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Bangladesh Resilience Research Report- Final

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Acronyms

C4R	Center for Resilience
CSI	Coping Strategy Index
FANTA	Food and Nutrition Technical Assistance Project
FFP	Food for Peace
HDDS	Household dietary diversity score
HH	Household
HKI	Helen Keller International
ICF	ICF International
OLS	Ordinary least squares
SAPLING	Sustainable Agriculture and Production Linked to Improved Nutrition Status, Resilience, and Gender Equity
SHOUHARDO3	Strengthening Household Ability to Respond to Development Opportunities
USAID	United States Agency for International Development

Executive Summary

The objective of this research is to provide implementing partners, Food for Peace (FFP) and the United States Agency for International Development (USAID) with insights into factors that strengthen household and community resilience in Bangladesh. This report complements the Baseline Study implemented by ICF International in Fiscal Year 2016. The research examines factors, in the context of resilience and mitigation of the negative effects of shocks and stresses on well-being, which can serve as the foundation for an evidence base for improving resilience programming in the *SHOUHARDO3*, *Nobo Jatra*, and SAPLING program areas.

The types of shocks experienced in the previous 12 months differed widely across the three program areas. For example, more than twice the number of households in the *SHOUHARDO3* experienced flashflood and deforestation compared to the other two program areas; conversely, more than twice the number of households in SAPLING versus either *SHOUHARDO3* or *Nobo Jatra* suffered water scarcity, landslide and flooding from excessive rainfall. Serious illness was the one consistent shock across all program areas. Overall, households reported experiencing an average of 2 shocks over the course of the previous 12 months. Finally, despite the variation of shocks across program areas, there was no difference in the level of severity.

At the time of the ICF Baseline Study household survey from April to June of 2015, well-being as measured by food security (i.e., hunger, dietary diversity, and food consumption) indicate that many households were recovering from any negative food security impacts of shocks experienced in the past year. The prevalence of severe to moderate hunger ranged between 6.8 and 7.2 percent (across program areas), household diets were relatively diversified, ranging from 6.5 to 7.3 on the household dietary diversity scale, and food consumption scores ranged from 55.5 to 63.4. However, utilization of negative food coping strategies, in particular, reducing food consumed, changing the types of foods consumed and spending less money on food, were more common than not across all program areas. Additionally, although the percent of households with a wasted child was 14.5 percent across the program areas, twice as were seen in *Nobo Jatra* compared to the other two program areas (21.0 percent vs 12.8 and 9.5).

While poverty appears to be a persistent problem across all program areas (31.0 percent), this is accounted for primarily by the nearly twice as many households in *SHOUHARDO3* (40.3 percent) living in poverty relative to those in *Nobo Jatra* (16.7 percent) and SAPLING (19.2 percent) program areas. Correspondingly, *SHOUHARDO3* households had the least amount of daily spending money (\$2.13USD) compared to either *Nobo Jatra* or SAPLING households (\$2.94USD and \$3.07USD, respectively).

Mirroring the pattern seen in food security, more *Nobo Jatra* households had recovered from shocks (34.8 percent) relative to their counterparts in *SHOUHARDO3* (24.5 percent) and SAPLING (23.7 percent) program areas.

Levels of household resilience capacity, namely absorptive and adaptive capacity, differ significantly across program areas. In particular, *Nobo Jatra* households have higher levels of absorptive capacity (20.6 out of 100) compared to the other two program areas (14.0 in SAPLING households and 16.0 in

SHOUHARDO3 households). Differences in absorptive capacity are mainly driven by differential rates of household savings and accumulation of household assets, which represent a proxy for wealth. *Nobo Jatra* households own more assets (4.5 versus 2.6 to 3.4) and are more likely to report household savings (28.8 percent vs. 19.0 22.9 percent) compared to other program areas.

Nobo Jatra households also have higher levels of adaptive capacity (53.2 out of 100) than SAPLING (36.0) and *SHOUHARDO3* households (42.9).

Education, wealth (assets), and livelihood diversity explain this differential across program areas. Nearly all *Nobo Jatra* households (93.2 percent) report a household adult with primary education or higher. In contrast, the percentages of *SHOUHARDO3* and SAPLING households with an educated adult are 77.1 percent and 71.1 percent, respectively. Livelihood diversity is highest in *Nobo Jatra* (3.0) compared to 2.6 and 2.3 in the other two program areas. As noted above, *Nobo Jatra* households, on average, have higher household assets than other program areas, helping to contribute to both higher absorptive and adaptive capacities.

Transformative capacity levels are low across all three program areas (6.8 out of 100). Average levels of transformative capacity of households range from 6.4 in *Nobo Jatra* to 7.6 in SAPLING. While there are no statistical differences, the variation in transformative capacity levels is accounted for primarily in access to agricultural extension services, where SAPLING households had the highest degree of access (14.2 percent) compared to 12.5 and 12.8 among *SHOUHARDO3* and SAPLING households.

KEY FINDINGS

Households with higher absorptive and/or adaptive capacity are less likely to be poor, are more likely to earn higher incomes, have diets that are more diverse, and are less likely to be hungry. This is true (controlling) for any level of shock. However, of the two resilience capacities, absorptive capacity has the greatest impact on reducing poverty, increasing incomes, improving dietary diversity, and decreasing household hunger.

Transformative capacity, as measured in this study, does not have as strong of an influence on improvements in well-being. In particular, transformative capacity is weakly, but positively associated with higher dietary diversity and increased likelihood of utilizing coping strategies. Contrary to expectations, households with higher levels of transformative capacity are less likely to recover from shock and experience higher levels of childhood wasting compared with households having lower levels of transformative capacity. The weak relationships between transformative capacity and outcomes is likely due to the lack of salient dimensions of transformative capacity that are captured in the data, such as quality of infrastructure and services and equitable distribution of services.

In the context of resilience capacity, there are several underlying components of resilience capacity that directly support improvements in poverty and hunger. Increases in household assets and bonding social capital, consistently and directly, are associated with better outcomes.

Increased adoption of improved agricultural practices and greater access to formal safety nets directly support reduced hunger; while greater access to remittances, access to financial resources, higher education levels and greater livelihood diversity directly support reduced poverty.

1. Introduction

1.1 Objectives

The objective of this research is to provide implementing partners, Food for Peace (FFP), The Food and Nutrition Technical Assistance (FANTA) Project, the Center for Resilience (C4R), and the United States Agency for International Development (USAID) with large insights into factors that strengthen household and community resilience in Bangladesh. In particular, the research examines factors that can serve as the foundation for an evidence base for improving resilience programming in the *SHOUHARDO3*, *Nobo Jatra*, and *SAPLING* program areas. In addition, the research aims to address the following two questions:

1. Do resilience capacities mitigate the negative effects of shocks for select well-being outcome indicators, including poverty, dietary diversity, hunger, and wasting among children?
2. What is the relationship between resilience capacities and adoption of coping strategies to recover from shocks?

1.2 Organization of the Report

The report is organized to provide both context and understanding of the projects in relation to how the resilience capacities and well-being indicators are measured and analyzed. To begin, Section 2 describes the methodology used to conduct this research. Section 3 provides a brief description of the three projects analyzed: *SHOUHARDO3*, *Nobo Jatra*, and *SAPLING*. Sections 4 and 5 describe the types of shocks households experienced in the past 12 months and the extent to which households recovered from these shocks. Section 6 provides baseline estimates for select well-being outcome indicators used in this study. These include: per capita daily expenditures, prevalence of poverty, weight/height z-score and percent wasted, Household Dietary Diversity Score (HDDS), Food Consumption Score (FCS), and moderate/severe hunger. Section 7 presents the findings for the absorptive, adaptive, and transformative capacity index scores across the three program areas, along with the breakdown of each capacity by the indicators that comprise each index. Section 8 demonstrates the predicted effects of each resilience capacity and its components on key well-being outcomes. Section 9 gives an overview of the report's findings.

2. Methodology

This section briefly outlines the methodology, in particular the multivariate analysis methods, employed to address the objectives of this research as described above.

2.1 Quantitative Analysis

Quantitative data collection took place in two phases from April 12 to June 5 2016 as part of a baseline study of the *SHOUHARDO3*, *Nobo Jatra*, and *SAPLING* development food assistant projects funded by USAID and FFP. The study, implemented by ICF International, utilized a population-based household survey to collect information needed to report project indicators, including those measuring resilience

capacities of households in the program areas. The original sample size of households that responded to the resilience module of the survey was 3,438 households overall, divided fairly equally (1,139 households in *SHOUHARDO3*; 1,165 in *Nobo Jatra*; 1,134 households in *SAPLING*) among the three program areas. For this study, the data were restricted to include only households that experienced shocks in the 12 months prior to the survey (N=2,776). The primary reason for this restriction was to maintain methodological consistency with other resilience studies where the timeframe is for shocks having occurred in “the past 12 months”. The survey for this study asked about shocks in the last five years, which is quite a stretch for respondents to accurately recall details about, unless they were extremely salient shocks. This restriction is meant to minimize such recall bias. For further details concerning the baseline study sample design, see the ICF Baseline Study Draft Report (ICF 2016).

Data analysis

The quantitative data analysis was conducted with Stata SE version 13.1. Results are initially presented descriptively (e.g., means and percentages of households disaggregated by program area) in Sections 4, 5, and 6) of the main body of the report. First, household exposure to shock (Section 4) and utilization of coping strategies to respond to shock (Section 5) are disaggregated by program area to highlight differences in program area geographies to potentially help explain differential impacts resulting from the most salient shock in each region. Next, key well-being outcomes (Section 6) and resilience capacities (Section 7) are disaggregated by program area.

Results from multivariate analyses are summarized in the form of figures and tables in Section 8 are discussed in more detail below. Both descriptive and multivariate results incorporate sample weights and techniques necessary (i.e., complex sample corrected standard errors) to account for the clustering and stratification used as part of the sample design.

Resilience capacity indexes are generated using (exploratory) factor analysis methods and are consistent with the methods employed by ICF as part of their baseline analysis of the *SHOUHARDO3*, *Nobo Jatra*, and *SAPLING* projects (ICF 2016). Calculations for the resilience capacities and resilience capacity indexes are described in detail in Annex A.

Multivariate Analysis

Following the descriptive analysis, key results from multivariate regression analysis are presented in tabular and graphic form. Comprehensive results generated as part of the multivariate analysis are available in Annex B. The multivariate analysis utilizes two estimators depending on the particular specification and distribution of the dependent variable (i.e., outcomes). Dichotomous dependent variables are estimated with a probit estimator and continuous dependent variables are estimated using an ordinary least squares (OLS) estimator. Estimators used are noted in the respective regression output tables in Annex B.

In general, the multivariate specifications treat resilience capacity, in the face of shocks and stressors, as a key determinant of well-being outcomes. Other determinants, used as controls, include shock exposure, structural household characteristics, and community characteristics.

The multivariate results are presented in Section 8. Section 8.1 summarizes results exploring the direct relationship between resilience capacity indexes and well-being outcomes. Subsequently, in Section 8.2, the relationships between the underlying components of the resilience capacity indexes and well-being outcomes are presented. A detailed description of all multivariate specifications used in this study is available in Annex C.

Predicted values of outcomes

In Section 8 of this report, the relationships between resilience capacities and outcomes are presented in graphical form as predicted values or probabilities of outcomes. The predicted values of the outcomes are computed using the estimated results from the respective regression specifications at varying values of resilience capacities (i.e., 0 to 1 in 0.05 increments; at the 25th percentile of a respective resilience capacity compared to at the 75th percentile of the resilience capacity; 0 and 1 if the resilience capacity is a binary variable) while holding all values of other explanatory variables constant at their means.

Annex B: Table 32 is a summary of changes in predicted values and/or probabilities of all outcomes resulting from varying all resilience capacities (indexes and components) between the 25th percentile of the resilience capacity to the 75th percentile of the resilience capacity (or in the case of capacities measured as binary variables, 0 to 1). This table gives a depiction of the strength, or magnitude, of the relationship between resilience capacities and outcomes reported in similar units.¹ (See also additional descriptives in Annex D, which describes a move from the 25th to 75th percentiles in actual values for each resilience capacity.)

2.2 Limitations

Sample: While not necessarily a limitation, it should be noted that for this report, the original sample used for the ICF International Baseline report is restricted to households who experienced a shock within the last 12 months. This decision was made in order to be consistent with other country analyses and resilience studies that commonly use the last 12 months as the timeframe.

Cross-sectional analysis: Resilience is operationalized as the mitigation of negative effects of shocks and stresses on well-being outcomes. This relationship is best understood in the context of changes in well-being outcomes over time. However, this study utilizes data from just one period, or cross-section of time, which is a limitation.

Shock severity: For this study, shock severity was used as a controlling factor in the multivariate analysis looking at the relationships between shock exposure, resilience capacity, and well-being outcomes. Specifications to interact shock exposure with resilience capacity (indexes) were tested and in no cases were the results statistically significant with the correct sign (i.e. direction of influence of effect). Results are not presented in the body of the paper, but are available in Annex B: Table 21 to Table 27.

¹ It was debated whether to report elasticities or changes in predicted values. In the end, predicted values were chosen given the difficulty of interpreting elasticities of effects on binary or ordinal dependent variables.

Coping strategies: While the questions about coping strategies are associated with individual types of shocks, the disparity of shocks experienced across the three program areas does not warrant an analysis at the individual shock level as the sample sizes would be too small to provide accurate estimates. Therefore, the data were analyzed as coping strategies utilized in response to ANY shock experienced in the last 12 months prior to the survey.

Livelihood diversity: The livelihood diversity measure used in this study is not ideal, in that, it only counts the number of livelihoods employed by members of a given household. A better livelihood diversity measure would capture the number of different livelihoods in which a household participates across different livelihood risk profiles (e.g. climate risk, macroeconomic risk, etc.).

Absorptive capacity: Linking social capital was not captured in this study and as such is not part of the absorptive capacity index. Other dimensions, listed below, may be incomplete or defined in ways that may not measure them accurately using what data was available for the analysis.

- **Access to informal safety nets:** The definition for access to informal safety nets for this study diverges from the way it is typically defined, which is as a count of community organizations that could *potentially* provide safety nets. For this study, it was based instead on whether households *actually* borrowed money or purchase on credit from friends/family/neighbors under conditions of no interest or reciprocity. Therefore, households that did not borrow are assumed to not have access, but it may simply be the case that they did not want or need to.
- **Bonding social capital:** In this study, bonding social capital is based on how many friends provide advice, lend money, lend food, and provide paid work, in addition to the number of times respondent has been invited to social gathering in the last 12 months. It is important to keep in mind that the index is most commonly constructed not by the count of friends a household could rely on, but whether the household could rely on others in their community, and if the household would be able to extend help to others in their community.

Adaptive capacity: Three components of adaptive capacity, including bridging social capital, linking social capital and exposure to information were not captured by the household survey and as such are not part of the adaptive capacity index.

- **Access to financial services:** Values for this indicator do not accurately depict “access” as it is typically measured to feed into adaptive capacity. For this study, respondents were asked “Did you take any agricultural credit, in cash or in kind, in the past 12 months from any of the following institutions?” While the response option of “Did not take any agricultural credit” was available, this does not provide information for whether it was because there are no institutions available (“access”) or for any some other reason (e.g., did not need it). In other words, “access”, as it is measured here, is contingent on households taking credit. In most studies, access to financial services is measured by the presence of an institution that provides savings and/or credit support where a score of zero indicates that the household has no access to any such institution in its community, and a score of two indicates that institutions exist that provide both savings and credit services, regardless of whether credit was taken.

Transformative capacity: Several important dimensions of transformative capacity were not adequately captured by the household survey and are not included as part of the transformative capacity index. These dimension include: bridging social capital, linking social capital, access to markets, access to basic services, access to infrastructure, and participation in local governance. Only two dimensions were captured in the baseline survey, access to formal safety nets and access to agricultural services. However, access to formal safety nets is measured in such a way that, again, is contingent on households receiving support (or taking credit as with access to financial services for the adaptive capacity index); it does not accurately assess whether households could access an institution if they needed or wanted to as it restricts access to households who relied on such services.

Nutrition: Results exploring relationships between childhood weight-to-height, shock exposure, and resilience were inconclusive. Neither shock exposure nor key structural characteristics such as access to clean water and access to improved sanitation are related to wasting for children (i.e. child under 5, weight-to-height) in the study sample. Results are presented in Table 16 in Annex B.

3. Description of Projects

In fiscal year 2015, FFP awarded funding for three development food assistance projects in Bangladesh: (1) the Strengthening Household Ability to Respond to Development Opportunities 3 (*SHOUHARDO3*) project, implemented by Cooperative for Assistance and Relief Everywhere (CARE); (2) the *Nobo Jatra* Project, implemented by World Vision, Inc.; and (3) the Sustainable Agriculture and Production Linked to Improved Nutrition Status, Resilience, and Gender Equity (*SAPLING*) Project, implemented by Helen Keller International (HKI).

