408	3	1224
Control arm	1.96	0.5	0.5	0.05	385	X	1.0	106	408	1	408
Total Sample										4	1632

Annex D: Summary statistics and additional regression tables

Table D1: Summary stats for socio-demographic variables, by Cohorts

	Cohort1		Cohort2		Cohort3	
	Mean	SD	Mean	SD	Mean	SD
Female head	0.74	0.44	0.74	0.44	0.77	0.42

Age of head	42.46	10.21	42.63	11.13	43.73	10.69
Household size	4.01	1.65	3.95	1.53	3.99	1.49
No education of head	0.45	0.50	0.44	0.50	0.40	0.49
Primary education of head	0.30	0.46	0.28	0.45	0.33	0.47
Secondary education & above of head	0.25	0.44	0.28	0.45	0.27	0.44
Female Agency	0.96	0.20	0.96	0.20	0.97	0.16
Remittances	0.20	0.40	0.21	0.41	0.21	0.41
Agriculture as primary income	0.43	0.49	0.43	0.50	0.48	0.50
Informal employment as primary income	0.55	0.50	0.54	0.50	0.50	0.50
Formal employment as primary income	0.02	0.15	0.03	0.17	0.02	0.14
Observations	737		862		325	

Table D2: Summary Outcomes by Cohorts

	Cohort1		Cohort2		Cohort3	
	Mean	SD	Mean	SD	Mean	SD
Asset index	-0.05	0.86	0.04	1.07	0.01	1.08
Poverty Likelihood	36.93	18.70	36.30	18.43	38.24	19.16
% hh- income remained same	0.12	0.32	0.11	0.31	0.13	0.34
% hh- income increased	0.79	0.41	0.75	0.43	0.74	0.44
% hh- income decreased	0.09	0.29	0.14	0.35	0.13	0.34
Improved water source	0.35	0.48	0.38	0.49	0.30	0.46
Improved sanitation facilities	0.95	0.22	0.95	0.21	0.93	0.26
Preparedness against current shocks	0.76	0.43	0.77	0.42	0.80	0.40
Preparedness against future shocks	0.95	0.22	0.95	0.22	0.95	0.21
Household Food Insecurity	4.73	2.63	4.32	2.44	4.14	2.70
Observations	737		862		325	

Table D3: Relationship between layered interventions and household wellbeing

UPG+DRR	Model (1) Asset Index	Model (2) PPI	Model (3) Income increase	Model (4) Income decrease	Model (5) HFIAS
UPG+DRR	0.086	-1.668**	-0.239**	0.207	-0.040
	(0.072)	(0.818)	(0.108)	(0.127)	(0.185)
UPG+WASH	0.008	-0.765	-0.089	0.183	-0.040
	(0.061)	(0.753)	(0.102)	(0.118)	(0.171)
UPG+DRR+WASH	0.224***	-1.999**	-0.231**	0.105	0.135
	(0.085)	(0.879)	(0.117)	(0.139)	(0.203)
Female	0.270***	0.848	0.139	-0.127	-0.323**
	(0.055)	(0.655)	(0.091)	(0.105)	(0.158)
Age	0.001	-0.066**	0.001	0.003	-0.008
	(0.002)	(0.027)	(0.004)	(0.004)	(0.006)
Household size	0.022	8.256***	0.005	-0.012	0.097**
	(0.016)	(0.270)	(0.025)	(0.028)	(0.042)
Primary education	0.026	0.136	0.131	0.035	-0.180
	(0.055)	(0.701)	(0.089)	(0.102)	(0.152)
Secondary & higher	0.209***	-11.735***	0.263***	-0.158	-0.491***
	(0.075)	(0.719)	(0.098)	(0.116)	(0.170)
Cohort 2	0.037	0.437	-0.060	0.234**	-0.405***
	(0.053)	(0.614)	(0.082)	(0.098)	(0.140)
Cohort 3	-0.008	-1.040	-0.151	0.283*	-0.476**
	(0.090)	(1.016)	(0.128)	(0.152)	(0.223)
Upazila4753	-0.065	-0.223	0.033	0.072	0.051
	(0.062)	(0.899)	(0.115)	(0.133)	(0.195)
Upazil8747	0.515***	-14.167***	0.047	-0.108	-0.242
	(0.084)	(0.817)	(0.105)	(0.123)	(0.186)

Upazila8786	0.207***	-11.596***	0.062	0.029	-0.100
	(0.067)	(0.802)	(0.102)	(0.119)	(0.171)
Access to funds	0.123*	-0.056	0.478***	-0.416***	0.137
	(0.067)	(0.829)	(0.104)	(0.114)	(0.196)
Remittances	0.066	-0.353	-0.029	-0.141	0.034
	(0.068)	(0.659)	(0.092)	(0.111)	(0.159)
Business & informal employment	0.103**	-0.730	0.068	-0.080	-0.000
	(0.051)	(0.569)	(0.074)	(0.085)	(0.127)
Formal employment	0.060	-1.821	0.099	-0.128	0.052
	(0.146)	(1.561)	(0.225)	(0.279)	(0.366)
Floods	-0.115*	0.501	-0.248***	0.305***	0.436***
	(0.066)	(0.640)	(0.090)	(0.108)	(0.158)
Droughts	0.045	0.372	-0.490***	0.189	0.663***
	(0.087)	(0.947)	(0.119)	(0.148)	(0.227)
Landslides	-0.185**	1.815	-0.075	0.014	0.119
	(0.076)	(1.117)	(0.142)	(0.168)	(0.246)
Erosion	-0.003	-0.578	0.158	-0.101	-0.531**
	(0.089)	(0.952)	(0.135)	(0.158)	(0.229)
Fire & wind	-0.119	-0.550	-0.038	-0.009	-0.483
	(0.105)	(1.483)	(0.186)	(0.218)	(0.364)
Earthquakes	-0.069	1.331	0.054	-0.406**	-0.364*
	(0.071)	(0.936)	(0.120)	(0.167)	(0.198)
Livestock diseases	-0.029	-0.303	0.157**	-0.090	0.409***
	(0.049)	(0.556)	(0.075)	(0.087)	(0.127)
Crop pests	0.109	-1.301	0.515***	-0.353**	-0.584**
	(0.094)	(1.011)	(0.156)	(0.180)	(0.255)
Deaths & illness	0.019	-0.449	0.010	-0.028	0.532***
	(0.054)	(0.567)	(0.075)	(0.087)	(0.130)
Constant	-0.724***	16.715***	0.294	-1.098***	4.472***
	(0.135)	(1.971)	(0.247)	(0.287)	(0.426)
Observations	1563	1558	1563	1563	1563