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From women's empowerment to food security: Revisiting global discourses through a cross-country analysis

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From women's empowerment to food security: Revisiting global discourses through a cross-country analysis

Abstract

Global discourses have advocated women's empowerment as a means to enhance food security. Our objective was to critically review the causal linkages between women's empowerment and food availability and access. We relied on mixed methods and a cross-country analysis, using household survey data from Bangladesh, Nepal and Tajikistan and qualitative data from Nepal. The quantitative analysis highlights the diversity of patterns linking empowerment and food security indicators and the roles socio-economic determinants play in shaping these patterns across countries. The qualitative analysis further stresses the need for a truly intersectional approach in food security programmes that supports challenging the structural barriers that keep marginalised men and women food insecure. Lastly, our findings call for informing standardised measures of empowerment with an assessment of local meanings and values.

Keywords: food security; women's empowerment; gender; intersectionality; multi-country analysis; mixed-methods study

1. Introduction

Global food security debates have framed gender equality as an effective tool to support agricultural and economic growth and enhance food security (ADB, 2013; Duflo, 2012) – a narrative that particularly resonates with increasing patterns of male out-migration and the so-called ‘feminisation of agriculture’. Many studies have evidenced strong linkages between gender inequality and food insecurity, notably in the case of poor and marginalised women who have less access than men to critical resources for agricultural livelihoods (Quisumbing and Pandolfelli, 2010) or in respect to how women’s disempowerment affects maternal and child nutrition (Malapit et al., 2015a; Malapit and Quisumbing, 2015; Nisbett et al., in press; Sraboni et al., 2014).

Food security discourses envision that if women have similar access to productive resources as men, agricultural productivity will increase, thereby contributing to enhanced food security, e.g. *“Increasing women’s access to land, livestock, education, financial services, extension, technology and rural employment would boost their productivity and generate gains in terms of agricultural production, food security, economic growth and social welfare”* (FAO, 2011).

Some would argue that this instrumental narrative represents a strategic and necessary step to attract the attention of international development agencies and policy-makers to gender inequalities in agriculture globally. Indeed it has to some extent contributed to the inclusion of women’s empowerment components in food security programmes, deploying interventions that have specifically targeted women. It has also been visible in the monitoring and evaluation of these programmes, and in particular in the development and implementation of the Women’s Empowerment in Agriculture Index (WEAI), a tool designed to measure the impact of USAID programmes under the Feed the Future initiative (Alkire et al., 2013).

25 Yet the operationalization of this narrative linking women's empowerment through access to
26 productive resources to increased food security has so far largely failed to deliver on its
27 promises, both in terms of actual investments dedicated to women's empowerment, and
28 resulting outcomes on gender equality and enhanced food security (Galie and Kantor, 2016).
29 Some scholars remark that such policy discourse promotes a narrow and apolitical vision of
30 women's empowerment (Galie and Kantor, 2016), which is symptomatic of development
31 programmes in general. The latter have often focused on economic empowerment without
32 necessarily addressing the norms, institutions and broader political economic structures that
33 (re)produce gender inequalities in the first place (Batliwala and Dhanraj, 2004; Cornwall and
34 Edwards, 2010; Kabeer, 2005; O'Laughlin, 2007). Stevano (2017) also points to the structural
35 gendered forms of deprivation that generate food insecurity such as lack of secure
36 employment and conflicting labour demands.

37 Our study aims at bringing fresh insights on the relationships between women's
38 empowerment and food security through an intersectional perspective and a mixed methods
39 approach across multiple countries. Intersectionality refers to "*the ways in which forms of*
40 *social difference (race, class, gender, disability, among identities) 'add up' to circumscribe*
41 *how people see themselves and how they are seen in the social milieu, leading to various*
42 *forms of discrimination or privilege*" (Butler, 1997 in Nightingale, 2015). We first explored
43 women's empowerment and food security relationships relying on quantitative data from
44 three household surveys conducted in Bangladesh, Nepal and Tajikistan. We then critically
45 reflect on the findings of our statistical analysis, based on qualitative data collected in two
46 communities in Nepal. The communities were selected from project interventions under the
47 same development project and region as where the household survey was conducted, in order
48 to link the qualitative data analysis to the quantitative data analysis.

49 **2. Conceptual framework**

50 We largely draw on Kabeer's empowerment framework (1999) for our analysis. Kabeer
51 (1999) defines power as one's ability to make choices and distinguishes three inter-related
52 dimensions to the process of empowerment: resources (material and non-material, i.e. human
53 and social), agency and achievements. Agency does not only encompass observable actions
54 but also the motivation for these actions and the meanings given to them. We also include
55 under agency one's ability to influence through positions and identities. For instance, in some
56 societies, the elder man can influence the actions or behaviours of his family members solely
57 by his mere position and identity, without any verbal actions or decisions.

58 We also reckon that power does not necessarily lie in individuals but is also pervasive in the
59 form of what Bourdieu coined 'doxa' (1977 in Kabeer, 1999) or the latent form of power
60 (Lukes, 2005) that ensures acceptance of domination: what appears normal and natural is not
61 contested or even perceived unfair. This pervasive form of power was particularly evidenced
62 in Foucault's writings on how power is embedded in daily practices, institutions and
63 discourses (e.g. Foucault, 1975). In feminist studies, this is what Rowlands (1998) refers to as
64 'internalised oppression' whereby power is exercised through the mere acceptance of
65 dominant norms, rules, relationships and the development of a belief that these are normal,
66 just and legitimate. This leads us to add the concept of 'critical consciousness', developed by
67 Freire (1970) to the three other dimensions of empowerment, as proposed earlier by other
68 gender and development scholars (Cornwall, 2016; Cornwall and Gaventa, 2001; Goldman
69 and Little, 2015; Leder, 2016). Critical consciousness denotes one's ability to realize and
70 react on the structures and other forms of power that produce inequalities and exclusion. In
71 this perspective, reflective argumentation skills are a pre-condition for transformative change
72 and sustainable development (Leder, 2018).

73 To define food security, we rely on the FAO definition: « *Food security, at the individual,*
74 *household, national, regional and global levels [is achieved] when all people, at all times,*
75 *have physical and economic access to sufficient, safe and nutritious food to meet their dietary*
76 *needs and food preferences for an active and healthy life* » (FAO, 1996). We distinguish
77 between food insecurity as a state and as a process (as Kabeer proposes for poverty, see
78 Kabeer, 2015). Food insecurity as a state is what is observed at a given point in time, whereas
79 food insecurity as a process reflects the mechanisms and structural causes that create food
80 insecurity. We expect that food insecurity as a state affects and is perceived by men and
81 women differently (Coates et al., 2010) while food insecurity as a process is created through
82 distributive and procedural mechanisms that exclude men and women differently.