The goal of *SHOUHARDO3* is to build a more resilient population in targeted areas of the Char and Haor regions of Bangladesh by precipitating or causing three primary changes: empowerment, governance, and engagement.

Nobo Jatra's project targets households in the Southern Coastal areas of Khulna and Satkhira districts. The project aims to address the underlying causes of chronic food insecurity by improving knowledge, capacity, and links to food production and income generation and facilitate improvements in household assets and savings.

SAPLING's project goal is to build resilience among vulnerable populations to the stressors and shocks that impede local food security in the Chittagong Hill Tracts located in the southeast region of Bangladesh by using a multi-sectoral approach that includes increased homestead production, consumption of diverse, nutritious foods, and improved capacity to mitigate and adapt to disasters.

4. Shock exposure

Measuring the exposure of households to shocks is important for understanding resilience because resilience is essentially about being able to prepare for, withstand and recover from shocks and stressors. Shocks can be of two types. The first is large covariate shocks (i.e., they affect large numbers of people or broad geographic regions), such as catastrophic weather events, geologic events, and crop pests. The second is idiosyncratic shocks, more localized events that affect certain individuals or

households (i.e., illness, death of household members, conflict, etc.). Detailed knowledge of these types of shocks and stressors, in addition to knowledge of how households and communities perceive and respond to them, is required for effective resilience programming and for understanding whether projects designed to enhance resilience are actually doing so.

It should be noted here that only households who experienced a shock AND rated it as one of the top five most severe shocks are kept for analysis throughout this report. This is due to the structure of the survey where only households that experienced at least one shock in the past 12 months were administered the resilience module, which is necessary information for the analyses. As such, households that did not experience a shock during the 12-month timeframe were censored from the dataset.

This section presents baseline values on the types of, and degree of exposure to, shocks experienced by households in the *SHOUHARDO3*, *Nobo Jatra*, and *SAPLING* program areas in the year prior to the baseline survey.

4.1 Types of shocks experienced in the previous year

Table 1 shows the percent of households that experienced various shocks over the year prior to the baseline survey – including climate-related shocks, economic shocks, and conflict-related shocks.

Table 1: Percent of households experiencing various shocks in the past 12 months

Table 1: Percent of households experiencing various shocks in the past 12 months				
Type of shock	All	Program area		
		SHOUHARDO3	Nobo Jatra	SAPLING
		(% HHs)		
Climate shocks				
Flashflood	34.9	51.2 ^a	9.2 ^a	16.0 ^a
Soil erosion	20.5	20.4 ^a	23.8 ^b	5.9 ^{ab}
Pest attack	16.4	14.1 ^a	19.0	23.7 ^a
Loss of small livestock	14.4	14.1	14.5	16.4
Deforestation	14.0	19.9 ^a	6.4 ^a	0.2 ^a
Water logging	10.2	13.3 ^a	6.6 ^a	0.1 ^a
Drought	8.6	9.3 ^a	8.7 ^b	1.7 ^{ab}
Flooding from excessive rainfall	7.0	5.7 ^a	7.3 ^b	16.2 ^{ab}
Water scarcity	6.2	7.2 ^a	1.5 ^a	19.6 ^a
Cyclone	2.4	2.8 ^a	0.1 ^a	7.5 ^a
Landslide	2.3	1.3 ^a	0.5 ^b	19.7 ^{ab}
Wild animal attack	1.1	0.0 ^a	1.7 ^a	7.8 ^a
Economic shocks				
Serious illness	22.9	19.3 ^a	29.6 ^{ab}	22.4 ^b
Increasing indebtedness	15.2	14.9 ^a	17.3 ^b	7.9 ^{ab}
Accident	7.9	7.2	9.2	7.3
Loss of assets	5.7	4.5 ^a	8.1 ^{ab}	4.4 ^b
Low market prices	4.4	4.2	4.3	6.0
High food prices	3.3	1.8 ^a	6.2 ^a	2.8
High input prices	3.3	3.0	4.3	1.2
Pregnancy	2.3	1.9	3.2 ^a	1.3 ^a
Death of HH member (not main earner)	2.2	2.5	1.9	1.5

Dowry	2.1	2.2 ^a	2.2 ^b	0.0 ^{ab}
Death/disability of main earner	1.5	1.5	1.6	1.3
Family split	1.2	1.3	1.3 ^a	0.5 ^a
Poor access to services	0.9	0.5 ^a	0.4 ^b	6.6 ^{ab}
Accidental fire	0.2	0.0 ^a	0.0 ^b	3.1 ^{ab}
Loss of job	0.0	0.0 ^a	0.4 ^a	0.2
Conflict shocks				
Tension/violence between ethnic group	7.7	0.0 ^a	23.3 ^a	0.8 ^a
Tax extortion	2.6	2.1 ^a	4.1 ^b	0.1 ^{ab}
Land grabbing	2.5	0.9 ^{ab}	5.4 ^b	2.3 ^a
Insecurity	0.0	0.0 ^a	1.2 ^b	0.0 ^b
n	2,776	972	934	870

^{a,b} Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

The distribution of shocks varies quite widely across the program areas. For instance, while flashflood is the most commonly reported adverse event across all households (34.9 percent), this is accounted for primarily by the markedly higher incidence among *SHOUHARDO3* households (51.2 percent) compared to those in either the *Nobo Jatra* (9.2 percent) or SAPLING (16.0 percent) program areas. Soil erosion affected significantly fewer households in SAPLING (5.9 percent) compared to those in either *SHOUHARDO3* (20.4 percent) or *Nobo Jatra* (23.8 percent). Similarly, fewer SAPLING households indicated increasing indebtedness (7.9 percent) or drought (1.7 percent) as major stressors compared to both *SHOUHARDO3* (indebtedness = 14.9 percent; drought = 9.3 percent) and *Nobo Jatra* (indebtedness = 17.3 percent; drought = 8.7 percent) households. It is also worth noting that deforestation and water logging are experienced considerably more often in *SHOUHARDO3* households than SAPLING and *Nobo Jatra* Program area households.

While there were statistical differences between program areas, serious illness was the most evenly distributed adverse event. One in five households (22.9 percent) experienced serious illness, and this was more prevalent among *Nobo Jatra* households (29.6 percent) than for either SAPLING (22.4 percent) or *SHOUHARDO3* (19.3 percent) households.

Finally, nearly one-quarter (23.3 percent) of the households in the *Nobo Jatra* program area indicated tension between ethnic groups as one of the top five shocks or stressors they experienced in the previous 12 months.

Table 2 shows that, on average, households in the combined program areas experienced between two and three (2.5) types of shocks in the 12 months prior to the survey. Those in the SAPLING program area reported significantly fewer than households in *Nobo Jatra* (2.3 versus 2.7, respectively).

Table 2: Average number of shocks experienced in past 12 months

	Program area			
	All	<i>SHOUHARDO3</i>	<i>Nobo Jatra</i>	SAPLING
Mean number of shocks experienced by HHs (range 1-12) ¹	2.2	2.3	2.2	2.1
n	2,776	972	934	870

^{a,b} Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

¹From a list of 31 possible shocks, respondents were allowed to indicate a maximum number of 12 they experienced AND they had to have been ranked as one of the top five most severe shocks.

4.2 Shock exposure index

Table 3 also reports a summary “shock exposure” index that will be used in additional analyses later in this report. As part of the shock module in the household survey, respondents were asked “Last time you faced this EVENT tell us how ‘severe’ this was/is for your family”. The five possible answers ranged from 0=“Eventually it brought some positive outcomes” to 4=“Very bad”. The shock exposure index is a sum of severity ratings across the total number of shocks a household was exposed to, yielding a total possible score ranging from 0 to 20. Overall, the index of shock exposure is 7.8 and does not differ across the program areas.

Table 3: Shock exposure index

	Program area			
	All	SHOUHARDO3	Nobo Jatra	SAPLING
Shock exposure index (mean; max 20)	7.8	7.9	7.6	7.2
n	2,776	972	934	870

Takeaways 1: Shock exposure

The average number of shocks experienced in the past 12 months was two; each program area suffered from relatively the same number, but differed by type of shock.

Flashfloods, serious illness, increasing indebtedness, pest attack, and loss of small livestock were the five most prevalent shocks among program area households. However, there was no consistent pattern across the three program areas, reflecting the idiosyncratic nature of each geographic region.

The severity of shock measure is a combination of the number of shocks experienced weighted by how adversely a household was impacted. While the type of shocks differed across the program areas, the perceived severity was relatively consistent.

5. Coping strategies to recover from shocks

As seen in Section 4, the three program areas are subject to a variety of shocks and it is important to understand the coping strategies they employ to manage them.

Table 4 presents information on coping strategies used by households in response to stressful events in the past year. The strategies are grouped into six types: reducing the level of food consumed, changing

the type of food consumed, reducing current expenditures, getting more money, selling assets, and migrating.

Borrowing money (most commonly from friends/relatives), reducing expenditures (particularly, household expenses) and changing the types of foods consumed (most notably, meat) were the most common behaviors (71.6 percent, 70.9 percent and 67.6 percent, respectively). Among the roughly one-quarter of households that sold assets (23.0 percent), most were likely to sell livestock. Engaging with these coping strategies were more common among households in *SHOUHARDO3* than in the other two program areas. The primary explanation for greater reduction of food and expenditures in *SHOUHARDO3* is that flashflood was the most common shock experienced, and in comparison to all other shocks, had the highest-reported incidence.

A positive contrast to the large percent of households resorting to reducing food consumption and selling off livestock, an important productive asset, is that less than 10 percent of the program area households or household members migrated. Of those that did, twice as many *SHOUHARDO3* households migrated compared to those in the SAPLING program area (8.6 percent and 3.9 percent, respectively).

Table 4: Coping strategies used to recover from ANY shock in the past 12 months

Coping Strategies	All	Program area		
		SHOUHARDO3	Nobo Jatra	SAPLING
		(% HHs)		
Reduce food consumption	53.5	58.6 ^a	47.8 ^a	37.0 ^a
fewer meals per day ¹	65.7	65.4	65.5	71.3
smaller portion per meal ¹	54.4	55.1	53.2	52.9
Changed type of food consumed	67.6	71.6 ^a	63.4 ^a	52.7 ^a
increase foraging of wild food ²	7.7	7.3 ^a	7.0 ^{ab}	17.6 ^b
reduce meat ²	70.5	69.5 ^a	71.0 ^{ab}	79.9 ^b
reduce starches/tubers ²	12.2	11.4	14.8 ^a	6.5 ^a
reduce pulses ²	12.1	12.9 ^a	11.4 ^b	7.0 ^{ab}
reduce grain ²	42.8	47.2 ^a	38.0	19.2 ^a
reduce legumes ²	2.0	2.5 ^a	1.3	0.2 ^a
reduce fruits ²	15.3	13.6 ^a	20.0 ^a	7.6 ^a
reduce eggs/dairy ²	42.8	44.9	38.4	42.6
reduce fish from market ²	49.7	50.9 ^a	45.3 ^{ab}	60.7 ^b
Reduced expenditures	70.9	75.2 ^a	65.1	61.4 ^a
reduce farm expenses ³	18.6	17.5	20.6	20
reduce leisure expenses ³	31.8	33.3	28.2	33.3
reduce food expenses ³	68.2	70.6	64.4	63.1
reduce housing expenses ³	75.8	75.1	77.4	75.3
reduce health expenses ³	14.1	15.1 ^a	13.4 ^b	7.0 ^{ab}
stop paying school fees ³	4.2	3.7	5.3	2.6
find cheaper housing ³	1.0	1.1	0.6	0.8
Borrow money/purchase on credit	71.6	75.4 ^a	65.5 ^a	49.5 ^a
friends/relatives ⁴	71.0	71.5	69.9	70.5
money lender ⁴	27.3	30.5 ^a	22.0	20.6 ^a
local shop owner ⁴	14.1	10.7 ^a	20.7 ^a	14.7
savings group ⁴	2.8	2.8	2.7	3.7
cooperative ⁴	5.1	3.6 ^a	8.3 ^{ab}	3.1 ^b
NGO/microcredit ⁴	32.2	28.0 ^a	41.3 ^{ab}	27.0 ^b
Sell assets	23.0	23.7	22.1	20.6
jewelry ⁵	9.0	5.9 ^{ab}	14.0 ^b	13.8 ^a
household items ⁵	14.2	12.3 ^a	16.9 ^a	19.6 ^a
livestock ⁵	68.3	68.4	67.4	72.6
farming tools ⁵	1.7	2.3	0.5	1.5
land ⁵	18.9	20.6 ^a	17.6 ^b	9.1 ^{ab}
Migration	7.6	8.6 ^a	6.4	3.9 ^a
	n 2,776	972	934	870

^{a,b}Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

¹Of those households that reported reducing level of food consumption.

²Of those households that reported changing type of food consumed.

³Of those households that reported reducing household expenses.

⁴Of those households that reported borrowing money or purchasing on credit.

⁵Of those households that reported selling assets.

Takeaways 2: Coping strategies

Between half to three-quarter of the households in the three program areas reduced or changed their patterns of food consumption, reduced expenditures and/or borrowed money as a means of coping with shock in the previous 12 months. Of those households that utilized these coping strategies, a majority consumed less meat, spent less on housing expenditures, and relied on friends/relatives for money.

Generally speaking, more *SHOUHARDO3* households utilized these coping strategies compared to those in the *Nobo Jatra* or *SAPLING* program areas.

Roughly one in four households (23.0 percent) across all three program areas sold assets as a coping strategy, the most common being to sell livestock (68.3 percent).

Less than 10 percent of households in the program areas reported migration as a means of recovering from shock.

6. Household well-being outcomes

The values in Table 5 show the baseline estimates for selected well-being outcome indicators used as part of this study, disaggregated by program area. Daily expenditures are significantly higher in *Nobo Jatra* and *SAPLING* program areas (\$2.94 and \$3.07, respectively) compared to what *SHOUHARDO3* households report spending (\$2.13). Correspondingly, not only do more than twice as many *SHOUHARDO3* households live on less than \$1.90 compared to those in *Nobo Jatra* and *SAPLING*, but poor households are on average also twice as far below the \$1.90 threshold (mean depth of poverty). Given that the *SHOUHARDO3* program area is operating among some of the poorest settlements in the country² and more than half of the households experienced flashfloods (Table 1), these disparities in income and poverty levels are not surprising.

² ICF Macro. 2016. Baseline Study of FY 2015 Food for Peace Development Food Assistance Projects in Bangladesh. Report prepared for USAID. Draft.

Table 5: Outcome indicators, all program areas

Outcome indicator	All	<i>n</i>	<i>SHOUHARDO</i> 3	<i>n</i>	<i>Nobo</i> <i>Jatra</i>	<i>n</i>	SAPLING	<i>n</i>
Income proxy:								
Per capita daily expenditures (mean; US\$)	\$2.47	2,776	\$2.13 ^{ab}	972	\$2.94 ^a	934	\$3.07 ^b	870
Prevalence of poverty (% HH, <US\$1.90)	31.0	2,776	40.3 ^{ab}	972	16.7 ^a	934	19.2 ^b	870
Mean depth of poverty (US\$1.90 income threshold)	4.3	2,776	5.6 ^{ab}	972	2.2 ^a	934	2.7 ^b	870
Nutrition:								
% HH with a wasted child (whz < 2 SD)	14.5	895	12.8	319	21.0 ^a	273	9.5 ^a	303
Weight/height (mean Z-score, children under 5)	-0.91	895	-0.88	319	-1.05 ^a	273	-0.78 ^a	303
Food security:								
HDDS (past 24 hrs) (mean; range 0-12)	6.9	2,645	6.8 ^a	937	7.3 ^{ab}	887	6.5 ^b	821
Food Consumption Score (FCS) (past 7 days) (mean; max 112)	59.2	2,771	57.3 ^a	972	63.4 ^{ab}	932	55.5 ^b	867
% HH moderate or severe hunger (past month)	6.9	2,771	6.8	972	7.2	932	6.9	867
Recovery from shock (% HH)	25.0	2,776	24.5 ^a	972	34.8 ^{ab}	934	23.7 ^b	870

^{a,b} Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Statistically significant differences exist between program areas for the remaining food security indicators, with the exception of moderate to severe hunger. The Household Dietary Diversity Score (HDDS) is used as a proxy measure of household food access, defined as the ability to acquire a sufficient quality and quantity of food to meet all household members' nutritional requirements for productive lives.³ (It is important to note that HDDS does not indicate nutrition levels.) HDDS is computed by summing the number of different food categories reported eaten by the household in the 24 hours prior to the interview. The HDDS was measured as recommended by FANTA, using the following 12 food groups: cereals, tubers, vegetables, fruits, meat, eggs, fish, legumes, dairy, oils, sugar, and other.⁴ A higher HDDS represents a more diverse diet, which is highly correlated with a household's income level and access to food.⁵ The mean HDDS values in this sample indicate moderate to high dietary diversity in

³ FANTA III Food and Nutrition Technical Assistance Web site. <http://www.fantaproject.org/monitoring-and-evaluation/household-dietary-diversity-score> Accessed February 1, 2017.