83 In our quantitative analysis, we particularly examine the linkages between agency and
84 achievements, as it has been, until recently, relatively less studied than the relationship
85 between resources and achievements in the gender and food security literature. Food security
86 is the broad achievement considered here, but we mostly considered food availability and, to
87 some extent, food access, among the four following elements of food security: availability;
88 access; safety, nutrition and sanitation; stability and environment. Following the entitlement
89 approach, we recognise the various mechanisms which people draw upon to acquire food, as
90 well as their ability to draw on multiple mechanisms and diversify risk, understood as
91 ‘capabilities’ (Sen, 1981). A central assumption in our approach is to posit that these
92 capabilities are shaped not only by gender but also by other social markers and identities, such
93 as age, caste, class, ethnicity, religion etc. These do not simply ‘add up’ to each other but
94 intersect to form new forms of vulnerability to food insecurity. Empowerment is a key
95 process that allows entitlements to be realised, secured or claimed (Drèze and Sen, 1989). In a
96 food sovereignty perspective, empowerment is also critical for smallholder farmers to gain the

97 right to control over food production and define their own food and agriculture policy (Patel,
98 2012).

99 **3. Data and methodology**

100 **3.1 Quantitative data collection and analysis**

101 We used the quantitative data collected through a household survey across three different
102 projects conducted in Bangladesh, Nepal and Tajikistan. In the case of Nepal, the survey was
103 designed by the research team for the purpose of the impact evaluation of a development
104 project implemented by an international non-governmental organisation (INGO). The surveys
105 for these three projects did not specifically aim at exploring relationships between food
106 security and women's empowerment but collected data on agricultural practices, water
107 management and on different components of food security and women's
108 empowerment/agency (Table 1). We therefore used a heterogeneous set of variables as
109 indicators of women's empowerment and food security. Our intention was not to compare
110 results across countries but rather to explore different types of relationships between
111 empowerment and food security across a wide range of contexts.

112 In the case of Bangladesh and Tajikistan, the variables considered for women's empowerment
113 are largely related to agency in the form of decision-making. For Nepal, we used the
114 indicators of a more elaborate index, drawing on the WEAI developed by IFPRI and OPHI
115 (Alkire et al., 2013). The WEAI is an aggregate index based on individual level data on men
116 and women within the same households. The WEAI comprises of two sub-indexes: 1) the five
117 domains of empowerment (5DE); and 2) the gender parity index (GPI). The 5DE sub-index
118 attempts to assess the roles of women in agriculture as well as their level of engagement in
119 this sector to reflect their status of empowerment in five domains of empowerment: (1)

120 decisions over agricultural production, (2) access to and decision-making power over
121 productive resources, (3) control over use of income, (4) leadership in the community, and (5)
122 time use (Alkire et al., 2013). We used the Abbreviated WEAI (A-WEAI) for the purpose of
123 the project impact evaluation. The A-WEAI was developed as a shorter and streamlined
124 version of the WEAI and includes six indicators under the 5DE: inputs in productive
125 decisions, ownership of assets, access to and decisions on credit, control over use of income,
126 group membership and workload. We used for our analysis, the indicator variables for
127 whether the primary female in the household is empowered (binary) (Malapit et al., 2015b),
128 as we felt that considering different domains of empowerment would allow a more nuanced
129 analysis than if we used the aggregate A-WEAI scores.

130 For food security, we relied on a mix of indicators related to self-consumption strategies,
131 likelihood of facing a food shortage, coping strategies in case of food shortage and
132 malnutrition anthropometric indicators (wasting, stunting and under-weight for children under
133 two years old) (Table 1). These are broadly related to food availability, food access and actual
134 undernutrition.

135 To quantify the correlation between the women's empowerment variables and the food
136 security indicators, we used multivariate regressions to control for household-level attributes
137 that may conjointly affect the food consumption behaviour, food shortages as well as the
138 choice of a coping strategy. Ordinary Least Square regressions are used when the dependant
139 variable is continuous. In the case of binary dependant variables, Logit regressions were
140 preferred and marginal effects reported. Finally, for censored dependant variables, as the
141 number of months, results from Tobit regression are presented. All tables and figures
142 showing the results from the quantitative analysis are provided in the Appendix.

143 In the same time, we explored to which extent our indicators of women's empowerment and
144 food security were associated with household-level socio-economic indicators. We used three

145 types of socio-economic indicators: wealth, class (land ownership), female-headed household
146 and we added one indicator related to caste and ethnicity for Nepal. Poverty has been found to
147 aggravate gender inequalities, notably in terms of nutrition in Bangladesh (Kabeer, 2015;
148 Sraboni et al., 2014). Land ownership is a strong determinant of both wealth and food security
149 in the South Asian context particularly – it was not included in the analysis for Tajikistan,
150 where land is less a limiting factor for food security. Female headship is also a recurrent
151 indicator of how gender inequalities intersect with poverty across countries (Kabeer, 2015)
152 and with food security (ADB, 2013). In the case of Nepal, Dalit women (Dalits are former
153 untouchables and lowest in the social hierarchy) are particularly vulnerable to poverty and
154 food insecurity (UNDP, 2014), as they face double discrimination and marginalisation
155 (Bennett, 2008). Similarly Janajati, who include diverse indigenous groups in the hills and
156 Terai-Madhesh region of Nepal, have historically suffered from socio-economic and political
157 exclusion and marginalisation.
158

159 *Table 1. Background and characteristics of the quantitative data collection and analysis*

	Bangladesh	Nepal	Tajikistan
Name of project	Aquatic Agricultural System CGIAR Research programme “Community water management from a micro level perspective”	Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED) - Anukulan	“Impact of Water Users Associations on Water and Land Productivity, Equity and Food Security in Tajikistan”
Type of survey	Project baseline household survey	Project baseline household survey	Project household survey
Districts/ Region	Khulna Hub (Polder 3, 30, 29, 43/2f). The Unions included were Noapara, Tarali, Gangarampur, Batiaghata, Sarappur, Sahas.	Bardiya, Dadeldhura, Doti, Kailali, Kanchanpur and Surkhet	Khatlon Region † (116 <i>jamoats</i> selected), Sughd Region (21 <i>jamoats</i> selected) and districts of Republic Subordination Region (27 <i>jamoats</i> selected)
Survey date	August 2015	January 2016	March 2016
Sample size	672 households	600 households	1920 households
Sex of the respondent	Household head. Majority of the respondent (86.8%) were male.	Adult main male and female decision-makers for the A-WEAI indicators Household head for the data on food security and household characteristics	Adult female
Sampling methodology for households	30 households randomly selected and surveyed in each village across 24 marginalised villages	600 households from 20 VDCs (10 treated VDCs and 10 non-treated VDCS).	From 164 <i>jamoats</i> irrigated by gravity irrigation schemes, 80 were randomly chosen; 2 villages were randomly

selected from each *jamoat* (160 villages in total); in each of the selected villages, 12 households were randomly selected from a list of households.