⁴ Other may include such items as condiments, spices, coffee or tea

⁵ Swindale, Anne, and Paula Bilinsky. *Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide (v.2)*. Washington, D.C.: Food and Nutrition Technical Assistance Project, Academy for Educational Development, 2006.

all program areas, with households consuming 6 to 7 food groups per day, on average. *Nobo Jatra* households enjoy the highest dietary diversity (7.3), and while statistically greater than either *SHOUHARDO3* (6.8) or *SAPLING* (6.5), the differences are quite small.

The Food Consumption Score (FCS) is an indicator of food security that combines the elements of diversity and quality of different types of food. It is a weighted score calculated using the frequency of consumption of different food groups consumed by a household in the 7 days before the survey.⁶ The same pattern is seen with the FCS as with the HDDS; although the estimates are statistically significantly different, the magnitudes of those differences are marginal. Households in *Nobo Jatra* enjoy a greater diversity of foods consumed (63.4) than *SHOUHARDO3* (57.3) or *SAPLING* (55.5).

Prevalence of child wasting (children under 5 less than 2 standard deviations below an international standard weight-to-height mean by age category) is 14.5 percent. The percentage of households with at least one wasted child is highest in *Nobo Jatra* (21.0 percent), and significantly greater than the rate among households in *SAPLING* (9.5 percent).

Finally, the proportion of households recovering from shock (defined as recovering to the same level or better from all shocks experienced) is roughly one in four (25.0 percent) for the whole sample. Households in *Nobo Jatra* had the highest recovery outcome (34.8 percent) compared to those in both *SAPLING* and *SHOUHARDO3* (23.7 percent and 24.5 percent, respectively).

Takeaways 3: Well-being outcomes

SHOUHARDO3 households are twice as likely to be poor and have significantly less money to spend compared to households in the other two program areas. However, they have relatively the same levels of dietary diversity and recovery as their counterparts in *SAPLING*.

Overall, rates of household hunger are low (6.9 percent) and there are no significant differences across program areas.

Curiously, there is an unexpected pattern of outcomes among the *Nobo Jatra* households; even though they have the lowest rates of poverty and highest degree of dietary diversity and recovery among the three program areas, child wasting is twice as high.

7. Household resilience capacities

This section presents and analyzes the absorptive, adaptive, and transformative resilience capacity index scores for *SHOUHARDO3*, *Nobo Jatra*, and *SAPLING* program areas, along with the indicators that comprise each index. Annex A details how each indicator is computed, and cross-references survey

⁶

http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp197216.pdf?_ga=1.114681031.1126717141.1489438
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questions used to gather data for the indicator. Note that some indicators are components of more than one index (e.g., asset score is a component of both the absorptive capacity index and the adaptive capacity index). All resilience capacity components included in this section are presented in their original scales to facilitate understanding of the disparate factors, and their differing measurement, contributing to resilience capacities.

7.1 Absorptive capacity

Table 6 shows the overall absorptive capacity index values for the three program areas. The analysis indicates that while *Nobo Jatra* households have higher absorptive capacity relative to both *SHOUHARDO3* and *SAPLING*, all program areas have relatively low absorptive capacity (with index scores of 16.0, 20.6, and 14.0, respectively, out of a possible 100). More *Nobo Jatra* than *SHOUHARDO3* households reported saving cash in the past 12 months (28.8 percent versus 19.0 percent, respectively). *Nobo Jatra* households have an average of one additional asset compared to *SHOUHARDO3* (4.5 and 3.4, respectively), and twice as many as *SAPLING* households (2.6 assets). However, asset scores for all program areas are strikingly low; out of 18 possible types of durable assets inquired about,⁷ all program area households owned just three to four types. The bonding social capital score is based on the total number of friends the household can rely on for a) advice when having to take crucial decisions, b) lending money, c) lending food, d) providing paid work, and e) the number of times the household has been invited to a social gathering. According to the survey data, it appears that *Nobo Jatra* households enjoy the greatest degree of bonding social capital (13.3), which, while statistically different from both *SHOUHARDO3* (11.5) and *SAPLING* (10.4), the absolute values of the differences across the program areas are quite small in relation to the overall low value in the sample (12.0 out of a maximum possible score of 170).

Table 6: Absorptive capacity index and components, all program areas

Indicator	Program area			
	All	SHOUHARDO3	Nobo Jatra	SAPLING
Absorptive capacity index (mean; range 0-100)	17.4	16.0 ^a	20.6 ^a	14.0 ^a
<i>Index components:</i>				
% HH with any cash savings	22.5	19.0 ^a	28.8 ^a	22.9
Asset score (mean; max 18)	3.7	3.4 ^a	4.5 ^a	2.6 ^a
Bonding social capital score (mean; max 170)	12.0	11.5 ^a	13.3 ^{ab}	10.4 ^b
% HH receiving remittances ⁸	1.8	2.2	1.1	1.9
Shock preparedness and mitigation score (mean; max 10)	0.2	0.2 ^{ab}	0.3 ^a	0.3 ^b
Access to informal safety nets (mean; max 5)	0.4	0.4 ^a	0.3 ^b	0.2 ^{ab}
<i>n</i>	2,768	971	929	868

^{a,b} Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Access to informal safety nets reflects whether households borrowed money from friends/relatives without interest or terms of reciprocity after experiencing a shock. According to the survey data, this is not as common as hardly any household was able to borrow money under such conditions (mean overall score is 0.4 of a possible 5). Regardless of statistically significant differences, the magnitudes of these differences across program areas are not large. The shock preparedness and mitigation score is a sum of positive responses across the five shocks as to whether the household made plans related to a) farming activities and/or b) non-farming activities in anticipation of the shock experienced. The overall score is very low (0.2 out of a possible 10), and while significant differences were found between *SHOUHARDO3* and *SAPLING*, the magnitude is so low as to be negligible.

⁸ It should be noted that remittances was recalculated so that only households that indicated receiving remittances from within and outside Bangladesh are considered. The Baseline Report used "Purchases (cash or barter)" rather than "Remittances from outside BD" and is highly inflated. The values reported here are correct.

Takeaway 4: Absorptive capacity

Average values of the absorptive capacity index range from roughly 15.0 (14.0 in *SAPLING* households and 16.0 to 20.6 in *SHOUHARDO3* households) to 20.6 in *Nobo Jatra* households.

What is driving differences?

Differences in absorptive capacity across program areas are driven by household access to saving cash in formal institutions and household asset holdings. Nearly one-third of *Nobo Jatra* households (28.8 percent) report saving cash whereas rates of saving for *SHOUHARDO3* households are lower (19.0 percent). *Nobo Jatra* households own an average of 4.5 assets out of a possible 18. *SHOUHARDO3* households own, on average, 1.1 fewer assets (3.4 assets) and *SAPLING* households own the least with an average of 2.6 assets.

What is working?

Household reliance on remittances from within and outside Bangladesh is very low. Less than 2 percent of households receive remittances and 7.6 percent migrate as a coping strategy across the entire sample. There are significant differences between projects for remittances; however, it is interesting to note that *SHOUHARDO3* has the highest percent of households receiving remittances and migrating, largely due to seasonal migration patterns in the area (IFC Macro, 2016, pg. 4). This data may point to the idea that households do not rely on migration when faced with shocks and stressors and are more willing to utilize other coping strategies that are less extreme and/or negative.

What could be improved?

Asset ownership as measured by the number of consumer durables owned (out of 18) and bonding social capital (with a max score of 170) are low overall and across the three program areas, with *SAPLING* having the lowest scores. Likewise, almost none of the households in the sample have informal safety net support, and/or access to preparedness and mitigation programs to counteract the impact of shocks. This may reflect a structural deficiency in community and social service infrastructure that supports shock preparedness.

7.2 Adaptive capacity

Values for the adaptive capacity index and its component indicators are shown in Table 7. Out of a possible score of 100, households in *Nobo Jatra* scored significantly higher on the adaptive capacity index (53.2), followed by *SHOUHARDO3* (42.9) and *SAPLING* (36.0). One of the main drivers of the differences in adaptive capacity is differing levels of human capacity. Overall, the percent of households with at least one adult with primary or higher education is high (82.0 percent), but this is largely influenced by the fact that nearly all *Nobo Jatra* households (93.2 percent) include members with educated adults. Even though this characteristic is significantly lower in *SHOUHARDO3* and *SAPLING* households compared to *Nobo Jatra* (and between *SHOUHARDO3* and *SAPLING*), it is, nevertheless, quite high in absolute terms in both *SHOUHARDO3* and *SAPLING* (77.1 percent, and 71.1 percent,

respectively). Households were engaged in two to three (2.7) livelihoods out of a possible 15 inquired about in the survey; the differences between *SHOUHARDO3*, *Nobo Jatra* and SAPLING are significant, but relatively small (2.6, 3.0, and 2.3 livelihood types on average, respectively) (for a complete listing and percent of households engaged in each type of livelihood, please refer to Annex B: Table 9).

For this study, respondents were asked if they took out credit (in cash or in-kind) in the last 12 months from various institutions in their community as a measure of access to financial resources. On average, nearly forty percent (38.3 percent) of program area households were able to access financial services, with those in *SHOUHARDO3* having the greatest access (41.0 percent) and those in SAPLING the lowest access (29.0 percent). As discussed in the previous section, asset scores are similar and very low in all three areas.

Table 7: Adaptive capacity index and components, all program areas

Indicator	Program area			
	All	<i>SHOUHARDO3</i>	<i>Nobo Jatra</i>	SAPLING
Adaptive capacity index (mean; range 0-100)	45.8	42.9 ^a	53.2 ^a	36.0 ^a
% HHs w/ one or more adults in HH w/primary education or higher	82.0	77.1 ^a	93.2 ^a	71.1 ^a
% HHs adopted improved (project promoted) agriculture practice	66.4	65.5 ^a	65.7 ^b	76.9 ^{ab}
Livelihood diversity score (mean; range 0-15)	2.7	2.6 ^a	3.0 ^a	2.3 ^a
% HHs accessing financial resources	38.3	41.0 ^a	35.5	29.0 ^a
Asset score (mean; max 18)	3.7	3.4 ^a	4.5 ^a	2.6 ^a
	<i>n</i> 2,776	972	934	870

^{a,b}Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

More than two-thirds of project households adopted at least three improved agricultural practices (66.4 percent), but this was significantly greater among SAPLING households than in either of the other two program areas (76.9 percent in SAPLING versus 65.7 percent and 65.5 percent in *SHOUHARDO3* and *Nobo Jatra*, respectively).

Takeaway 5: Adaptive capacity

Average values of the adaptive capacity index range from a low of 36.0 in SAPLING households to 53.2 in *Nobo Jatra* households. *SHOUHARDO3* households are in between with an average score of 42.9.

What is driving differences?

Differences in adaptive capacity can be explained by disparities in education, livelihood diversity, and asset levels. Nearly all of *Nobo Jatra* (93.2 percent) households have at least one adult with primary education or higher, while only 71.1 percent of SAPLING households have at least one adult with similar levels of education, albeit all are statistically significant. These higher education levels may be reflected in the higher assets levels observed for *Nobo Jatra* households and lower levels observed in SAPLING households, as discussed above in the absorptive capacity section. Higher asset holdings may also be associated with more sources of income; *Nobo Jatra* households report an average of three (3) livelihoods as compared to 2.3 in SAPLING households.

What is working?

More than 80 percent of the households in this sample have an adult with a primary or higher education, reflecting the country's gains over the past two decades to increase access to education and primary school enrollment. Additionally, over 65 percent of households have adopted improved agricultural practices for crop production, livestock production, natural resource management, or storage methods; however, significantly fewer households have adopted improved practices in *SHOUHARDO3* and *Nobo Jatra* in comparison to SAPLING. This is likely because the households in the *SHOUHARDO3* and *Nobo Jatra* program areas have a more diverse source of livelihoods than the households in the SAPLING program area, and thus may be less dependent on agriculture.

What could be improved?

On average, households across program areas are engaged in 2-3 livelihood activities. Most households rely on agriculture. Improving upon diversification into other livelihood categories can serve to protect households from future shocks and stressors especially in times when certain livelihoods are threatened.

7.3 Transformative capacity

The values for the transformative capacity index and its component indicators are shown in Table 8. The average index scores are very low for all three of the program areas (average of 6.8 out of possible 100) and the two elements of transformative capacity are similar across program areas. Just over ten percent of all households (12.8 percent) received at least one of the 10 agricultural extension services offered by the Government of Bangladesh. The other variable, access to formal safety nets, indicates that the

majority of households did not receive support from government and/or NGOs as reflected in the average score of 0.08.

Table 8: Transformative capacity index and components, all program areas

Indicator	Program area			
	All	SHOUHARDO3	Nobo Jatra	SAPLING
Transformative capacity index (mean; range 0-100)	6.8	6.9	6.4	7.6
% HHs having access to agricultural extension services	12.8	12.5	12.8	14.2
Access to formal safety nets (mean; range 0-2)*	0.08	0.09	0.07	0.09
<i>n</i>	2,776	972	934	870

*(0=no formal safety nets, 1=received either government or NGO support, 2=received both government AND NGO support)

Takeaway 6: Transformative capacity

Transformative capacity levels are low across program areas, ranging from 6.4 in *Nobo Jatra* households to 7.6 in SAPLING households. There are no differences between *SHOUARDO3*, *Nobo Jatra*, and SAPLING households.

What is driving differences?

Differences in components of transformative capacity are mostly observed in access to agricultural extension, but these are not statistically significant.

What is working?

Access to agricultural extension services, while relatively low across all program areas, is fairly evenly distributed.

What could be improved?

Reported access to formal safety nets at the community level is virtually non-existent, indicating an opportunity for government and NGO entities to increase their presence.

8. How resilience capacities explain outcomes

This section explores the relationships between household shock exposure, resilience capacities and key well-being outcomes of interest – household food security, poverty, nutrition, and recovery.

The first part of this section presents several figures that map the three resilience capacity index scores against a diverse set of outcome measures for poverty, food security, income, nutrition, and recovery from shocks. It examines relationships between indicators, such as the relative relationships of the indexes to a given outcome, and the explanatory power of the correlation between a specific resilience index and a given outcome, including the direction and magnitude of any statistically significant relationship. These findings inform our understanding of the kinds of outcomes we can expect given investments in a particular resilience capacity, and give some idea of the direction and degree of this

influence. It is important to emphasize that the following results are based on statistical methods exploring the relationships between resilience capacity and well-being outcomes while controlling for shock exposure. Any positive relationship found between resilience capacities and the well-being outcomes suggest that resilience capacity does improve well-being in the face of shock – or that, for any level of shock exposure, higher levels of resilience capacities improve well-being.

The results presented in this section relate to the magnitude, or strength, of the relationships between resilience capacities and outcomes. Again, these results were generated using multivariate regression analysis in which resilience capacities are treated as a principal determinant of outcomes along with controls for household characteristics, (e.g. wealth, demographics), community characteristics, and exposure to shock. The specifications are described in further detail in Annex C. Full results from all regression models are available in Annex B.

The second part of this section presents a series of graphs that demonstrate the predicted effects of resilience capacity variables – indexes as well as their individual components – that have the strongest positive relationship with key outcomes. Only those resilience capacities that have statistically significant relationships with the outcome variables are shown in these graphs.

8.1 Resilience capacities and individual outcomes

Probability of poverty

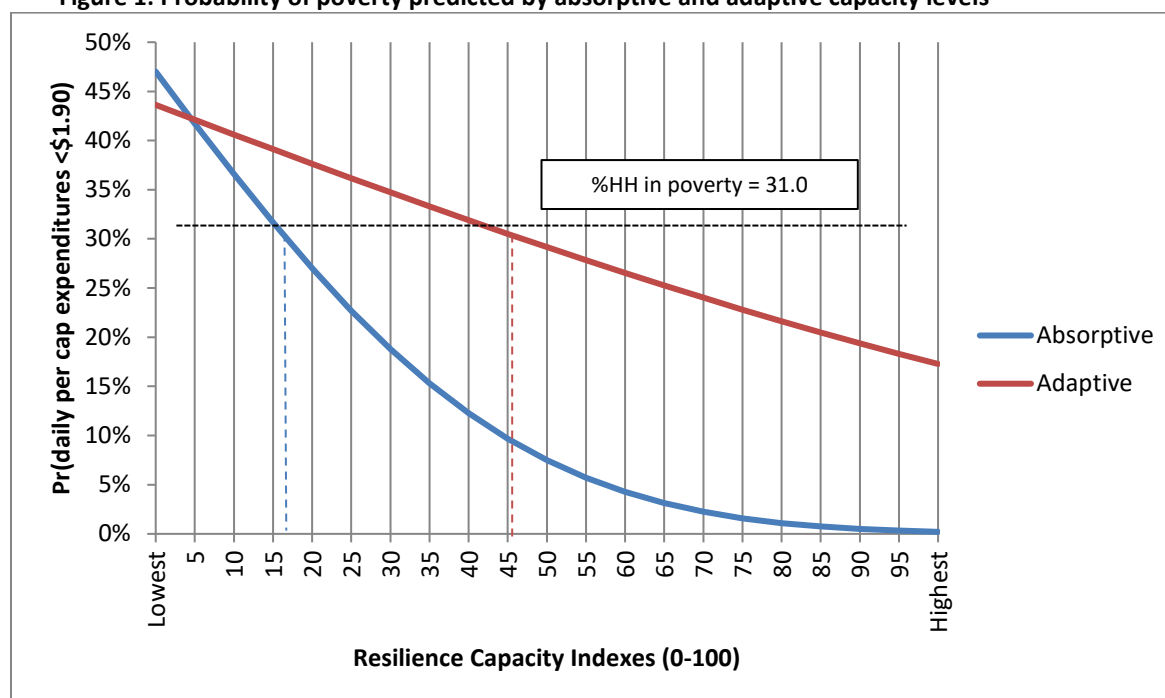
In this report, daily per capita expenditures are a proxy indicator for income. Daily per capita expenditures are directly related to prevalence of poverty because a household is considered poor if daily per capita expenditures are less than \$US1.90 per day. Figure 1 maps the relationship of the probability of poverty against varying levels of the absorptive and adaptive capacity indexes. The full regression results that serve as the foundation of these predicted outcomes are found in Annex B: Table 10. Note that transformative capacity was not found to be statistically related to probability of poverty.

The slope of a curve shows the predicted magnitude of a given capacity's impact on poverty level: a steeper line indicates more impact of a resilience capacity on poverty, while a flatter line indicates less impact. The lines in Figure 1 tell us that both absorptive and adaptive capacities are predicted to have an inverse relationship with poverty, i.e., as these capacity levels increase (left to right along the x-axis), poverty levels decrease (from high to low along the y-axis). The effect is particularly strong for the impact of absorptive capacity on higher levels of poverty, as indicated by a steeper downward curve: at low initial levels of absorptive capacity, even a small increase (e.g., from 5 to 10) in the absorptive capacity scores dramatically reduces the likelihood of poverty, whereas at higher initial levels of absorptive capacity, a similar increase (e.g. from 80 to 85) has a much lower reduction in the likelihood of poverty.

The figure also confirms that at the sample mean values of the resilience capacities (17.4 for absorptive and 45.8 for adaptive), shown by the vertical dotted lines, the predicted likelihood of poverty (31 percent) correspond to the overall poverty rate in the sample.

FINDING 1: Households with higher absorptive and capacity adaptive capacity are less likely to be poor.

Figure 1: Probability of poverty predicted by absorptive and adaptive capacity levels



NOTE: Absorptive and adaptive capacities statistically significant at the 0.01 (***) level.

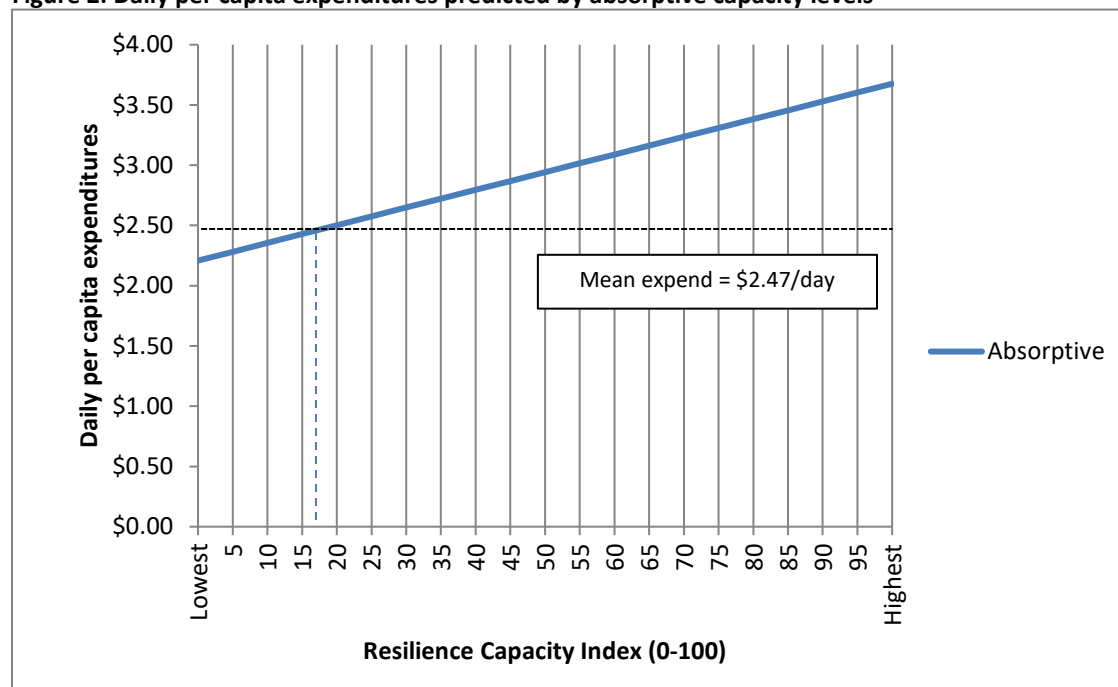
Expenditures

Figure 2 shows the relationship between absorptive capacity and actual daily per capita expenditures (adaptive and transformative capacities were not statistically correlated with per capita expenditures). The mean value of expenditures for the whole sample (US\$2.47/day; see Table 5) is shown as a dotted horizontal line. The data reflect a positive and statistically significant relationship between absorptive capacity and expenditures: as the absorptive scores increases, expenditures also go up (please see Annex B: Table 10 for full regression results). As noted earlier, daily per capita expenditures are a proxy for income and used to measure poverty levels; hence, an increase in daily per capita expenditures suggests that poverty is decreasing. This relationship holds as evidenced in Figure 1 above.

At the sample mean level of the absorptive capacity index shown by the vertical dotted line (16.0), the predicted level of per capita expenditures corresponds to the sample mean value of \$2.47.

FINDING 2: Households with higher absorptive capacity are more likely to earn higher income.

Figure 2: Daily per capita expenditures predicted by absorptive capacity levels



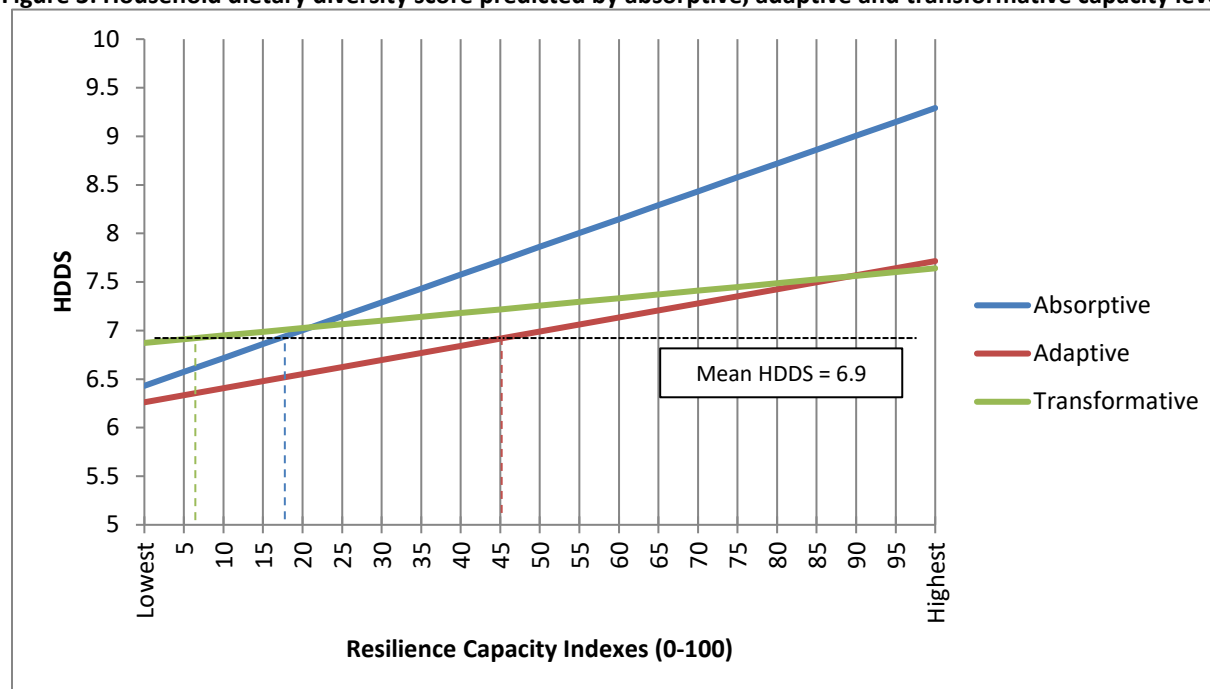
NOTE: Absorptive capacity statistically significant at the 0.01 (***) level.

Household dietary diversity

Figure 3 shows the positive and statistically significant relationships between all three resilience capacities and household dietary diversity score (HDDS) (for full regression results, see Annex B: Table 12). The mean HDDS (6.9 out of a maximum possible score of 12; see Table 5) is shown as a horizontal dotted line. Absorptive and adaptive capacities have a stronger effect on HDDS than transformative capacity, as evidenced by their comparatively steeper slopes. The absorptive capacity index has the steepest slope and intersects the mean HDDS (6.9) at a value of about 7, the sample mean of the absorptive capacity index. The predicted relationship between adaptive capacity and HDDS is positive, but less in magnitude than for absorptive capacity. Finally, transformative capacity has a statistically significant impact on HDDS, but the impact of increasing transformative capacity on HDDS is small, as shown by the flat slope of the line. The low level of impact of this capacity on HDDS may be attributed to the fact that the index is comprised of only two measures, of which access to agricultural extension services is solely accountable for the difference. Overall, this comparison of the slopes of the resilience indexes – the relative size of increases along the y-axis (HDDS) vis-à-vis incremental changes in index scores (x-axis) – suggests that while improving all three kinds of resilience increases dietary diversity, improving absorptive capacity has the highest relative impact.

FINDING 3: All three resilience capacities contribute to greater household dietary diversity, with absorptive capacity having the greatest impact.

Figure 3: Household dietary diversity score predicted by absorptive, adaptive and transformative capacity levels



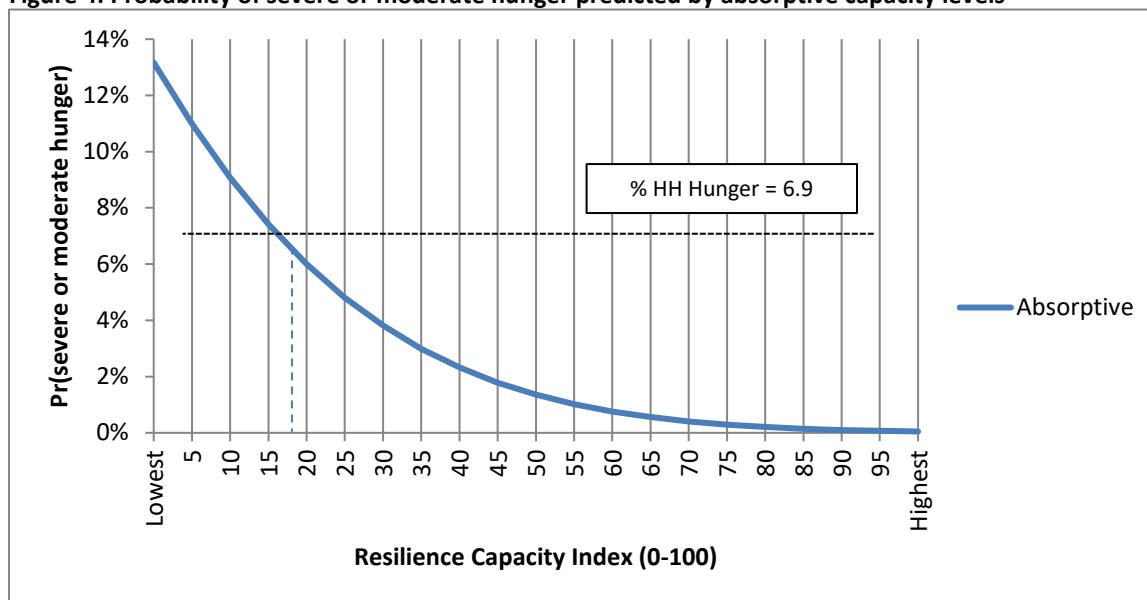
NOTE: All capacities statistically significant at the 0.01 (***) level.

Hunger

Figure 4 plots probability of severe or moderate hunger against different levels of the absorptive capacity index values. (Adaptive and transformative capacities are not statistically significantly correlated with hunger as shown in Annex B: Table 13). A low probability is the desired outcome for this indicator, and the graph shows that higher levels of absorptive capacity do in fact reduce the probability of hunger in the face of shocks. As in the previous figures, a dotted horizontal line represents the sample mean of the probability of hunger, and the dotted vertical line represents the sample mean of the absorptive capacity index.

FINDING 4: Households with higher absorptive capacity are less likely to have moderate or severe hunger.

Figure 4: Probability of severe or moderate hunger predicted by absorptive capacity levels

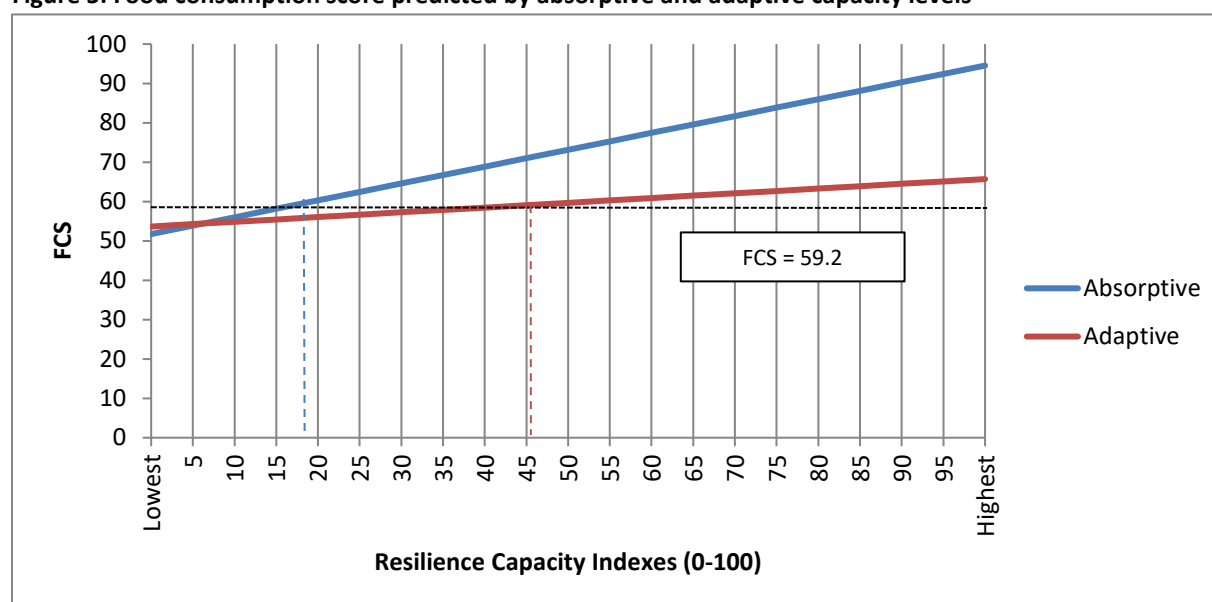


NOTE: Absorptive capacity statistically significant at the 0.01 (***) level.

Food consumption score

Figure 5 shows the relationship between food consumption scores (FCS) and the absorptive and adaptive resilience capacities. (Transformative capacity is not statistically correlated with the FCS.) The mean FCS score (59.2 out of 112; see Table 5) is shown as a dotted horizontal line. Sample mean values of absorptive and adaptive capacities are shown as vertical lines. A higher FCS score is desirable, as it indicates that households are consuming a more diverse and nutritious diet with more frequency. Of the two resilience capacities, absorptive (blue line) has the stronger impact on food consumption evidenced by a steeper slope compared to adaptive capacity (red line); the steeper the line, the stronger the influence in greater change in the dependent variable (here, FCS). However, neither have a strong influence on FCS as noted in the general flatness of the slopes.

Figure 5: Food consumption score predicted by absorptive and adaptive capacity levels



NOTE: Absorptive and Adaptive capacities statistically significant at the 0.01 (***) level.