Variables considered for women's empowerment	Sex of the person who is making the following decisions: <ul style="list-style-type: none"> • <i>Women decide on the use of agricultural products</i> * (vegetables, other crops, livestock/poultry) • <i>Women decide on the use of agricultural incomes</i>* 	6 indicators of empowerment from the 5DE (A-WEAI): <ul style="list-style-type: none"> • <i>Input in productive decisions</i>*, • <i>Ownership of agricultural assets</i> * • <i>Control over the income from agriculture</i>*, • <i>Access to and decisions about credit</i>*, • <i>Group membership</i>*, and • <i>Workload</i>* 	<i>Women decide on use of agricultural produce</i> *: Sex of the individual who usually makes decisions on retaining produce for household consumption
Variables considered for food security	<i>Access to food</i> <ul style="list-style-type: none"> • Number of months with food shortage • Number of months with acute food shortage • At least one month of food shortage* 	<i>Access to food</i> <ul style="list-style-type: none"> • Overall crop productivity (rice and wheat) <i>Self-consumption</i> <ul style="list-style-type: none"> • Share of harvest kept 	<i>Self-consumption</i> <ul style="list-style-type: none"> • Share of harvest of maize, capsicum, cucumber, eggplant, tomato, onion, potato kept for household consumption

	<p><i>Self-consumption</i></p> <ul style="list-style-type: none"> • Share of <i>aman</i> rice, vegetables, aquaculture/fish kept for self-consumption 	<p>for self-consumption for cereals (rice and wheat) and vegetables</p>	<p><i>Coping strategies</i></p> <p>Household adopts/does not adopt the following strategy:</p> <ul style="list-style-type: none"> • Rely on cheap, less expensive and less preferable food* • Reduce the quantity of intake of food in each meal * • Reduce the number of times food is eaten per day* • Spend days without eating any food* • Borrow from relatives/friends for food* • Purchased food on credit* • Borrow from relatives/friends for food* • Purchased food on credit* • Ate crop seed that was stored for cultivation* • Sold household items to purchase food*
	<p><i>Coping strategies</i></p> <ul style="list-style-type: none"> • Rely on cheap, less expensive and less preferable food* • Reduce the quantity of intake of food* • Spend days without eating any food* • Borrow from relatives/friends for food* • Purchased food on credit* • Eat stored seeds* • Sell household goods for money* 	<p><i>Undernutrition</i></p> <ul style="list-style-type: none"> • Under 2 children suffering from stunting* (HAZ<-2) • Under 2 children suffering from wasting* (WAZ<-2) • Under 2 children suffering from underweight* (WHZ<-2) 	
Socio-economic household-level variables considered	<ul style="list-style-type: none"> • Household wealth index** • Area of owned land • Female-headed household* (the main decision-maker of the household is female) 	<ul style="list-style-type: none"> • Area of owned land • Female-headed household*(the main decision- 	<ul style="list-style-type: none"> • Dummies for source of domestic water: • Presence of piped water in the house*, or household fetches

for this analysis	<ul style="list-style-type: none"> • Age of the head of household 	maker of the household is female)	water from a public tap* (with drawing water from canals as the default)
	<ul style="list-style-type: none"> • Religion* (Hindu or not) 	<ul style="list-style-type: none"> • Age of the head of household • Number of household members • Caste* (Dalit or not) • Ethnicity* (Janajati or not) • Income received from remittances* (proxy of migration status) 	<ul style="list-style-type: none"> • Gas or electric stove used for cooking* • Dwelling has wood flooring* • The household has at least one member migrated* • Highest education attainment: at least high school* • At least one household member has vocational training*

160 †Tajikistan is divided into four regions, and the capital city of Dushanbe. The regions are Sughd, Districts of
161 Republican Subordination, Khatlon, and Gorno-Badakhshan Autonomous. Each region is divided into districts,
162 and each district into *jamoats*, which are the lowest administrative units.

163 * Binary variables

164 ** The household wealth index was built using a principal component analysis with indicators of asset
165 ownership, type of house and electricity access.

166 The characteristics of the households sampled are presented in Table 2.

167

168 *Table 2. Socio-economic characteristics of surveyed households*

Population characteristics	Bangladesh	Nepal	Tajikistan
Average household size	5.2	5.7	4.8
Proportion of female-headed households (%)	13	35	14
Average age of household head	46	42	53
Religion, caste and ethnicity (% distribution)			
Dalit and marginalised groups		16.6	-
Janajati		40.9	
Hindu	61.5	-	-
Muslim	37.9	-	-
Vegetable cultivation			
Proportion of households cultivating vegetable on homestead land (%)	55	-	75
Agricultural land holding			
Households owning agricultural land (%)	100	97	99
Average size of agricultural land (ha)	0.51	0.37	12.65
Percentage of holdings operating less than 0.5 ha	64.7	74.0	0.0

169

170 In Bangladesh, households rely on both farming and aquaculture. Rice is the staple crop
 171 whereas households also grow vegetables in the homestead garden. In Nepal, households
 172 cultivate rice or rice and wheat depending on the location, whereas women often cultivate
 173 vegetables in home gardens, primarily for home consumption. The surplus sold on the market
 174 provides them a small income, which is usually used for school fees or petty household
 175 expenses (Clement and Karki, 2018). As visible in the proportion of female-headed
 176 households, migration is an important risk diversification strategy in Nepal, with the hope to
 177 reduce food insecurity through sending remittance that enable other members of the
 178 household to obtain food. In Tajikistan, home gardens are an important production system for

179 the household. Earlier, they were used to cultivate vegetables and fruits to augment the
180 family's diet but recently they have also emerged as a source of cash income through sale of
181 surplus.

182 **3.2 Qualitative data collection and analysis**

183 The qualitative component of our study considers food insecurity as a process, exploring
184 some of the structural causes that create food insecurity.

185 In Nepal, the qualitative study was conducted between November 2015 and May 2016 as part
186 of the BRACED project under which also the quantitative data were collected. We selected
187 two communities in Dadeldhura and Doti districts, based on the diversity of caste and ethnic
188 groups among the beneficiaries and different types of interventions conducted.

189 The INGO envisioned in this project multiple pathways linking women's empowerment and
190 increased food security: women's enhanced access to water for both domestic and productive
191 uses and women's membership in vegetable farming groups would allow them engaging in
192 irrigated homestead vegetable gardening. Vegetable production would in turn contribute to a
193 more diverse diet and enhanced maternal and child nutrition, while the sale of vegetable
194 products would increase household income and thus its resilience to external climatic shocks.

195 The objective of our study was to capture local meanings of empowerment and understand the
196 causal processes and mechanisms that link women's empowerment in agriculture to
197 household food security and resilience to shocks.

198 The research team started with a transect walk, village resource mapping and a participatory
199 power ranking to understand social hierarchies and differentiated access to natural resources
200 in the community. Then, 5-6 key informant interviews were conducted in each community
201 and several focus group discussions (FGDs) disaggregated by sex and household power
202 category on empowerment. Eight women were selected based on their household power
203 category covering high, middle and low power categories, to conduct and discuss power-self

204 rankings and jointly reflect on their own A-WEAI score. Lastly in-depth interviews were
205 conducted with 12-15 women in each community to explore life histories, household
206 livelihood strategies, project implementation outcomes, access to drinking water and
207 irrigation facilities, group membership and access to credit, and involvement in household and
208 community-level decision-making.

209 **4. Results**

210 **4.1 Relationships between indicators of women's empowerment and food security**

211 *4.1.1. Self-consumption*

212 In Bangladesh, results indicate that women's decision on how the agricultural production
213 should be used (sold, self-consumed or stored) significantly determine the share of the
214 vegetable harvest retained for self-consumption. However, their decision is not a determinant
215 of the share of aman rice and fish kept for self-consumption (Table B1). This is in line with
216 earlier research findings on women's role to ensure household food security in Bangladesh
217 (Sraboni et al. 2014) and traditional gendered division of family labour, with women having
218 more labour input and control over homestead vegetable gardening and men more control
219 over rice production, fishing and marketing of these products (Rahman, 2000; Sultana and
220 Thompson, 2008).

221 In Nepal, results are mixed: when women are empowered in terms of access to and decisions
222 about credit, a significantly larger share of both vegetable and cereal production is kept for
223 home consumption (with cereal production and marketing usually under the male domain).
224 The relationship is the opposite for vegetable production when women were empowered in
225 terms of control over the income (Table N1). This could be explained by the fact that
226 homestead vegetable production and sales are often a significant – or the only – component of

227 rural women's income in the sampled region – so the direction of the relationship might
228 therefore be opposite than the one expected: when women sell a larger share of vegetables,
229 they have more control over income.

230 In Tajikistan, women's decision-making only had a significant effect on the amount retained
231 in the case of maize, which is used both for animal and human consumption: when women
232 decide on the use of maize product, slightly less of the harvest is retained for home
233 consumption (Table T1).

234 *4.1.2 Access to food*

235 In Bangladesh, decisions by women on the use of the agricultural produce and the use of the
236 incomes from crop sales are significantly associated with a reduction of the number of months
237 faced with food shortage, with acute food shortage and even the likelihood to face a food
238 shortage (Table B2). Interestingly, the coefficients are higher for the decision on the incomes
239 than for the decision on the produce.

240 In Nepal, we use information on crop productivity as a proxy of food availability. The
241 relationship between women's decisions over income and wheat productivity is positive
242 (Table N2). However the access to and decision about credit is negatively associated with
243 wheat productivity. The relationship between women's empowerment and food availability
244 and its direction is therefore unclear – but in line with earlier results on self-consumption.
245 Women's empowerment over credit is both significantly correlated with lower wheat
246 productivity and a greater share of cereals kept for self-consumption.

247 *4.1.3. Coping strategies*

248 In Bangladesh, when women primarily take decisions on the use of agricultural produce, the
249 likelihood to rely on cheap food is reduced by 8%, all things being equal and compared with
250 other households. Similarly, the likelihood to eat stored seeds is reduced by 2% with women
251 deciding the allocation of agricultural produce. The decision of women on the incomes from

252 agriculture also reduce the probability of using a coping strategy, namely the use of cheap
253 food (minus 19%), the reduction of food quantity (minus 11%) and the use of credit for
254 purchasing food (minus 10%) (Table B3), results which are in line with the relationship with
255 reduced food shortage.

256 Results are opposite in Tajikistan. In households where women are primarily responsible to
257 determine the use of vegetables through the year, those households are likelier than others to
258 rely on food shortage coping strategies that smoothen out the fall in consumption, such as
259 relying on cheaper food (16% more likely), reducing the quantity of food intake in each meal
260 during food shortfalls (12% more likely), or purchasing food on credit (8% more likely)
261 (Table T2).

262 *4.1.4. Undernutrition*

263 In the case of Nepal, anthropometric measures have been collected for children under two
264 years old. The access to and decisions about credit for women significantly reduce the
265 likelihood for the children of the household to face stunting and underweight (Table N3).

266 To sum-up, our results suggest mixed and unexpected findings on the relationship between
267 women's agency and food availability and access. The relationship varies in terms of type of
268 agricultural product considered, type of decisions taken, type of indicator of empowerment,
269 and across the three countries. To further our analysis, we explored how the relationships
270 between women's empowerment and food security depend on socio-economic indicators
271 across the three study countries. We therefore unpack 'women' as a category to explore how
272 different types of social markers and identities affect how agency translates into
273 achievements.

274 **4.2 Unpacking the category of rural women farmers**

275 *4.2.1 Wealth and class*

276 In Bangladesh, wealth is negatively and significantly associated with food shortage and use of
277 almost all coping strategies. As expected, wealthier households are less likely to be food
278 insecure and to rely on food coping strategies (Tables B2 and B3). Wealth is not significantly
279 associated with the share of agricultural products kept for home consumption, whereas in
280 Nepal, households from higher class (reflected in terms of area of owned land) keep a lower
281 share of cereals for self-consumption (Table N1), which is in line with expectations.
282 However, in Tajikistan, female decision-makers from wealthier households¹ are 16% more
283 likely to purchase food on credit and 20% more likely to borrow money from friends than
284 other decision-makers (Table T2). The set of coping strategies adopted by wealthy female
285 decision-makers thus partly differs from that of other decision-makers as a whole, who are
286 more likely to eat cheap food, reduce food quantity and purchase food on credit. This suggests
287 that wealth influences the set of coping strategies available to or/and adopted by women.

288 *4.2.2. Female-headed households*

289 In Bangladesh, female-headed households are found to be more likely to face food shortage
290 (Table B2), which could be explained that, in the context of Bangladesh, these households are
291 poorer (Kabeer, 2015) and, we suspect, might have more limited social networks, less access
292 to information and might face greater exclusion from the provision of public services. We
293 also found a significant and positive effect of female-headed households on the likelihood to
294 rely on cheap food (Table B3). In Nepal, women from female-headed households reported
295 keeping a larger share of their cereal harvest for self-consumption instead of selling (Table
296 N1), but we did not observe any effect on crop yields and child nutrition (Tables N2 and N3).
297 In Tajikistan, females who make decisions in households with male migrants² are 14% less
298 likely to switch to cheap food and 9% less likely to reduce quantity of food consumed (Table

¹ The product of a dummy variable that takes a value of 1 when the sex of the decision maker is female and a dummy variable that denotes that presence/absence of piped water in the household

² Product of a dummy variable that takes a value of 1 when the sex of the decision maker is female and a dummy variable that denotes the presence/absence of male migrants in the household

299 T2, which in this case suggests that women use remittances to reduce food insecurity in the
300 household.

301 *4.2.3. Caste and ethnicity*

302 In Nepal, the effect of Dalit caste is not significant on any of our food security indicators,
303 which is at first glance surprising as Dalits are still among the poorest in Nepal (UNDP,
304 2014). This might be because a high proportion of Dalits is still landless (NSIS, 2012), hence
305 we cannot find any direct linear relationship between caste and agricultural productivity
306 indicators. Janajati households retain a larger share of vegetable for their own consumption
307 (Table N1) and they also achieve higher productivity of rice and wheat, all things being equal.
308 (Table N2). This is also unexpected, but might due to the high proportion in our sample of
309 Janajatis living in Terai Madesh, a region characterised by higher landholdings and crop
310 productivity than the hill districts surveyed.