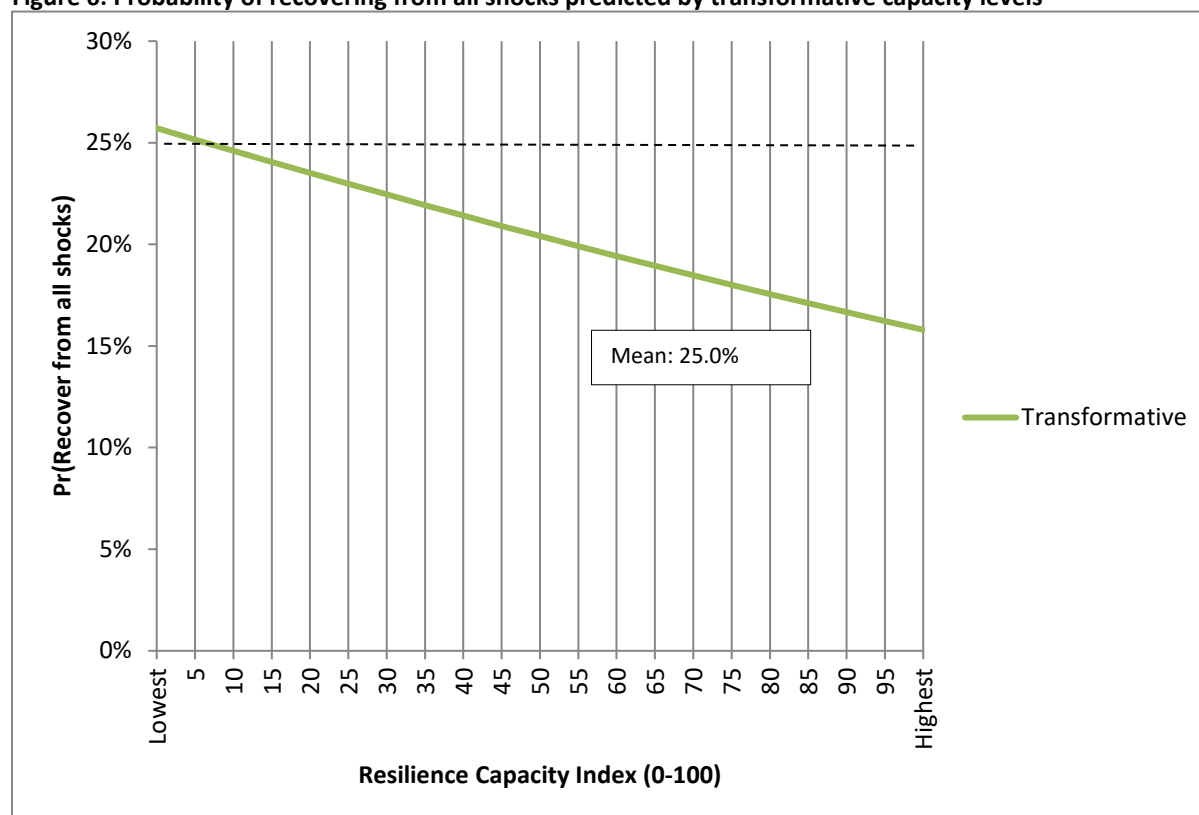
FINDING 5: Households with higher absorptive and adaptive capacity are more likely to consume a more diverse and nutritious diet, although the influence of either is not very strong.

Recovery from shocks

Figure 6 shows the probability of recovering from all shocks against transformative capacity index values; neither absorptive nor adaptive capacities are found to have a statistically significant relationship with the probability of shock recovery and are not presented. For this binary variable, a score of 1 indicates a household was able to recover from all of the shocks experienced in the past 12 months and a 0 indicates not having achieved recovery. The percentage of households considered to have recovered from all shocks is 25.0 percent and is represented by the dotted horizontal line.

The unexpected negative slope of transformative capacity is driven largely by access to formal safety nets (please refer to Table 15 in Annex B for the parameter estimates). A likely explanation might be that households receiving assistance were identified by formal agencies (NGOs and Governmental) as less able to recover. Although counter-intuitive at first glance, this result may reflect effective targeting of formal safety nets to the most vulnerable households, who in turn are less likely to recover from shocks. It may be that without access to formal safety nets, these households would have been even less likely to recover from the shocks they were exposed to.

Figure 6: Probability of recovering from all shocks predicted by transformative capacity levels



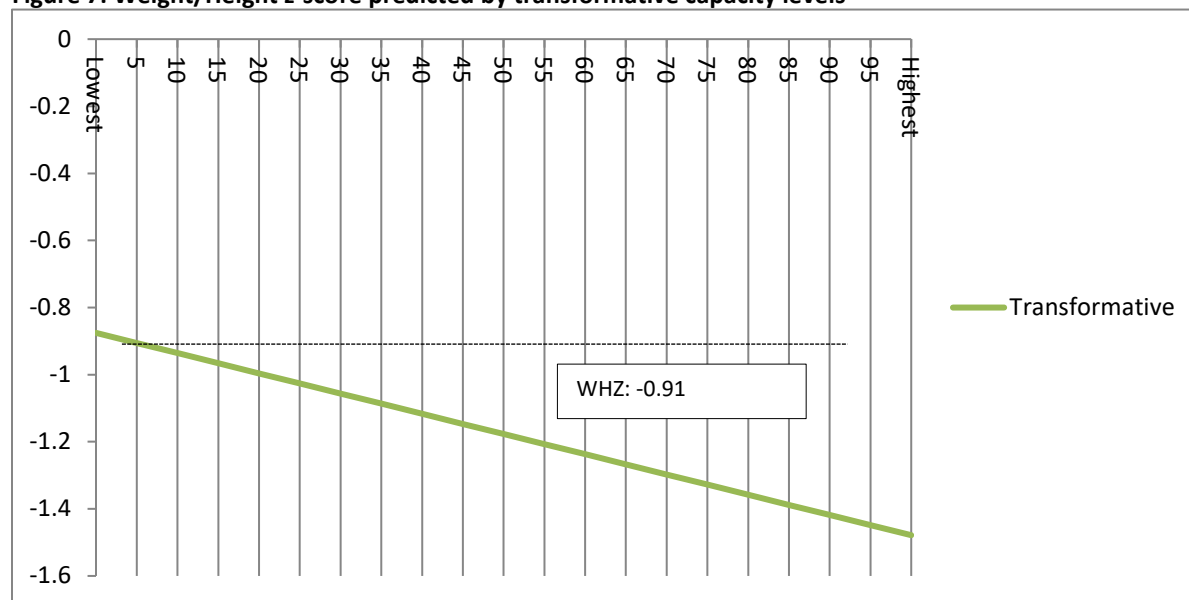
NOTE: Transformative capacity statistically significant at the 0.01 (***) level.

FINDING 6: Transformative capacity is negatively associated with recovery from all shocks experienced in the past 12 months. Access to formal safety nets is the primary driver behind this finding, indicating formal agencies are appropriately targeting households less able to recover.

Weight/Height z-score (WHZ)

Figure 7 shows a negative relationship between WHZ scores and transformative capacity index values. The negative slope of transformative capacity is driven largely by access to agriculture extension services that measures whether a household received any one of 13 services provided by Government of Bangladesh (please refer to Table 16 in Annex B for the parameter estimates). Similar to recovery, this may reflect that the government is accurately targeting households that are worse off nutritionally.

Figure 7: Weight/Height z-score predicted by transformative capacity levels



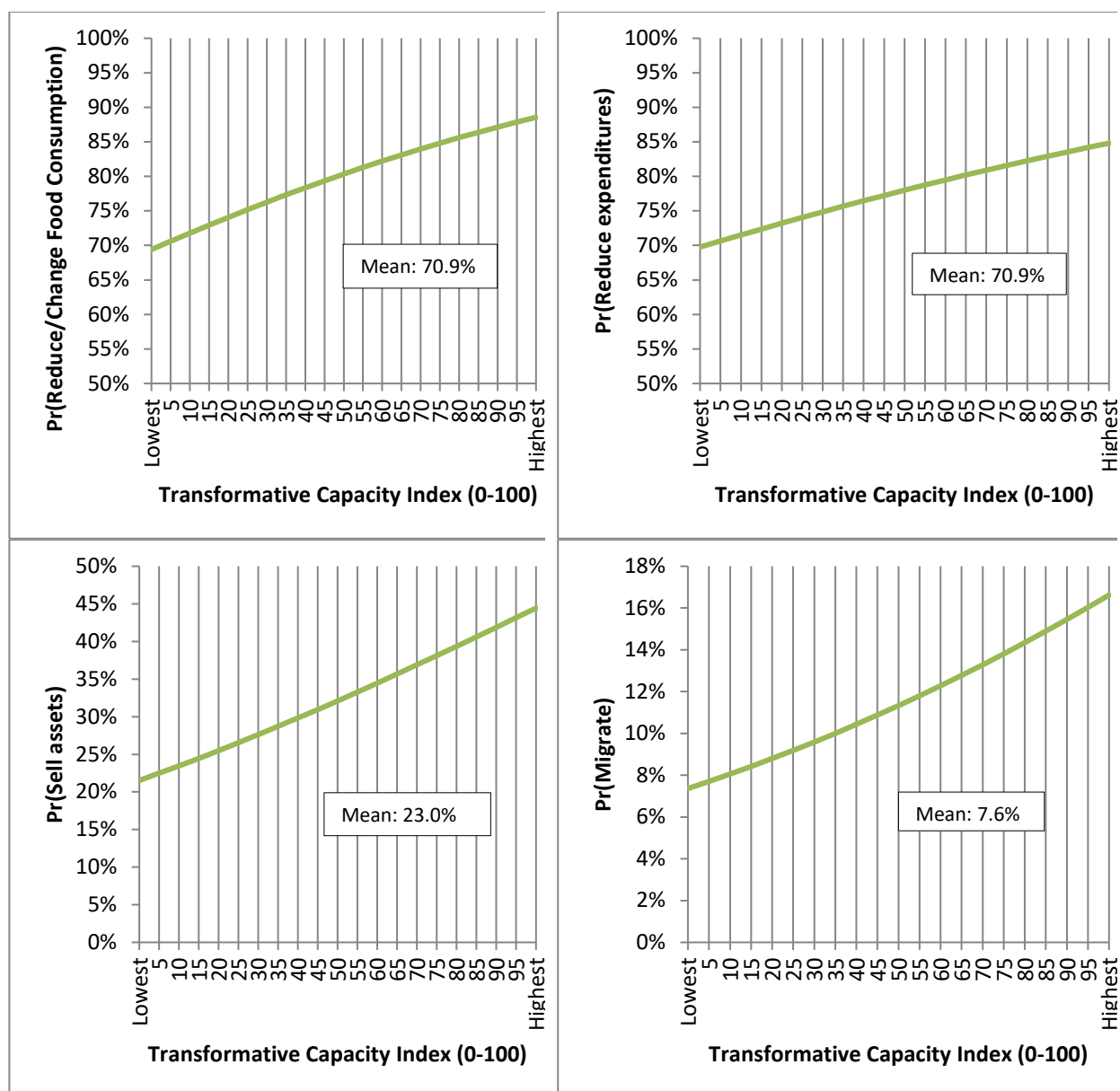
NOTE: Transformative capacity statistically significant at the 0.01 (***) level.

FINDING 7: Transformative capacity negatively impacts the WHZ scores of children 0-59 months of age. Similar to recovery, this may reflect that the government is accurately targeting households that are worse off nutritionally.

Coping strategies

Analysis was conducted to examine whether higher levels of resilience capacities reduced reliance on coping strategies. The four coping strategies include reduce/change food consumption, reduce expenditures, sell assets, and migrate and each are treated as a binary where a “1” indicates adoption of the strategy and a “0” indicates no adoption. The results show the only significant relationship with coping strategies is with transformative capacity (please refer to Annex B: Table 17-Table 20 for full results). A closer look at the driving component of transformative capacity for each coping strategy, access to formal safety nets, reveals that households who received assistance from either Governmental or NGO agencies, or both, were exposed to more shocks, and hence, more vulnerable (no formal safety net support = 7.7, received formal safety net support = 8.8, $p < 0.05$), and therefore more likely to adopt coping strategies.

Figure 8: Coping strategies predicted by transformative capacity



NOTE: Transformative capacity statistically significant at the 0.01 (***) level.

FINDING 8: Transformative capacity is positively associated with higher use of coping strategies. The main driver behind this finding, access to formal safety nets, suggests worse-off households, or those who experienced more shocks, are appropriately targeted by Governmental/NGO agencies.

8.2 Unpacking absorptive, adaptive, and transformative capacities: The strongest relationships

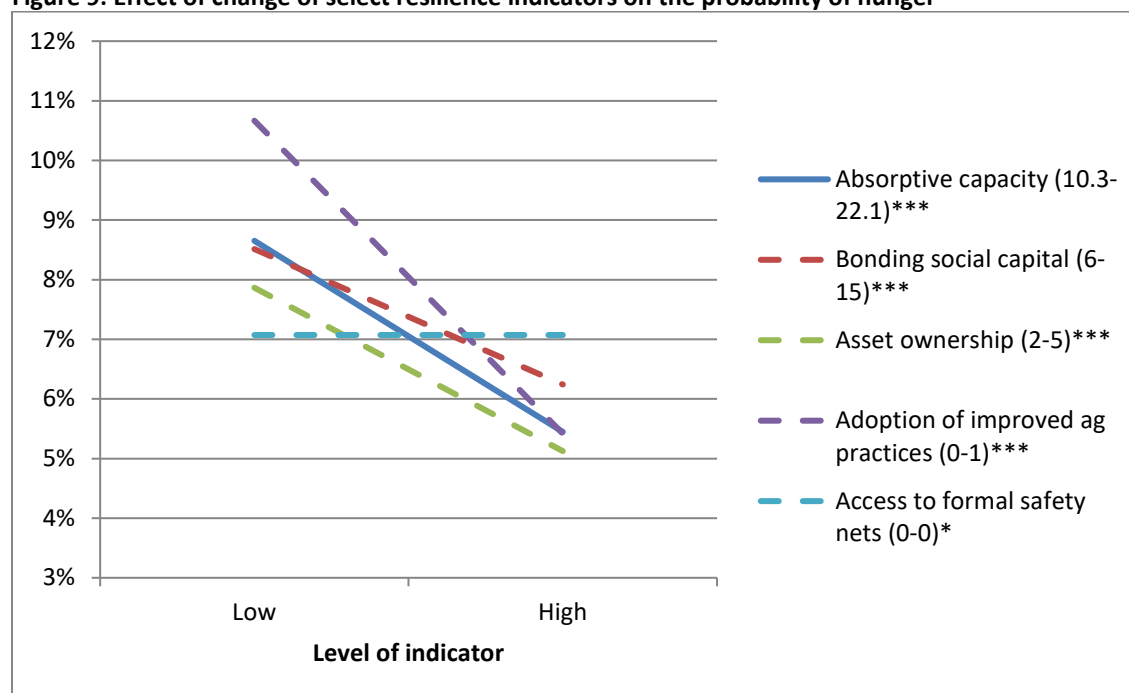
The following series of analyses focuses on how changes in components of the resilience capacity indexes are predicted to affect different outcomes. They focus on the particular components that have the strongest predictive effects in terms of statistical significance, magnitude, and direction, based on the principal regression specification described in Annex C. Therefore, the reduction of hunger and poverty are the well-being outcomes of interest. These analyses differ from the previous discussions because they not only focus on the resilience capacities that are statistically significant and most powerful, but it also compares them with statistically significant component variables, i.e., individual variables that form part of the indexes. The intent of this approach is to examine the extent to which a combination of variables (i.e., as defined by a given index) has a stronger (or weaker) effect on a particular outcome than any individual variable.

The resilience capacities are plotted along the x-axis using two points of reference, the “low” values of the variable (25th percentile in the sample), and “high” values of the variable (75th percentile of the sample). Solid lines specify the resilience capacity index variable and component variables of that index are dotted lines. The legend indicates the 25th and 75th percentile values, respectively, of indicators measured as continuous variables. This permits comparability across variables that use different scales. In other words, the change from left to right along the x-axis for any explanatory continuous variable is the distance between the 25th and 75th percentile values of that variable. For binary variables, i.e., variables whose values is either 0 (absence of) or 1 (presence of), the change noted is not connected to percentiles. Rather, change is defined as the difference between *absence of* and *presence of* (for example, not having any savings versus having savings). In each of the following figures, the y-axis represents the probability of a particular outcome.

Hunger

Figure 9 plots the probability of hunger against five variables with strong and statistically significant relationships with this outcome. One is a resilience capacity index (absorptive, shown as a solid blue line) and the rest are component variables of the respective capacity index (dotted lines). For the aggregate indicator of absorptive capacity, hunger decreases by 3.2 percent moving from the 25th to the 75th percentile (10.4 to 22.1, respectively). With respect to individual components, the most powerful component in terms of effects on hunger is adoption of improved agricultural practices. This is measured using a binary variable that indicates households were engaged in at least 1 of 3 improved agricultural practices. Households using improved agricultural practices are predicted to have about a 5.4 percent probability of experiencing hunger, compared to a 10.7 percent probability for those not engaging in improved agricultural practices. Asset ownership and bonding social capital lower the probability of hunger by nearly the same amount (2.8 percent and 2.3 percent, respectively). It is important to keep in mind that the percentage of households in the sample experiencing hunger is quite low (6.9 percent, from Table 5). Overall, these findings indicate that adoption of improved agricultural practices, stronger social bonds with others in the community, and investment in more asset holdings have significant impacts on reducing hunger.