311 **4.3 Understanding the complexity of empowerment/food security relationships**

312 We now turn to our qualitative data from two communities in Western Nepal to delve into the
313 complexity that characterises the relationships between women's agency and food availability
314 and access. Our findings evidence new variables and processes that were not captured by the
315 quantitative analysis, notably related to empowerment. We first examine agency at the intra-
316 household level, in the particular situation of women with migrated husbands. Then, we
317 broaden our analysis to consider how social relationships beyond the household shape access
318 to productive resources and agency.

319 *4.3.1. Intra-household agency*

320 Nepal has seen an increase in long-term male out-migration to India, Malaysia and Gulf
321 countries, which has affected the distribution of gender roles, responsibilities and resources
322 (Leder et al., 2017; Sugden et al., 2014). In this context, we found that high levels of women's
323 agency, as assessed with the A-WEAI, do not necessarily translate into a feeling of

324 empowerment ('shashaktikaran' in Nepali) and in increased food security. In contrast, several
325 women with permanently out-migrated husbands, who were rated "empowered" according to
326 their A-WEAI scores, were rated by other women and self-rated themselves as the least
327 empowered and marginalised in their community.

328 For example, for one of our respondents, Kamala, the A-WEAI indicators indicated that she is
329 empowered in decision-making, based on her position as household head without the presence
330 of in-laws or her husband. However, she stated to feel lonely and worried about her ability to
331 provide quality education and adequate medical care for her son and pay back multiple loans.
332 As phone calls to her husband abroad are expensive, communication and mental support from
333 him are very limited, and her maternal family lives far away. In fact, in FGDs, women
334 identified kins' mental, financial and labor support as a contributing factor to their feeling of
335 empowerment. Conversely, they perceived support to others as a key achievement of
336 empowered women including the ability to help other women in cultivating crops and
337 vegetables: "They [empowered women] can tell us what to grow and how much to plant".

338 Another woman, Sunita, resides with her three young children while her husband works in
339 Malaysia. She makes minor household decisions, decides on agricultural production and is an
340 active member of savings groups. However, when asked to describe her life, Sunita described
341 her life full of '*dukkha*' ('sadness' in Nepali). Her husband's passport was taken away,
342 making him unsure of how to return home and he has only managed to send her NPR 20,000
343 (USD 200) in the last three years, a small amount considering he took a loan of NPR 160,000
344 (USD 1,600) to get to Malaysia. When harvest fails due to drought, she works as daily wage
345 labourer, carrying construction material for 200 NPR (1.7 USD) a day, as a coping strategy to
346 be able to purchase food.

347 These two particular life stories illustrate how increased control over decision-making within
348 the household does not necessarily match with women's own perceptions of their
349 empowerment. We encountered many women who did not feel empowered by taking
350 decisions while their husband is away. Rather they felt powerless in the face of challenges
351 related to exploitative credit system, social norms, masculine bureaucracies, or double
352 standards to access public services. Yet they did not necessarily see empowerment as
353 challenging the oppressive structures and relationships that shape their lives, but rather
354 prioritized household food security and family harmony. As a daughter-in-law indicated when
355 she shared her life history: "They [in-laws] will tell me what to grow, where to grow. I don't
356 feel like saying anything. They tell me what to do. I don't feel bad about it. That is fine. They
357 know better." (T_I7). This is in line with Bourdieu's notion of 'doxa' – gender and age
358 inequalities within the household are culturally desired and not questioned. In contrast,
359 several other daughter-in-laws mentioned they advise their in-laws, while at the same time
360 being critically conscious of the necessity to respect their elders. This intermediate form of
361 awareness and agency may open up spaces to bring about social change.

362 *4.3.2. Looking beyond the household: caste and class*

363 In Nepal, Dalits usually reside at the fringe or outside the main settlement, with limited access
364 to land, social networks and information. They lack access to water resources due to religious
365 norms and structural constraints (Nightingale, 2011). In mixed caste communities, existing
366 inequalities in water access have often been reproduced through external water and food
367 security project interventions as local power relationships largely shape their implementation
368 (Clement et al., 2014; Leder et al., 2017).

369 In one of the researched communities in Nepal, the project staff invited all women and men
370 from the communities to participate in meetings to decide on the location of taps before a
371 multiple-use water system (MUS) was built. However, the Dalits, who represent 15% of the

372 population, perceive that the distribution has not been fair as only one of the 22 water taps
373 was installed in their settlement. One contributing factor was the limited ability of Dalit
374 women to influence decisions due to the dominance of higher caste men during the meetings.
375 In addition, their landlessness or almost landlessness was stated as an important hindering
376 factor to receive a tap, as the BRACED project targeted households who could use the water
377 to grow vegetables in their home garden. Dalits were not only excluded but also negatively
378 affected by the project intervention. While higher caste households benefited from greater
379 access to water taps, women of these households would less frequently go to the old
380 communal water taps and natural water sources. Because Dalit women have to rely on other
381 women to fill their vessel, as touching water is culturally not allowed for them, they now have
382 to wait longer times to get water.

383 The way caste, class and inter-household relations intersect to shape food security became
384 very apparent in the case of one landless Dalit research participant, Maya. Maya lives with
385 her two daughters, and her out-migrated husband in Malaysia has neither sent remittances nor
386 news. Maya is the one who makes decisions at home, however, as an agricultural wage
387 laborer, she is dependent on landowners for her household food security, and in particular on
388 an elderly high caste Chhetri “mother”, who took her under her care and allows her to stay
389 next to her house in exchange of free agricultural and domestic labor. Thanks to her close
390 relation to this Chhetri woman, she developed both as an outspoken leader among the Dalits,
391 but also as a critically scrutinized woman in the village. Her privileged geographical location
392 also makes her less prone to food shortages than other Dalits, who live closer to the mountain
393 stream and are more exposed to monsoonal floods and landslides. . Her multiple gendered and
394 caste subjectivities demonstrates how leadership is complicated and shifting over social
395 spaces: as a Dalit, she belongs to the most marginalized group within the community,
396 considered impure in the Hindu caste system. Nevertheless, she is much more privileged than

397 other Dalits due to her social relation to a Chhetri and a privileged geographical location as
398 she is less prone to food shortages than other Dalits, who live closer to the mountain stream
399 and are more exposed to monsoonal floods and landslides.

400 **5. Discussion and conclusion**

401 Reflecting on our findings in light of our framework constituted by resources, agency,
402 achievements and critical consciousness, a few interesting lessons for food security debates
403 and programmes emerge.

404 First, when examining the linkages between women's agency and food security achievements
405 with a quantitative analysis, we evidenced that different indicators of agency and even
406 different types of decisions within one indicator of agency are associated with different
407 components of food security. These results are in line with earlier studies (e.g. Malapit et al.,
408 2015a; Malapit and Quisumbing, 2015) but our cross-country analysis further highlights the
409 diversity of patterns and the diversity of roles that socio-economic structures play in shaping
410 these patterns across countries.

411 This points to the challenges to select the right indicators and to conduct cross-country
412 comparative analyses with similar sets of indicators. Our quantitative analysis shows
413 interesting patterns between women's empowerment and food security but their diversity
414 across countries and across indicators of empowerment and food security raises more
415 questions than provides answers. Whereas the quantitative findings point to some of the intra-
416 community and intra-household factors that influence the pathways linking women's
417 empowerment and food security, the qualitative analysis from Nepal allows digging into some
418 of this complexity and evidences how some of these factors, such as caste, class and
419 migration status, among others, intersect to produce different empowerment and food security

420 trajectories. This leads us to question the relevance of implementing a one-size-fits-all
421 intervention for empowering rural women farmers or increasing household food security –
422 even within one community. We rather defend the importance of adopting a contextualised
423 and intersectional approach in food security programmes that addresses the structural barriers
424 that keep the marginalised, excluded and powerless food insecure. This means disaggregating
425 the category of ‘women’ for project design, monitoring and evaluation, and moving beyond
426 single distinct categories (e.g. separately considering gender, class, ethnicity), by intersecting
427 categories (e.g. landless Dalit woman, Chhetri woman with migrated husband in small
428 landholding household etc). Beyond caste, ethnicity and class, age and position in the
429 household also matter in feelings of empowerment – this was only slightly touched upon in
430 this paper, but better developed elsewhere, drawing on data from the same sites (Anonymous,
431 forthcoming).

432 Such an intersectional approach then would allow a better understanding of food insecurity as
433 a process: namely, how one’s ability to exercise agency to become food secure is embedded
434 in institutions (including social norms) and political-economic structures. In our findings for
435 Bangladesh, increased women’s agency reduces the likelihood of their household to face food
436 shortages but female-headed households remain more vulnerable to food shortage even after
437 controlling for women’s agency. Similarly, our interviews in Nepal show that the entrenched
438 social barriers for Dalit women to access land and water resources affect their ability to
439 benefit from water and food security projects. Global food security discourses therefore need
440 to bring the role of institutions and political-economic structures to the fore: how they shape
441 the diverse women’s and men’s differentiated capabilities to benefit from food security
442 programmes, engage in markets, influence food production and distribution systems and food
443 policies. Increased individual agency in agricultural production does not necessarily allow
444 marginalised women overcoming the structural barriers that prevent them achieving what they

445 value, including a decent and non-exploitative way to be food secure. Furthermore, in Nepal,
446 social relationships play a central role in perceptions of empowerment through emotional,
447 mental and labor support and the sharing of knowledge and skills across gender, class and
448 ethnicity differences – in this perspective, empowerment largely goes beyond increasing the
449 agency of isolated individuals.

450 Lastly, our qualitative findings underline the importance of jointly examining one’s increased
451 agency with the local meanings and values associated to this agency. Increased agency feels
452 like empowerment only when it helps achieving what one values. This has major implications
453 for food security programmes in the context of migration: as women with migrated husbands
454 might be considered more empowered on the basis of decision-making indicators,
455 programmes might shift investments to different targets. Yet in Nepal, these women do not
456 necessarily perceive their increased agency as a form of empowerment. Most of the women
457 we met rather find it stressful, particularly when they lack the mental and emotional support
458 from their relatives to exercise this agency. In addition, our findings point to the role of
459 critical consciousness in the empowerment process: entering male spaces might not be
460 perceived as empowering if the boundaries and norms of these spaces seem ‘natural’ and
461 remain unquestioned. Food security programmes also have a role to play here – in engaging
462 both marginalised men and women in critical discussions on unequal food production and
463 distribution systems.

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APPENDIX.

Table B1. Women's decision and the share of produce retained for feeding the household in Bangladesh

	OLS regressions		
	Aman rice	Vegetables	Aquaculture
Female decides how to use agricultural produce	-1.506 (3.693)	6.111** (3.104)	5.338 (3.383)
Wealth index	0.964 (0.878)	0.137 (0.720)	-0.631 (0.792)
Area of land owned, in hectare	0.418 (2.154)	-7.804*** (1.881)	1.296 (2.140)
Hindu	2.373 (3.380)	7.713*** (2.729)	2.090 (2.986)
Female headed household	-1.363 (4.582)	10.26** (4.230)	2.609 (4.313)
Age of the head of the household	0.370*** (0.123)	0.102 (0.0946)	0.0353 (0.105)
N	345	525	422
R-squared	0.039	0.076	0.011

Source: Data collected by authors.

All regressions are conducted by authors. The coefficients are reported, along with the standard errors in parentheses.

The standard errors are clustered at the village level. ***, ** and * depict significance at 99%, 95% and 90% respectively.

Table N1. Women's empowerment and the share of produce retained for feeding the household in Nepal – OLS regressions

	Cereals	Vegetables
Input in productive decisions	-2.342 (2.337)	-2.005 (2.138)
Control over the income	-3.368 (2.143)	-3.995** (1.977)
Ownership of assets	0.421 (5.549)	1.077 (5.390)
Access to and decisions about credit	3.446* (1.806)	3.186* (1.654)
Group membership	-1.278 (1.727)	0.588 (1.607)
Workload	-0.986 (1.971)	-0.880 (1.848)
Age head of the household	0.0970 (0.0736)	-0.0144 (0.0680)
Female headed household	4.487** (1.917)	0.0581 (1.776)
Dalit household	4.725 (3.045)	4.992* (2.640)
Janajati household	-1.145 (1.892)	5.648*** (1.747)
Number of household members	0.160 (0.410)	0.00782 (0.390)
Area of land owned, in hectare	-17.60*** (3.125)	-2.550 (2.945)
Income from remittances	-2.534 (1.876)	-3.612** (1.716)
N	361	402
R-squared	0.139	0.0883

Source: BRACED Anukulan Baseline survey.

All regressions are conducted by authors. The coefficients are reported, along with the standard errors in parentheses.

The standard errors are clustered at the village development committee (VDC) level. ***, ** and * depict significance at 99%, 95% and 90% respectively.

Table T1. Women's decisions and the share of produce retained for household consumption in Tajikistan – OLS regression