Figure 9: Effect of change of select resilience indicators on the probability of hunger



NOTE: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

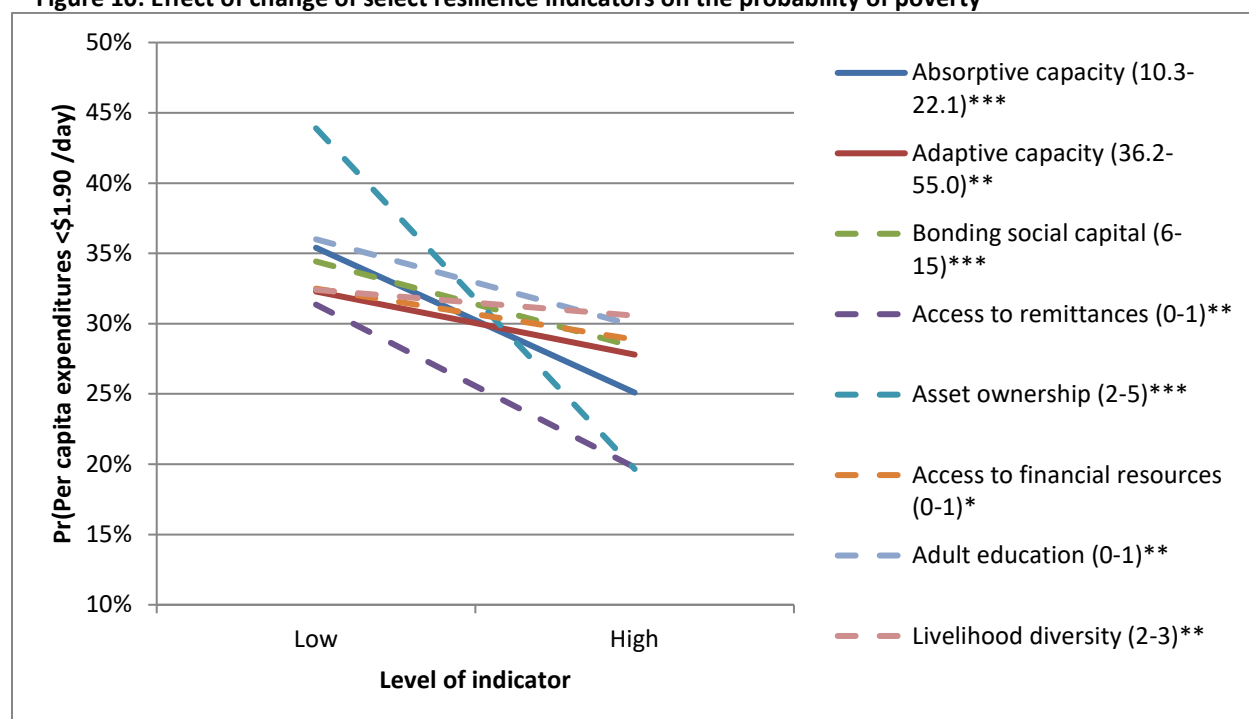
FINDING 9: Adoption of improved agricultural practices has the strongest influence on reducing hunger more than any of the other four measures; those who engage in such practices are twice as likely to NOT experience hunger (10.7 percent hunger in households that do not engage versus 5.4 percent hunger among households engaged in improved agricultural practices.)

Poverty

Figure 10 graphs the probability of poverty (as measured by per capita expenditures) against eight resilience capacities with strong and statistically significant relationships (for full results, see Annex B: Table 28). Two are the absorptive and adaptive capacity indexes (solid blue and red lines), while the remaining lines are the components of these two resilience capacities, respectively (shown as dotted lines in the figure). Both absorptive and adaptive capacities are significantly associated with decreases in the probability of poverty, with decreases of 10.3 percent and 3.6 percent respectively associated with movement from the 25th to the 75th percentile of these aggregate indicators. With respect to individual components, the steep slope for asset ownership indicates dramatic reductions of poverty; households that gain three asset categories (from 2 to 5) improve their chances of moving out of poverty by roughly 21 percent (from 41.7 percent to 20.7 percent). Households with access to remittances are predicted to make the second-most powerful improvements with respect to poverty. Households with access to remittances have an 11 percent lower probability of poverty compared to households without remittances. Increased bonding social capital also accounts for a significant decrease in poverty; at the 25th percentile, the likelihood of being in poverty is about 35 percent and moving to the 75th percentile

reduces that to about 28 percent. Households with at least one adult in the household with a primary or higher level of education accounts for a reduction in poverty by 5.4 percent. Finally, households with access to financial resources have a 3.4 percent lower likelihood of poverty compared to those without access to financial services.

Figure 10: Effect of change of select resilience indicators on the probability of poverty



NOTE: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

FINDING 10: Similar to hunger, several components of resilience capacity have a direct influence on reducing poverty. However, asset ownership reduces poverty more than any single other measure alone. Movements from the bottom quarter of asset ownership to the highest quarter of households surveyed reduce the chances a household will be poor by roughly 20 percent.

9. Conclusions

Using data from the 2015 Baseline Study of the *SHOUHARDO3*, *Nobo Jatra*, and SAPLING development food assistance projects, this study provides a glimpse into household well-being and recovery from shocks experienced in the 12 months prior to the study. The study identifies various factors that strengthen household resilience in Bangladesh. This section provides summary conclusions that address the two research questions posed for this study.

Research question 1: Do resilience capacities mitigate the negative effects of shocks for select well-being outcome indicators, including poverty, dietary diversity, hunger, and wasting among children?

- **Improvements in absorptive capacity is likely to lead to lower poverty, higher incomes, less hunger, and a more diverse diet.** Not only does it relate significantly to more outcomes than either adaptive or transformative (poverty, expenditures, dietary diversity, hunger, and food consumption scores), but it behaves according to theoretical specifications (e.g., direction of relationship is consistent, magnitude of estimates are strong).
- **Adaptive capacity significantly predicts poverty, dietary diversity and food consumption scores and adheres to expected directions.** While significant, the magnitude of adaptive capacity estimates associated with outcomes are not as strong as absorptive.
- **Transformative capacity, as measured in this study, is not strongly associated with outcomes.** Transformative capacity is marginally, and positively associated with dietary diversity and coping, but has the opposite relationship with recovery and wasting. The relative weakness of the relationship observed between transformative capacity and outcomes may be a reflection of how data used to measure transformative capacity were captured in the baseline survey. Ideally, the community-level capacities that serve as the foundation for transformative capacity are captured as part of a community-level survey conducted with local leaders, or knowledgeable members of the respective community. In the case of this baseline survey, information regarding these community capacities was sourced directly from household respondents and only for two indicators.

In addition, the questions are quite divergent from the more common approach. For instance, access to formal safety nets is typically an assessment of whether programs exist or not in a community to help households cope with the negative impacts of shocks. In this baseline survey, the variable is a measure may be slightly misleading as it takes into account only households who received help. The distinction here is access to such services, and we cannot assume that households who accessed services necessarily implies that such services exist for other communities. Future evaluations of the *SHOUHARDO3*, *Nobo Jatra*, and *SAPLING* projects ought to include community-level surveys administered to key informants in the community.

- **In the context of resilience capacity, there is evidence of opportunities available for improving well-being outcomes directly through increases in household assets and stronger bonding social capital.** Evidence suggests that absorptive and adaptive capacities contribute to improved well-being outcomes in the face of shock. Some of their underlying components, specifically increases in household assets and bonding social capital, are consistently and directly associated with reduced hunger and poverty outcomes. Other indicators that are significant predictors of reduced hunger include increased adoption of improved agricultural practices and greater access to formal safety nets, while greater access to remittances, access to financial resources, higher education levels and greater livelihood diversity directly support a reduction in poverty.

Research question 2: What is the relationship between resilience capacities and adoption of coping strategies to recover from shocks?

- **Households with higher levels of transformative capacity tend to use more coping strategies to recover from shock.** This positive association with higher use of coping strategies is driven primarily by access to formal safety nets. This result may be explained by effective targeting of formal safety nets – households that receive formal assistance are likely to be more vulnerable, and therefore more likely to use coping strategies than less vulnerable households that do not benefit from formal safety nets.

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Annex A. Resilience Indicators for Bangladesh

1. Calculation of measures of resilience

1.1. Absorptive capacity index

The absorptive capacity index is constructed from six indicators, some of which are themselves indices. The indicators and explanations of their calculation are as follows.

1. **Access to informal safety nets.** This indicator is computed based on information in R312 and R313. Households that receive money from friends/neighbors (R312 = 1) or relatives/family (R312 = 2) **and** the conditions of borrowing are either without interest (R313 = 1) or reciprocity (R313 = 3), households are considered to have utilized informal safety nets. The informal safety net index is computed by the number of 'severe' shocks that households have relied on informal safety nets, based on the responses to R312 and R313 for each shock. This index ranges from 0 to 5.

Survey questions: R312 and R313.

2. **Bonding social capital index.** The bonding social capital index is based on information from about personal social networks captured in questions R601- R610. The index is computed by adding the number of friends who can provide advice (R602), can lend money to the respondent (R604), lend food to the respondent (R606), can provide paid work (R608), and the number of times the household has been invited to a social gathering (R610). Note that if the households report that they do not have access to any of these forms of social capital (R601, R603, R605, R607, R609 = 0), then the value assigned to the corresponding number of contacts for that social capital is assigned to equal 0.

Survey questions: R601 – R610

3. **Whether any household member holds savings.** This indicator is computed from positive responses to G08a. It asks, "Did you save any cash through any of the following formal institutions in the (past 12 months)?"

Survey questions: G08a

4. **Access to remittances.** This indicator is a binary (dummy) variable equal to 1 if the respondent reported purchasing any food items using remittances, C03.2 – C14.2 have values of 3 or 4.

Survey questions: C03.2 - C14.2

- 5. Asset ownership index.** Asset ownership is measured using the number of consumer durables owned out of a total of 18.⁹

Survey questions: H7.02

- 6. Shock preparedness and mitigation.** This index is based on information about household preparedness plans related to farming activities (R324) and non-farming activities (R325). The index is computed by summing up the 'yes' values of R324 and R326 across the 5 'severe' shocks reported by each household. The index ranges from 0 to a possible maximum of 10.

Survey questions: R324, R326

Combine the six indicators described into an absorptive capacity index using polychoric factor analysis.

1.2 Adaptive capacity index

The adaptive capacity index is constructed from eight indicators, some of which are indices themselves. The indicators and calculation explanations are as follows.

1. Human capital. This binary (dummy) variable is equal to 1 if any household adult has a primary or higher education. This is computed by using the information about age and level of education attained for each household member, in Module B, (B05 and B21). If any household member age 16 or older (B05 > 15) has value of B21 between 1 and 5, the value of this variable is set to 1.

Survey questions: B05, B21.

2. Livelihood diversification. The livelihood diversification variable is computed by summing the number of activities (out of a possible 16) the household was engaged in over the past 12 months:

- Agriculture
- Agriculture day labor
- Fish business
- Livestock rearing
- Homestead gardening
- Temporary migration for off-farm day labor
- Temporary migration for agriculture day labor
- Small business
- Tube well/WASH mechanics
- Government or private service

Mobile mechanics
Asset investment
Transport vehicle driver
Agriculture day labor
Other day labor
Other

Survey questions: C204a – C219a.

3. Adoption of improved practices. This binary (dummy) variable is equal to 1 if respondents report adopting three or more improved practices for crop production, including vegetables (G13B) OR respondents report adopting three or more improved practices for livestock production (G16) OR respondents report following one natural resource management practice or technique not related directly to on-farm production (G18) OR respondents report using any improved storage method.

Survey questions: G13B, G16, G18, G21

4. Asset ownership index. See above.

5. Access to financial resources. The variable is equal to zero if a household did not take any agricultural credit from an institution in their community and a one if they did based on responses to G07.

Survey question: G07

Combine these five indicators into an index using polychoric factor analysis.

1.3 Transformative capacity index

The transformative capacity index is constructed from two indicators, some of which are indexes themselves. The indicators and calculation explanations are as follows.

1. Access to formal safety nets. This index variable is based on the types of formal assistance households received in response to 'severe' shocks in R501 and R502. The index has the following values:

Household received no governmental or non-governmental forms of assistance = 0

Household receive governmental or non-governmental assistance only = 1

Household received both governmental and non-governmental assistance = 2

Survey questions: R501, R502

2. Access to agricultural services. This variable is based on a binary (dummy) variable equal to 1 if the household reports that they received agricultural services. This variable has a

value of 1 if households responded yes (1) to at least one of the variables G09AI,...G09JI, and 0 otherwise.

Survey questions: G09AI, G09BI, G09CI, G09DI, G09EI, G09FI, G09GI, G09HI, G09II, G09JI

Combine the indicators into a transformative capacity index using polychoric factor analysis.

Additional Resilience indicators

2.1 Exposure to shock

Exposure to shock is measured as the number of shocks or stresses experienced in the last 12 months. Although the questionnaire provides a list of 32 different types of shocks, respondents were allowed to select up to 12, therefore, the shock exposure index ranges from 1-12.

Survey questions: R101

2.2 Severity of shock

Severity of shock is based on the question “Last time you faced this EVENT tell us how ‘severe’ this was/is for your family”. Response options for severity include: 4 = Very bad, 3 = Quite bad, 2 = A little concerning, 1 = We handled it with no problem, and 0 = Eventually it brought some positive outcomes. The total score is a combination of total number of ranked shocks (maximum of 5) * the severity level for each shock, resulting in a range from 0 to 20.

Survey questions: R105

2.3 Recovery from shock

Recovery from shock is based on the question: “With respect to [SHOCK], how do you consider you managed to recover after the event?” The variable is ordinal ranging from 0-3:

0 = Did not recover at all and I don’t think I will be able to recover

1 = Not yet fully recovered and it will be difficult/long OR Not yet but I think we will

2 = Have fully recovered – but it was long and painful OR Have fully recovered – and it was not too difficult

3 = Have fully recovered and I am better off now

Survey questions: R401

2.4 Coping strategies

Four coping strategies employed as responses to shock are calculated for this study:

- Reduced/changed food consumption
- Reduced the level of expenses
- Sell assets
- Migration

Survey questions: R302, R305, R308, R316, R318

2.5 Gender-equitable decision-making indexes

These indexes are based on binary (dummy) variables created regarding two types of decision-making control within households: control of income, control over use of savings, and control over health and nutrition decisions.

The first index, **gender-equitable control of income**, uses responses from the first male and female eligible persons from the roster who state they have been paid in “cash only” or “cash and kind” or “in kind only” for work done in the past 12 month (J07 = 1 or 2 or 3). Households without a male and female responding to Module J are excluded. The variable is equal to one if male respondents report they participate (solely or jointly, J10 = 1 or 3 or 4) in decisions on how cash they themselves have earned is used AND female respondents also report they participate (solely or jointly, J10 = 1 or 3 or 4) in decisions on how cash they themselves have earned is used. The variable is equal to 0 if either males or females in a household report that “spouse/partner” or “other person” makes this decision (J10 = 2).

The second variable, **gender-equitable control over health and nutrition decisions** uses responses from the first male and female from the household roster who state they have a child under 2 years (K05). Households without a male and female responding “yes” to K05 are excluded. The variable is equal to one if female respondents report they make decisions about their own health and nutrition (K14 = 1 for female respondents, K14 = 2 for male respondents) AND female respondents also report they participate jointly in decisions about their child’s health and nutrition (K15 = 3 or 4) AND male respondents report they participate jointly in decisions about their child’s health and nutrition (K15 = 3 or 4). The variable is equal to 0 if all three conditions are not met.