	Maize	Capsicum	Cucumber	Eggplant	Tomato	Onion	Potato
Female decides share of harvest retained for hh-consumption	-0.06 (0.02)*	0.02 (0.02)	0.02 (0.01)	0.001	-0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Household with at least one male migrant	-0.01 (0.01)	0.01 (0.01)	0.03 (0.01)***	0.01 (0.01)	0.01 (0.01)	0.01 (0.007)*	0.01 (0.005)**
Household earns income from wages	0.02 (0.02)	0.01 (0.01)	0.02 (0.01)	0.01 (0.01)	0.02 (0.01)**	0.03 (0.02)**	0.01 (0.01)
Family size	-0.01 (0.01)	-0.000 (0.01)	-0.01 (0.01)	-0.001 (0.005)	-0.01 (0.004)	-0.002 (0.01)	-0.002 (0.005)
Number of female members	0.03 (0.02)	-0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)**	0.003 (0.01)	0.01 (0.01)
Age of the head of the household	0.001 (0.001)	0.001 (0.001)	-0.001 (0.001)	-0.002 (0.0003)	-0.0002 (0.0003)	0.0001 (0.0005)	0.000 (0.000)
Household fetches drinking water from a public tap†	0.05 (0.02)**	0.03 (0.02)*	-0.01 (0.02)	-0.001 (0.01)	0.02 (0.02)	0.004 (0.02)	0.03 (0.02)*
Presence of piped water in the house†	0.05 (0.02)***	0.04 (0.02)**	-0.01 (0.02)	-0.03 (0.02)	-0.002 (0.01)	0.02 (0.02)	-0.02 (0.02)
Gas or electric stove used for cooking	0.03 (0.02)	-0.01 (0.01)	-0.01 (0.02)	-0.01 (0.01)	-0.001 (0.01)	0.02 (0.02)	0.01 (0.01)
Dwelling has wood flooring	-0.003 (0.02)	-0.002 (0.02)	0.01 (0.001)	0.01 (0.01)	0.003 (0.01)	0.02 (0.02)	0.01 (0.01)
Highest education attainment at least high school	0.02 (0.02)	0.001 (0.02)	0.0001 (0.02)	0.002 (0.01)	-0.02 (0.01)*	-0.01 (0.02)	0.001 (0.01)
At least one household member has vocational training	-0.01 (0.02)	0.003 (0.02)	0.02 (0.02)	0.003 (0.01)	-0.01 (0.01)	-0.001 (0.02)	0.01 (0.01)
Female decides* piped water in house	-0.02 (0.05)	-0.02 (0.03)	-0.07 (0.04)*	-0.02 (0.04)	-0.03 (0.03)	0.004 (0.04)	-0.03 (0.04)
Female decides * household has male migrants	0.01 (0.04)	0.01 (0.02)	-0.02 (0.02)	0.01 (0.02)	-0.001 (0.01)	-0.05 (0.03)**	-0.03 (0.02)
N	523	863	784	651	1418	619	1213
Prob> F	0.19	0.64	0.1318	0.8917	1915	0.2272	0.1095
R-squared	0.04	0.02	0.03	0.01	0.01	0.02	0.120

Source: Data collected by authors.

† these variables are dummies for source of domestic water: public tap or piped water in the house, with drawing water from canals as the default.

All regressions are conducted by authors. The coefficients are reported, along with the standard errors in parentheses.

The standard errors are clustered at the village level. ***, ** and * depict significance at 99%, 95% and 90% respectively.

Table B2. Women's decision and food shortage in Bangladesh

	Tobit regressions				Logit regressions	
	Number of months with food shortage		Number of months with acute food shortage		At least one month of food shortage	
Female decides how to use agricultural produce	-0.726*		-2.461		-0.0405	
	(0.431)		(1.855)		(0.0539)	
Female decides how to use income from crop sales		-1.404***		-5.375**		-0.176***
		(0.417)		(2.308)		(0.0482)
Wealth index	-0.408***	-0.419***	-0.457	-0.304	-0.0644***	-0.0641***
	(0.100)	(0.0998)	(0.382)	(0.371)	(0.0130)	(0.0128)
Area of land owned, in hectare	-1.804***	-1.482***	-0.757	-0.686	-0.214***	-0.175***
	(0.324)	(0.298)	(0.946)	(0.913)	(0.0460)	(0.0416)
Hindu	-0.435	-0.450	2.719*	2.344*	-0.0572	-0.0553
	(0.380)	(0.378)	(1.438)	(1.392)	(0.0479)	(0.0473)
Female headed household	1.665***	1.675***	-2.242	-1.188	0.178***	0.176***
	(0.540)	(0.546)	(2.246)	(2.063)	(0.0664)	(0.0664)
Age of the head of the household	-0.00441	-0.00318	-0.0346	-0.0291	-0.000305	-0.000186
	(0.0135)	(0.0132)	(0.0519)	(0.0499)	(0.00173)	(0.00170)
N	583	593	583	593	583	593
Pseudo R-squared	0.0398	0.0392	0.0249	0.0351	0.1063	0.1082

Source: Data collected by authors.

All regressions are conducted by authors. The coefficients are reported for tobit regression and marginal effects (dy/dx) are reported for logit regressions, along with the standard errors in parentheses.

The standard errors are clustered at the village level. ***, ** and * depict significance at 99%, 95% and 90% respectively.

Table N2. Women's empowerment and the yields of cereals in Nepal – OLS regression

	Rice productivity	Wheat productivity
Input in productive decisions	161.3 (177.0)	-186.0 (144.4)
Control over the income	-160.8 (150.6)	284.9** (127.8)
Ownership of assets	669.6* (378.3)	112.6 (348.8)
Access to and decisions about credit	101.4 (133.9)	-481.0*** (108.2)
Group membership	61.99 (121.4)	-1.803 (97.86)
Workload	133.2 (142.3)	146.5 (118.8)
Age head of the household	-2.230 (5.163)	-8.494** (4.172)
Female headed household	-2.956 (136.5)	-158.8 (111.0)
Dalit household	-195.8 (180.6)	-155.5 (150.9)
Janajati household	307.0** (135.0)	351.4*** (111.3)
Number of household members	33.44 (30.05)	20.78 (24.76)
Area of land owned, in hectare	-145.8 (225.9)	-31.90 (176.6)
Income from remittances	177.4 (128.9)	295.9*** (106.8)
N	422	397
R-squared	0.049	0.121

Source: BRACED Anukulan baseline survey.

All regressions are conducted by authors. The coefficients are reported, along with the standard errors in parentheses.

The standard errors are clustered at the VDC level. ***, ** and * depict significance at 99%, 95% and 90% respectively.

Table T2. Women's decisions and the adoption of a coping strategy in Tajikistan – logit regression

	Eat cheap food	Reduce quantity in each meal	Spend day without eating	Borrow money from friends	Purchase food on credit	Eat stored seeds	Sell items for money
Female decides share of harvest retained for hh consumption	0.158***	0.123***	0.0401	-0.00869	0.0830**	0.0367	-0.0158
	-0.0367	-0.0368	-0.0244	-0.0344	-0.0361	-0.0363	-0.0358
Household with at least one male migrant	0.0219	0.0159	-0.0259	-0.0209	0.0035	-0.037	-0.0425*
	-0.0228	-0.0234	-0.0184	-0.0223	-0.0226	-0.0231	-0.0228
Household earns income from wages	-0.00204	-0.0643**	-0.0163	-0.0284	0.0172	-0.0256	0.0134
	-0.0282	-0.0285	-0.02	-0.0266	-0.0277	-0.0281	-0.0278
Family size	-0.00488	-0.00267	-0.00593	-0.0168	0.00658	0.0265**	0.0417***
	-0.0131	-0.0134	-0.00963	-0.0126	-0.013	-0.0131	-0.0129
Number of female members	-0.00167	-0.00641	0.00102	0.03	0.0232	-0.0415*	-0.0333
	-0.023	-0.0235	-0.0168	-0.022	-0.023	-0.0231	-0.0227
Age of the head of the household	0.00109	0.00128	0.00053	-0.000842	0.000407	0.00202*	0.000103
	-0.00106	-0.00108	-0.000747	-0.00101	-0.00104	-0.00106	-0.00105
Household fetches drinking water from a public tap†	-0.0733**	-0.0961***	-0.0267	-0.0386	0.0624*	-0.0789**	-0.00422
	-0.0358	-0.0353	-0.024	-0.0327	-0.0343	-0.0347	-0.035
Presence of piped water in the house†	-0.284***	-0.342***	-0.0885**	-0.214***	-0.170***	-0.196***	-0.150***
	-0.0636	-0.0564	-0.0403	-0.0506	-0.0659	-0.0583	-0.0575
Gas or electric stove used for cooking	-0.0981***	-0.0804***	-0.0392**	-0.0558**	-0.0142	-0.0840***	-0.105***
	-0.0278	-0.0283	-0.0198	-0.0263	-0.0276	-0.0276	-0.0271
Dwelling has wood flooring	-0.0449	-0.039	-0.0570***	-0.0349	-0.114***	0.0205	-0.0226
	-0.0285	-0.0289	-0.0196	-0.0268	-0.0279	-0.0284	-0.028
Highest education attainment at least high school	-0.159***	-0.0877**	-0.0718***	-0.0257	-0.0308	-0.00898	-0.0102
	-0.0384	-0.0386	-0.0232	-0.0361	-0.0378	-0.0381	-0.0377
At least one household member has vocational training	-0.0135	-0.0133	-0.033	0.0106	0.0166	-0.0337	-0.000927
	-0.0339	-0.0344	-0.0223	-0.0322	-0.0333	-0.0335	-0.0333
Female decides* piped water in house	0.123	0.139	0.0625	0.196*	0.159**	0.0594	-0.023
	-0.0753	-0.0904	-0.0994	-0.105	-0.0682	-0.0915	-0.0914
Female decides * household has male migrants	-0.140***	-0.0911*	-0.0249	0.0343	-0.0247	0.00276	0.00338