Survey questions: J07, J10, K05, K14, K15

Annex B. Supplemental Tables and Figures

Table 9: Percent of households engaged in different livelihoods

Type of Livelihood	Program area			
	All	SHOUHARDO3	Nobo Jatra	SAPLING
	(% HHs)			
Agriculture	60.9	62.3 ^a	55.1 ^a	75.7 ^a
Agriculture day labor	38.4	45.9	25.7	33.0
Livestock rearing	38.1	38.0	38.3	37.9
Other day labor	20.2	17.0	26.7	16.8
Temporary migration for off-farm day labor	19.0	17.9 ^a	24.1 ^a	4.4 ^a
Temporary migration for agriculture day labor	17.5	19.9 ^a	16.3 ^b	3.2 ^{ab}
Small business	17.0	14.7 ^a	21.6 ^{ab}	15.2 ^b
Fish business	11.2	6.2 ^a	22.3 ^a	1.6 ^a
Homestead gardening	8.1	5.0 ^{ab}	13.0 ^a	11.9 ^b
Government or private service	8.1	6.2 ^{ab}	11.0 ^a	10.3 ^b
Transportation driver	8.1	7.3	10.4 ^a	4.7 ^a
Aquaculture day labor	7.5	4.4 ^a	14.8 ^a	0.5 ^a
Asset investment	4.5	2.8 ^a	8.0 ^{ab}	3.1 ^b
Tube well mechanics, WASH mechanics	0.4	0.4	0.4	0.0
Mobile mechanics	0.1	0.1	0.2	0.0
Other livelihood	14.0	14.9 ^a	13.8 ^b	6.8 ^{ab}

^{a,b} Subgroups with the same superscript are significantly different at the 0.05 level. Comparisons are across columns.

Table 10: Relationship between resilience capacity indexes and expenditures

Dependent Variables (D.V.): Per capita expenditures OLS estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.0147***		
Adaptive capacity		-0.000599	
Transformative capacity			0.00152
Shock Severity Index (0-20)	0.00209	0.00312	0.00704
Household demographics (/Percent 30+)			
Percent 0-15	-1.310***	-1.301***	-1.293***
Percent 16-30	-0.459***	-0.441***	-0.480***
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	0.344***	0.326***	0.394***
Adult Male no Adult Female	0.270**	0.271**	0.334***
Women's decision making (0-8)	-0.0574***	-0.0601***	-0.0526***
Project (/SHOUHARDO3)			
Nobo Jatra	-0.253***	-0.323***	0.215
SAPLING	0.466***	0.382***	1.230***
Asset ownership index (0-15)	0.171***	0.221***	0.229***
Constant	1.938***	2.088***	2.119***
Observations	2757	2763	2763
Fixed effect	EA	EA	District
R2	0.476	0.469	0.399

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 11: Relationship between resilience capacity indexes and poverty

Dependent Variables (D.V.): Poverty Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	-0.0346***		
Adaptive capacity		-0.0102**	
Transformative capacity			-0.00161
Shock Severity Index (0-20)	-0.00968	-0.00943	-0.0105
Household demographics (/Percent 30+)			
Percent 0-15	1.360***	1.323***	1.333***
Percent 16-30	-0.0693	0.106	-0.0805
Household size	0.154***	0.162***	0.155***
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	-0.295	-0.267	-0.226
Adult Male no Adult Female	0.223	0.184	0.215
Women's decision making (0-8)	0.0329	0.0381	0.0321
Project (/SHOUHARDO3)			
Nobo Jatra	-0.0635	-0.117	-0.120
SAPLING	-1.817***	-1.793***	-1.741***
Asset ownership index (0-15)	-0.231***	-0.270***	-0.329***
Constant	-0.503**	-0.524**	-0.698***
Observations	2757	2763	2763
Fixed effect	District	District	District
R2	N/A	N/A	N/A

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 12: Relationship between resilience capacity indexes and household dietary diversity outcome

Dependent Variables (D.V.): HDDS OLS estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.0286***		
Adaptive capacity		0.0145***	
Transformative capacity			0.00768***
Shock Severity Index (0-20)	0.00605	0.00664	0.0143
Household demographics (/Percent 30+)			
Percent 0-15	0.141	0.197	0.245
Percent 16-30	0.190	0.00533	0.326
Household size	0.0708***	0.0599**	0.0685***
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	-0.147	-0.106	-0.0939
Adult Male no Adult Female	-0.567	-0.505	-0.0339
Women's decision making (0-8)	0.0139	0.00388	0.0338
Project (/SHOUHARDO3)			
Nobo Jatra	-0.124	-0.330***	-0.0906
SAPLING	-0.251***	-0.353***	0.767**
Asset ownership index (0-15)	0.146***	0.157***	0.263***
Constant	4.815***	4.797***	5.497***
Observations	2628	2634	2634
Fixed effect	EA	EA	District
R2	0.332	0.329	0.215

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 13: Relationship between resilience capacity indexes and household hunger

Dependent Variables (D.V.): Severe or Moderate Hunger Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	-0.0233***		
Adaptive capacity		-0.000689	
Transformative capacity			0.00239
Shock Severity Index (0-20)	-0.00342	-0.00466	-0.00521
Household demographics (/Percent 30+)			
Percent 0-15	-0.0415	-0.0615	-0.0525
Percent 16-30	-0.107	-0.0951	-0.0959
Household size	-0.0227	-0.0189	-0.0203
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	0.219	0.256	0.264
Adult Male no Adult Female	0	0	0
Women's decision making (0-8)	0.0529	0.0530	0.0547
Project (/SHOUHARDO3)			
Nobo Jatra	-0.249	-0.287	-0.294
SAPLING	-0.244	-0.240	-0.227
Asset ownership index (0-18)	-0.0877**	-0.155***	-0.160***
Constant	-0.236	-0.344	-0.364
Observations	2664	2670	2670
Fixed effect	District	District	District
R2	N/A	N/A	N/A

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 14: Relationship between resilience capacity indexes and food consumption score

Dependent Variables (D.V.): FCS OLS estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.428***		
Adaptive capacity		0.121***	
Transformative capacity			0.0252
Shock Severity Index (0-20)	-0.0606	-0.0452	0.0628
Household demographics (/Percent 30+)			
Percent 0-15	-4.564*	-4.149*	-4.572*
Percent 16-30	-0.331	-1.920	-0.450
Household size	1.618***	1.503***	1.520***
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	-0.294	-0.192	-0.126
Adult Male no Adult Female	-1.632	-1.007	2.288
Women's decision making (0-8)	0.615*	0.472	0.397
Project (/SHOUHARDO3)			
Nobo Jatra	9.997***	7.633***	-2.889
SAPLING	7.542***	6.070***	4.101
Asset ownership index (0-18)	1.177***	1.873***	2.716***
Constant	31.22***	32.67***	46.86***
Observations	2754	2760	2760
Fixed effect	EA	EA	District
R2	0.328	0.314	0.216

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 15: Relationship between resilience capacity indexes and recovery

Dependent Variables (D.V.): Recovery Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.00682		
Adaptive capacity		-0.00422	
Transformative capacity			-0.00403*
Shock Severity Index (0-20)	-0.112***	-0.112***	-0.112***
Household demographics (/Percent30+)			
Percent 0-15	0.141	0.150	0.148
Percent 16-30	0.409**	0.487**	0.413**
Household size	0.00633	0.00717	0.00537
Gender HH type (/Adult Male and Female)			
Adult Female no Adult Male	0.131	0.0961	0.113
Adult Male no Adult Female	-0.244	-0.266	-0.272
Women's decision making (0-8)	0.0271	0.0298	0.0268
Project (/SHOUHARDO3)			
Nobojatra	0.942***	0.955***	0.950***
SAPLING	0.255*	0.224	0.234
Asset ownership index (0-15)	0.00332	0.0498*	0.0276
Constant	-1.115***	-1.002***	-1.063***
Observations	2757	2763	2763
Fixed effect	District	District	District

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 16: Relationship between resilience capacity indexes and weight/height z-scores

Dependent Variables (D.V.): Weight/Height z-score OLS estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.00123		
Adaptive capacity		0.00394	
Transformative capacity			-0.00592*
Shock Severity Index (0-20)	-0.00473	-0.00481	-0.0107
Age in months for children under 5 years of age	-0.00970***	-0.00955***	-0.0102***
Total children < 5 years of age	-0.0496	-0.0522	0.0519
Household size	0.0410	0.0412	0.0259
Household using improved source of drinking water	-0.128	-0.122	-0.0683
Household used an improved sanitation facility	-0.0881	-0.0795	-0.0987
Children Diarrhea	-0.210	-0.218	-0.205**
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	0.137	0.154	0.161
Adult Male no Adult Female	-0.0846	-0.0654	-0.322
Project (/SHOUHARDO3)			
Nobo Jatra	-2.433***	-2.433***	-0.140
SAPLING	-1.654***	-1.623***	0.329
Asset ownership index (0-12)	0.0367	0.0182	0.0312
Constant	1.054***	0.940***	-0.596**
Observations	892	893	893
Fixed effect	EA	EA	District
R2	0.332	0.333	0.118

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 17: Relationship between resilience capacity indexes and reducing food consumption (coping strategy)

Dependent Variables (D.V.): Reduce food consumption Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	-0.00132		
Adaptive capacity		0.00104	
Transformative capacity			0.00811***
Shock Severity Index (0-20)	0.105***	0.105***	0.105***
Household demographics (/Percent30+)			
Percent 0-15	0.254	0.246	0.257
Percent 16-30	0.0458	0.0319	0.0524
Household size	-0.0215	-0.0210	-0.0203
Gender HH type (/Adult Male and Female)			
Adult Female no Adult Male	-0.291*	-0.280*	-0.270
Adult Male no Adult Female	-0.752*	-0.747**	-0.706*
Women's decision making (0-8)	0.0000507	-0.0000400	0.00236
Project (/SHOUHARDO3)			
Nobojatra	0.338	0.336	0.330
SAPLING	-0.897***	-0.889***	-0.878***
Asset ownership index (0-15)	-0.0952***	-0.104***	-0.104***
Constant	0.166	0.132	0.123
Observations	2757	2763	2763
Fixed effect	District	District	District

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 18: Relationship between resilience capacity indexes and reducing expenditures (coping strategy)

Dependent Variables (D.V.): Reduce expenditures Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.00655		
Adaptive capacity		0.00451	
Transformative capacity			0.00583**
Shock Severity Index (0-20)	0.0980***	0.0979***	0.0981***
Household demographics (/Percent30+)			
Percent 0-15	0.141	0.141	0.145
Percent 16-30	0.134	0.0694	0.147
Household size	-0.0420**	-0.0445**	-0.0418**
Gender HH type (/Adult Male and Female)			
Adult Female no Adult Male	-0.133	-0.111	-0.122
Adult Male no Adult Female	-0.899**	-0.877**	-0.861**
Women's decision making (0-8)	0.0112	0.00791	0.0113
Project (/SHOUHARDO3)			
Nobojatra	0.0940	0.105	0.102
SAPLING	-0.461*	-0.446*	-0.448*
Asset ownership index (0-15)	-0.0940***	-0.0969***	-0.0752***
Constant	0.344	0.281	0.346
Observations	2757	2763	2763
Fixed effect	District	District	District

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO3) indicate the comparison group.

Table 19: Relationship between resilience capacity indexes and selling assets (coping strategy)

Dependent Variables (D.V.): Sell assets Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.00514		
Adaptive capacity		0.00401	
Transformative capacity			0.00700***
Shock Severity Index (0-20)	0.0587***	0.0583***	0.0581***
Household demographics (/Percent30+)			
Percent 0-15	-0.597***	-0.585***	-0.571***
Percent 16-30	0.000755	-0.0493	0.0261
Household size	0.0288	0.0256	0.0268
Gender HH type (/Adult Male and Female)			
Adult Female no Adult Male	-0.144	-0.128	-0.139
Adult Male no Adult Female	0.387	0.409	0.434
Women's decision making (0-8)	0.0193	0.0158	0.0204
Project (/SHOUHARDO3)			
Nobojatra	-0.0387	-0.0344	-0.0338
SAPLING	-0.331	-0.322	-0.300
Asset ownership index (0-15)	0.0219	0.0174	0.0367**
Constant	-1.470***	-1.528***	-1.484***
Observations	2757	2763	2763
Fixed effect	District	District	District

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO3) indicate the comparison group.

Table 20: Relationship between resilience capacity indexes and migration (coping strategy)

Dependent Variables (D.V.): Migration Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.0104		
Adaptive capacity		0.00351	
Transformative capacity			0.00531**
Shock Severity Index (0-20)	0.0394***	0.0392***	0.0394***
Household demographics (/Percent30+)			
Percent 0-15	0.220	0.232	0.254
Percent 16-30	0.244	0.191	0.266
Household size	-0.0213	-0.0237	-0.0213
Gender HH type (/Adult Male and Female)			
Adult Female no Adult Male	0.259	0.261	0.262
Adult Male no Adult Female	0	0	0
Women's decision making (0-8)	-0.0340	-0.0370	-0.0330
Project (/SHOUHARDO3)			
Nobojatra	-0.295	-0.277	-0.286
SAPLING	-0.996***	-1.005***	-0.989***
Asset ownership index (0-15)	-0.105***	-0.0895**	-0.0723**
Constant	-1.172***	-1.194***	-1.159***
Observations	2626	2632	2632
Fixed effect	District	District	District

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO3) indicate the comparison group.

Table 21: Relationship between resilience capacity indexes and expenditures with interaction terms

Dependent Variables (D.V.): Per capita expenditures OLS estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.0116**		
Shock Severity Index # Absorptive capacity	0.000387		
Adaptive capacity		0.0000657	
Shock Severity Index # Adaptive capacity		-0.0000872	
Transformative capacity			0.000487
Shock Severity Index # Transformative capacity			0.000127
Shock Severity Index (0-20)	-0.00468	0.00717	0.00613
Household demographics (/Percent 30+)			
Percent 0-15	-1.310***	-1.301***	-1.291***
Percent 16-30	-0.459***	-0.441***	-0.479***
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	0.345***	0.326***	0.393***
Adult Male no Adult Female	0.265**	0.271**	0.331***
Women's decision making (0-8)	-0.0578***	-0.0600***	-0.0526***
Project (/SHOUHARDO3)			
Nobo Jatra	-0.247***	-0.327***	0.215
SAPLING	0.458***	0.384***	1.230***
Asset ownership index (0-15)	0.171***	0.221***	0.229***
Constant	1.991***	2.058***	2.126***
Observations	2757	2763	2763
Fixed effect	EA	EA	District
R2	0.476	0.469	0.399

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO3) indicate the comparison group.

Table 22: Relationship between resilience capacity indexes and poverty with interaction terms

Dependent Variables (D.V.): Poverty Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	-0.0368***		
Shock Severity Index # Absorptive capacity	0.000296		
Adaptive capacity		-0.0128**	
Shock Severity Index # Adaptive capacity		0.000337	
Transformative capacity			0.00541
Shock Severity Index # Transformative capacity			-0.000898
Shock Severity Index (0-20)	-0.0143	-0.0242	-0.00390
Household demographics (/Percent 30+)			
Percent 0-15	1.359***	1.326***	1.320***
Percent 16-30	-0.0672	0.111	-0.0891
Household size	0.154***	0.163***	0.156***
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	-0.295	-0.268	-0.227
Adult Male no Adult Female	0.220	0.187	0.234
Women's decision making (0-8)	0.0325	0.0378	0.0330
Project (/SHOUHARDO3)			
Nobo Jatra	-0.0644	-0.119	-0.125
SAPLING	-1.822***	-1.808***	-1.744***
Asset ownership index (0-15)	-0.231***	-0.270***	-0.331***
Constant	-0.469	-0.417	-0.741***
Observations	2757	2763	2763
Fixed effect	District	District	District
R2	N/A	N/A	N/A

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO3) indicate the comparison group.

Table 23: Relationship between resilience capacity indexes and household dietary diversity with interaction terms

Dependent Variables (D.V.): HDDS OLS estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.0399***		
Shock Severity Index # Absorptive capacity	-0.00144		
Adaptive capacity		0.0187***	
Shock Severity Index # Adaptive capacity		-0.000547	
Transformative capacity			0.00634
Shock Severity Index # Transformative capacity			0.000166
Shock Severity Index (0-20)	0.0311	0.0320	0.0131
Household demographics (/Percent 30+)			
Percent 0-15	0.143	0.192	0.247
Percent 16-30	0.191	-0.000196	0.326
Household size	0.0700***	0.0598**	0.0686***
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	-0.150	-0.103	-0.0936
Adult Male no Adult Female	-0.548	-0.508	-0.0371
Women's decision making (0-8)	0.0160	0.00468	0.0338
Project (/SHOUHARDO3)			
Nobo Jatra	-0.151	-0.357***	-0.0905
SAPLING	-0.224***	-0.343***	0.767**
Asset ownership index (0-15)	0.146***	0.156***	0.263***
Constant	4.623***	4.614***	5.505***
Observations	2628	2634	2634
Fixed effect	EA	EA	District
R2	0.333	0.329	0.215

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO3) indicate the comparison group.

Table 24: Relationship between resilience capacity indexes and household hunger with interaction terms

Dependent Variables (D.V.): Moderate to Severe Hunger Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	-0.0235*		
Shock Severity Index # Absorptive capacity	0.0000210		
Adaptive capacity		0.0101	
Shock Severity Index # Adaptive capacity		-0.00151**	
Transformative capacity			0.00271
Shock Severity Index # Transformative capacity			-0.0000416
Shock Severity Index (0-20)	-0.00374	0.0591*	-0.00486
Household demographics (/Percent 30+)			
Percent 0-15	-0.0417	-0.0664	-0.0529
Percent 16-30	-0.107	-0.101	-0.0963
Household size	-0.0227	-0.0207	-0.0202
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	0.219	0.260	0.264
Adult Male no Adult Female	0	0	0
Women's decision making (0-8)	0.0529	0.0559	0.0546
Project (/SHOUHARDO3)			
Nobo Jatra	-0.249	-0.276	-0.294
SAPLING	-0.244	-0.202	-0.227
Asset ownership index (0-15)	-0.0877**	-0.159***	-0.160***
Constant	-0.233	-0.782	-0.366
Observations	2664	2670	2670
Fixed effect	District	District	District
R2	N/A	N/A	N/A

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO3) indicate the comparison group.

Table 25: Relationship between resilience capacity indexes and food consumption with interaction terms

Dependent Variables (D.V.): FCS OLS estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.394***		
Shock Severity Index # Absorptive capacity	0.00426		
Adaptive capacity		0.102	
Shock Severity Index # Adaptive capacity		0.00238	
Transformative capacity			0.00902
Shock Severity Index # Transformative capacity			0.00198
Shock Severity Index (0-20)	-0.135	-0.156	0.0486
Household demographics (/Percent 30+)			
Percent 0-15	-4.580*	-4.142*	-4.551*
Percent 16-30	-0.334	-1.900	-0.446
Household size	1.620***	1.504***	1.521***
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	-0.270	-0.189	-0.129
Adult Male no Adult Female	-1.689	-0.993	2.248
Women's decision making (0-8)	0.610	0.468	0.397
Project (/SHOUHARDO3)			
Nobo Jatra	10.06***	7.735***	-2.893
SAPLING	7.457***	6.024***	4.097
Asset ownership index (0-15)	1.177***	1.874***	2.719***
Constant	31.80***	33.47***	46.96***
Observations	2753	2759	2759
Fixed effect	EA	EA	District
R2	0.328	0.314	0.216

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO3) indicate the comparison group.

Table 26: Relationship between resilience capacity indexes and recovery with interaction terms

Dependent Variables (D.V.): Recovery Probit estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	0.00400		
Shock Severity Index # Absorptive capacity	0.000404		
Adaptive capacity		-0.00737	
Shock Severity Index # Adaptive capacity		0.000461	
Transformative capacity			-0.00948*
Shock Severity Index # Transformative capacity			0.000752
Shock Severity Index (0-20)	-0.120***	-0.133***	-0.117***
Household demographics (/Percent 30+)			
Percent 0-15	0.141	0.155	0.155
Percent 16-30	0.411**	0.493**	0.413**
Household size	0.00686	0.00763	0.00568
Gendered HH type (/Adult Male and Female)			
Adult Female no Adult Male	0.132	0.0964	0.113
Adult Male no Adult Female	-0.247	-0.264	-0.281
Women's decision making (0-8)	0.0267	0.0293	0.0257
Project (/SHOUHARDO3)			
Nobo Jatra	0.942***	0.952***	0.943***
SAPLING	0.251*	0.211	0.234
Asset ownership index (0-15)	0.00329	0.0501*	0.0282
Constant	-1.068***	-0.860**	-1.021***
Observations	2757	2763	2763
Fixed effect	District	District	District
R2	N/A	N/A	N/A

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO3) indicate the comparison group.

Table 27: Relationship between resilience capacity indexes and weight/height z-scores with interaction terms

Dependent Variables (D.V.): Weight/height z-scores OLS estimator	Resilience Capacity Indexes		
	(Absorptive)	(Adaptive)	(Transformative)
Absorptive capacity	-0.00763		
Shock Severity Index # Absorptive capacity	0.00105		
Adaptive capacity		-0.000896	
Shock Severity Index # Adaptive capacity		0.000641	
Transformative capacity			-0.00885
Shock Severity Index # Transformative capacity			0.000368
Shock Severity Index (0-20)	-0.0212	-0.0334	-0.0124
Age in months of child <5yoa	-0.0106***	-0.0108***	-0.0106***
Total # of children <5yoa	-0.0238	-0.0218	0.0662
Household size	0.0415	0.0410	0.0255
Improved water	-0.130	-0.117	-0.0655
Improved sanitation	-0.0847	-0.0699	-0.0924
Children diarrhea	-0.205	-0.210	-0.204**
Gender HH type (/Adult Male and Female)			
Adult Female no Adult Male	0.167	0.187	0.174
Adult Male no Adult Female	-0.0966	-0.0602	-0.331
Women's decision making (0-8)	-0.0322	-0.0375	-0.0149
Project (/SHOUHARDO3)			
Nobojatra	-1.641***	-1.567***	0.343
SAPLING	-2.429***	-2.430***	-0.132
Asset ownership index (0-15)	0.0398	0.0210	0.0325
Constant	1.193***	1.142***	-0.579**
Observations	892	893	893
Fixed effect	EA	EA	District
R2	0.334	0.336	0.118

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 28: Relationship between resilience capacity components and income proxy outcomes

Predictor	Per Capita Expenditures	Poverty
Informal safety nets (0-5)	0.0172	0.0227
Bonding SC (0-170)	0.00883***	-0.0256***
Access to remittances (0-1)	0.316*	-0.499**
Asset ownership index (0-12)	0.202***	-0.297***
Shock preparedness and mitigation index (0-10)	0.0294	-0.0368
Household savings (0-1)	0.0904**	-0.0838
Adult education (0-1)	0.0320	-0.233**
Livelihood Diversity (0-10)	-0.0195	-0.0714**
Adoption of improved ag practices (0-1)	0.0646	-0.124
Access to financial services (0-1)	-0.0396	-0.142*
Formal safety nets (0-2)	-0.0604	0.0340
Access to agriculture extension services (0-1)	0.148**	-0.0161
Shock severity index (0-20)	0.000654	-0.00603
Household demographics (/Percent 30+)		
Percent 0-15	-1.274***	1.328***
Percent 16-30	-0.482***	0.143
Household size	N/A	0.169***
Gendered HH type (/Adult Male and Female)		
Adult Female no Adult Male	0.264**	-0.275
Adult Male no Adult Female	0.265*	0.230
Women's decision making (0-8)	-0.0521**	0.0323
Project (/SHOUHARDO3)		
Nobo Jatra	-0.266***	-0.210
SAPLING	0.438***	-1.847***
Constant	1.939***	0.0109
Estimator	OLS	Probit
Observations	2756	2756
Fixed effect	EA	District
R2	0.488	N/A

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 29: Relationship between resilience capacity components, recovery and food security outcomes

Predictor	Recovery from Shock	Household Hunger	HDSS	FCS
Informal safety nets (0-5)	-0.0867	0.0885	0.0803	0.166
Bonding SC (0-170)	0.00771**	-0.0203***	0.0109***	0.182***
Access to remittances (0-1)	0.155	-0.436	0.247	6.055**
Asset ownership index (0-12)	0.0126	-0.121***	0.194***	2.025***
Shock preparedness and mitigation index (0-10)	-0.0554	0.0578	-0.104	0.414
Household savings (0-1)	-0.00381	0.0156	0.242**	4.278***
Adult education (0-1)	-0.0604	-0.135	0.379***	4.106***
Livelihood Diversity (0-10)	-0.0312	0.0151	0.0545	-0.0315
Adoption of improved ag practices (0-1)	0.161*	-0.401***	0.186*	3.020***
Access to financial services (0-1)	-0.120	-0.143	0.0947	-0.650
Formal safety nets (0-2)	-0.457***	0.260*	-0.00772	-1.396
Access to agriculture extension services (0-1)	0.0728	-0.0340	0.427***	2.112
Shock severity index (0-20)	--	-0.00890	0.000577	-0.0931
Household demographics (/Percent 30+)				
Percent 0-15	0.203	-0.0976	0.192	-3.963
Percent 16-30	0.457**	0.0333	-0.0471	-3.117
Household size	0.00958	-0.0150	0.0561**	1.482***
Gendered HH type (/Adult Male and Female)				
Adult Female no Adult Male	0.0832	0.272	-0.0453	-0.228
Adult Male no Adult Female	-0.329	0	-0.489	-1.131
Women's decision making (0-8)	0.0339	0.0394	0.0163	0.690*
Project (/SHOUHARDO3)				
Nobo Jatra	1.034***	-0.484	-0.303***	9.967***
SAPLING	0.151	-0.0919	-0.156**	8.559***
Constant	-1.127***	0.226	4.313***	27.05***
Estimator	Probit	Probit	OLS	OLS
Observations	2756	2663	2627	2753
Fixed effect	District	District	EA	EA
R2	N/A	N/A	0.349	0.341

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 30: Relationship between resilience capacity components and weight/height z-scores

Predictor	Weight/Height z-score
Informal safety nets (0-5)	-0.146**
Bonding SC (0-170)	-0.0000547
Access to remittances (0-1)	-0.148
Asset ownership index (0-12)	0.0456
Shock preparedness and mitigation index (0-10)	0.0308
Household savings (0-1)	0.0785
Adult education (0-1)	0.103
Livelihood Diversity (0-10)	-0.0118
Adoption of improved ag practices (0-1)	0.00350
Access to financial services (0-1)	-0.0506
Formal safety nets (0-2)	0.0100
Access to agriculture extension services (0-1)	-0.603***
Shock severity index (0-20)	0.00528
Age in months of child <5yoa	-0.0110***
Total # of children <5yoa	0.0237
Household size	0.0432
Improved water	-0.147
Improved sanitation	-0.0508
Children diarrhea	-0.222*
Gendered HH type (/Adult Male and Female)	
Adult Female no Adult Male	0.101
Adult Male no Adult Female	-0.137
Women's decision making (0-8)	-0.0443
Project (/SHOUHARDO3)	
Nobo Jatra	-1.661***
SAPLING	-2.539***
Constant	1.046***
Estimator	OLS
Observations	892
Fixed effect	EA
R2	0.364

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 31: Relationship between resilience capacity components and coping strategies

Predictor	Reduce/Change food consumption	Reduce expenditures	Sell assets	Migrate
Informal safety nets (0-5)	0.399***	0.466***	0.269***	-0.0622
Bonding SC (0-170)	-0.00373	-0.00298	0.00189	0.000249
Access to remittances (0-1)	0.146	0.216	-0.330	0.0700
Asset ownership index (0-12)	-0.0959***	-0.0762***	0.0356*	-0.0711**
Shock preparedness and mitigation index (0-10)	0.337***	0.342***	0.151***	0.286***
Household savings (0-1)	-0.0391	0.117	-0.0581	0.0356
Adult education (0-1)	-0.0103	0.125	0.135	0.135
Livelihood Diversity (0-10)	0.0168	0.00588	0.00680	-0.0182
Adoption of improved ag practices (0-1)	-0.203**	-0.175**	-0.00923	-0.153
Access to financial services (0-1)	0.192**	0.263***	0.136*	0.255**
Formal safety nets (0-2)	0.358***	0.293**	0.141	0.332**
Access to agriculture extension services (0-1)	0.198**	0.0790	0.287***	-0.0574
Shock severity index (0-20)	0.0950***	0.0874***	0.0477***	0.0336***
Household demographics (/Percent 30+)				
Percent 0-15	0.173	0.0310	-0.589***	0.269
Percent 16-30	0.0327	0.0457	-0.0645	0.159
Household size	-0.0198	-0.0448**	0.0207	-0.0270
Gendered HH type (/Adult Male and Female)				
Adult Female no Adult Male	-0.276	-0.0821	0.0126	0.254
Adult Male no Adult Female	-0.672*	-0.815*	0.484	0
Women's decision making (0-8)	-0.00579	0.00657	0.0307	-0.0264
Project (/SHOUHARDO3)				
Nobo Jatra	0.239	-0.00879	-0.0727	-0.334
SAPLING	-0.861***	-0.361	-0.258	-1.080***
Constant	0.176	0.298	-1.655***	-1.228***
Estimator	Probit	Probit	Probit	Probit
Observations	2757	2757	2757	2626
Fixed effect	District	District	District	District
R2	N/A	N/A	N/A	N/A

Note: Equations include community controls (dummies) for unobserved covariates (coefficients are not reported in this table).

Note: Asterisks represent statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) levels.

Note: (/Percent 30+), (/Adult Male and Female), and (/SHOUHARDO) indicate the comparison group.

Table 32: Change in predicted probability table

Predictor Variable	Outcome Variables											
	Poverty		Expend		HDDS		HHS		FCS		Recovery	WHZ
Absorptive capacity	-0.106	***	0.161	***	0.310	***	-0.032	***	4.700	***	0.020	0.011
Adaptive capacity	-0.045	**	-0.007		0.240	***	-0.001		1.992	***	-0.019	0.066
Transformative capacity	0		0		0	***	0		0		0	*
Access to informal safety nets	0.006		0.017		0.080		0.011		0.166		-0.023	-0.146
Bonding social capital	-0.061	***	0.079	***	0.098	***	-0.023	***	1.637	***	0.019	-0.000
Asset ownership index	-0.242	***	0.605	***	0.583	***	-0.0274	***	6.076	***	0.010	* 0.091
Shock prep and mitigation	0		0		0	*	0		0		0	0
Livelihood diversification	-0.018	**	-0.020		0.054	*	0.002		0.032		-0.009	-0.012
Access to formal safety nets	0		0		0		0	*	0		0	0
Access to remittances	-0.116	**	0.316		0.247		-0.041		6.055	**	0.044	-0.148
Household savings	-0.021		0.090	**	0.242	**	0.002		4.278	***	-0.001	0.0785
HH adult education	-0.061	**	0.032		0.379	***	-0.017		4.106	***	-0.017	0.103
Adoption of improved ag practices	-0.032		0.065		0.186	*	-0.053	***	3.020	***	0.043	0.004
Access financial resources	-0.036	*	-0.040		0.095		-0.017		0.650		-0.032	-0.051
Access to ag extension services	-0.004		0.148	**	0.427	***	-0.004		2.112		0.020	-0.603

Note: change in predicted probabilities are computed by taking the difference in probability when moving the explanatory variable from the 25th percentile to 75th percentile, except in the case of binary variables where the difference is computed based on a change from 0 to 1; green highlighted cells are those with strong, statistically significant relationships while yellow highlighted are statistically significant with weaker magnitude effects

Annex C. Multivariate specifications

The principal specification treats resilience capacity, in the face of shocks and stressors, as a key determinant of well-being outcomes. Other determinants, used as controls, include shock exposure, structural household characteristics, and community characteristics (unobservables – EA or district “dummies”)¹⁰:

$$\text{Outcomes} = f \left[\begin{array}{c} \textbf{Shock exposure} \\ \\ \textbf{Household resilience capacities} \\ \textit{(assets, human capital, bonding social capital,} \\ \textit{number of livelihoods)} \\ \\ \textbf{Community resilience capacities} \\ \textit{(public services, safety nets)} \\ \\ \textbf{Household characteristics} \\ \textit{(gendered household type, size of household, wealth,} \\ \textit{household demographics)} \\ \\ \textbf{Community characteristics} \end{array} \right]$$

Household and community resilience are included in regression equations as the primary explanatory variables of interest both in their index form (i.e., absorptive capacity index, adaptive capacity index, and transformative capacity index) and decomposed into components (i.e., bonding social capital, human capital, access to financial services, etc.).

Next, resilience capacities are treated as determinants of shock coping strategies. A general hypothesis is that absorptive, adaptive, and transformative capacities influence households to adopt coping strategies that promote better recovery and other well-being outcomes.

¹⁰ Sometimes referred to as “fixed-effects”; however, to be clear, this analysis is cross-sectional in nature (i.e., not a panel).

$$\text{Shock coping strategies} = f \left[\begin{array}{l} \text{Shock exposure} \\ \text{Household resilience capacities} \\ \quad (\text{absorptive, adaptive}) \\ \text{Community resilience capacities} \\ \quad (\text{transformative}) \\ \text{Household characteristics} \\ \quad (\text{gendered household type, size of household, wealth,} \\ \quad \text{household demographics}) \\ \text{Community characteristics} \end{array} \right]$$

Annex D: Additional Descriptive, Resilience Capacities

Table 33: Values of resilience capacities and components at 25th and 75th percentiles

	25 th percentile	75 th percentile
Absorptive capacity index	10.39	22.05
Adaptive capacity index	36.15	55.02
Transformative capacity index	0	0
Access to informal safety nets (mean, 0-5)	0	1
Bonding social capital (mean, 0-170)	6	15
% HH with access to remittances	0	0
Asset ownership index (mean, 0-18)	2	5
Shock preparedness and mitigation (mean, 0-10)	0	0
% HH with savings	0	0
% HH with adult education	1	1
Livelihood diversity (mean, 0-12)	2	3
% HH adopting improved ag practices	0	1
% HH with access to financial resources	0	1
Access to formal safety nets (mean, 0-2)	0	0
% HH with access to ag extension services	0	0

*Values predicted at 0 and 1 because the measure is binary.