	-0.0484	-0.0479	-0.0327	-0.0458	-0.0471	-0.0473	-0.047
N	1441	1441	1441	1441	1441	1441	1441
Pseudo R-squared	0.0478	0.0464	0.0351	0.018	0.0304	0.0239	0.0309

Source: Data collected by authors.

† *these variables are dummies for source of domestic water: public tap or piped water in the house, with drawing water from canals as the default.*

All regressions are conducted by authors. The marginal effects (dy/dx) are reported, along with the standard errors in parentheses.

*The standard errors are clustered at the village level. ***, ** and * depict significance at 99%, 95% and 90% respectively*

Table B3. Women's decision and coping strategies in Bangladesh

	Logit regressions										
	Eat cheap food		Reduce food quantity		Spend day without eating		Borrow food		Purchase food on credit		Eat stored seeds
Female decides how to use agricultural produce	-0.0831*		-0.0589		0.0124		0.0215		-0.0366		-0.0237**
	(0.0481)		(0.0399)		(0.0247)		(0.0447)		(0.0439)		(0.0112)
Female decides how to use income from crop sales		-0.192***		-0.108***		0.0164		-0.0600		-0.100**	
		(0.0428)		(0.0373)		(0.0229)		(0.0387)		(0.0396)	
Wealth index	-0.0432***	-0.0432***	-0.0521***	-0.0568***	-0.00907*	-0.00850	-0.0367***	-0.0406***	-0.0372***	-0.0416***	-0.00346
	(0.0119)	(0.0119)	(0.0103)	(0.0104)	(0.00526)	(0.00521)	(0.0102)	(0.0101)	(0.0107)	(0.0107)	(0.00328)
Area of land owned, in hectare	-0.170***	-0.135***	-0.101***	-0.0808**	0.00202	0.000274	-0.0835**	-0.0501	-0.142***	-0.0961***	-0.0217
	(0.0436)	(0.0395)	(0.0381)	(0.0351)	(0.0151)	(0.0149)	(0.0365)	(0.0314)	(0.0410)	(0.0363)	(0.0141)
Hindu	-0.0616	-0.0659	0.0175	-0.00473	0.0134	0.0123	-0.110***	-0.104***	-0.0203	-0.0296	0.0331**
	(0.0443)	(0.0442)	(0.0386)	(0.0387)	(0.0209)	(0.0205)	(0.0370)	(0.0366)	(0.0401)	(0.0396)	(0.0159)
Female headed household	0.132*	0.126*	0.0399	0.0795	-0.0207	-0.0157	0.0827	0.0761	0.0471	0.0350	-0.00939
	(0.0688)	(0.0696)	(0.0595)	(0.0644)	(0.0241)	(0.0253)	(0.0641)	(0.0650)	(0.0626)	(0.0631)	(0.0133)
Age of the head of the household	-0.000624	-0.000369	-0.000387	-9.71e-05	-0.000815	-0.000779	-0.000862	-0.000520	0.000322	0.000194	-0.000394
	(0.00161)	(0.00159)	(0.00136)	(0.00136)	(0.000732)	(0.000714)	(0.00138)	(0.00134)	(0.00144)	(0.00141)	(0.000452)
N	583	593	583	593	583	593	583	593	583	593	583
Pseudo R-squared	0.071	0.0802	0.0757	0.084	0.0194	0.0179	0.0587	0.0567	0.0569	0.0586	0.0755

Source: Data collected by authors.

All regressions are conducted by authors. The marginal effects (dy/dx) are reported, along with the standard errors in parentheses.

The standard errors are clustered at the village level. ***, ** and * depict significance at 99%, 95% and 90% respectively.

Table N3. Women's empowerment and the likelihood of malnutrition for under 2 children – logit regression

	Stunting	Wasting	Underweight
Input in productive decisions	-0.0338 (0.0848)	-0.0122 (0.0591)	-0.0264 (0.0715)
Control over the income	0.0845 (0.0791)	-0.0485 (0.0615)	0.0323 (0.0605)
Ownership of assets	0.0689 (0.300)		-0.102 (0.281)
Access to and decisions about credit	-0.135** (0.0678)	-0.0406 (0.0464)	-0.121** (0.0527)
Group membership	0.0520 (0.0644)	-0.0185 (0.0447)	-0.0531 (0.0525)
Workload	0.0376 (0.0788)	0.0283 (0.0515)	-0.0500 (0.0676)
Age head of the household	0.00110 (0.00277)	-0.00482** (0.00196)	-0.00293 (0.00221)
Female headed household	-0.0389 (0.0744)	-0.0409 (0.0495)	-0.0168 (0.0590)
Dalit household	-0.186** (0.0822)	-0.0655 (0.0499)	-0.0678 (0.0612)
Janajati household	-0.0986 (0.0726)	-0.0493 (0.0478)	-0.0888 (0.0568)
Number of household members	0.00930 (0.0162)	0.0211** (0.0107)	0.0154 (0.0128)
Area of land owned, in hectare	-0.0691 (0.114)	-0.0335 (0.0786)	0.000633 (0.0858)
Income from remittances	-0.0509 (0.0678)	-0.119*** (0.0422)	-0.0270 (0.0530)
N	265	264	267
Pseudo R-squared	0.0387	0.0687	0.0441

Source: BRACED Anukulan baseline survey.

All regressions are conducted by authors. The marginal effects (dy/dx) are reported, along with the standard errors in parentheses.

The standard errors are clustered at the VDC level. ***, ** and * depict significance at 99%, 95% and 90% respectively.