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<th>Description</th>
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<td>Access to Basic Service</td>
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<td>AC</td>
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<tr>
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<tr>
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</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
<tr>
<td>FDMN</td>
<td>Forcibly Displaced Mayanmar Nationals</td>
</tr>
<tr>
<td>FSS</td>
<td>Food Security Sector</td>
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<tr>
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<td>Focus Group Discussion</td>
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</tr>
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<td>International Non-Government Organization</td>
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EXECUTIVE SUMMARY

This report summarizes the results of Resilience Index Measurement Analysis (RIMA), which aimed to assess household resilience capacity by identifying key determinants and casual factors influencing resilience. The analysis was conducted with data collected from multiple population groups to highlight the diversity of the situation. Within the host community, the study gathered information from 1000 households in four sub-districts (Cox’s Bazar Sadar, Ramu, Ukhia, and Teknaf) of Cox’s Bazar that received interventions from the Food and Agriculture Organization of the United Nations (FAO) and the World Food Program (WFP) as the treatment group. For comparison, 386 households from the host community that didn’t receive support from any humanitarian actors were surveyed in three sub-districts (Ramu, Ukhia, and Chakaria) of Cox’s Bazar to act as the control group. Similarly, for the Rohingya community, 400 households who received agriculture support from WFP were surveyed as the treatment group, while information of the additional 400 Forcibly Displaced Mayanmar Nationals (FDMN) that didn’t receive any agriculture support from any agency was collected to be the control group. Altogether, these 2186 households’ data were collected from October to December 2021 along with a number of FGDs and KIs for in-depth insights and triangulation. The report outlined the resilience index in different disaggregation like treatment vs control, resilience index by farmer category, sub-district wise resilience index, and resilience index by household head sex.

The study reveals that for the host community, the treatment group has a higher resilience capacity than the control group. The higher resilience of the treatment group can be characterized by their access to productive, non-productive assets, and savings. Moreover, the usage of technology like climate smart agriculture, integrated pest control and conservation agriculture practice in agricultural production is higher among the treatment group than in the control which also contributes to better resilience capacity. Simultaneously, it is seen that marginal farmers in the treatment group had the lowest resilience among three groups: marginal, large, and smallholder farmers. The lowest resilience capacity of the marginal farmers can be described by their limited ownership of productive assets, non-productive assets, and land. In addition, their low resilience capacity is due to their inability to store crops for the lean period, their limited use of technology like climate smart agriculture, integrated pest control and conservation agriculture practice in agricultural production, and their restricted access to savings and loans compared to large and smallholder farmers. Furthermore, a significant difference in resilience capacity between female-headed and male-headed households is identified. Due to their limited access to savings and loans, lower asset ownership, and inadequate crop storage during the lean period, the resilience capacity of female-headed households is relatively low. On the other hand, Ukhia and Teknaf have a lower level of household resilience than the other two subdistricts. Limited ownership of productive, non-productive assets and land are the contributing factors for their low resilience.

Within the FDMN group, households that received agriculture support are more resilient than those that didn’t receive such support. The low resilience of the control group is characterized by their limited access to asset ownership like productive assets, and ownership of poultry. Besides, lack of usage of fertilizer and organic maure in agricultural production are also responsible for the low resilience of the FDMN control group. The analysis also indicates that FDMN households headed by men are more resilient than those headed by women. However, the difference is not particularly significant.

In addition, the study determined the land utilization pattern and the amount of land utilized by household members. The respondents of the host community utilize an average of 146 decimal land for agricultural production when both the control and treatment groups are considered, with large farmers having the largest usage of land for agricultural production (415 decimal from treatment and
351 decimals from control). In contrast, the least usage of land is traced among the marginal farmers (58 decimal of the treatment group and 78 decimal of the control group). Concurrently, the major share of land (55 percent from the treatment group and 63 percent from the control group) is used to produce cereal crops like rice, maize, etc. Besides, a remarkable portion of land is also used for vegetable production (27 percent from the treatment group and 24 percent from the control group). The most cultivated cereal crop by the host community is Aman and Boro rice and the most cultivated vegetables are potato, chili, brinjal, bean, and sweet gourd. In the camp area sweet gourd, bottle gourd, and yard-long bean are the most cultivated vegetables.

According to the survey, around 33 percent of respondents from the host community received cash transfers in the last 12 months, with the average amount being BDT 3,258. (BDT 4,269 from the treatment group and 639 from the control group). None of the households of the FDMN community receive cash transfers. In contrast, almost all of the FDMN community households received in-kind transfers such as food, shelter, medical facilities, agricultural supplies, LPG, and so on in the last 12 months, with an average value of BDT 78,520 (82,621 from the control and 74,419 from the intervention) per household. Food assistance accounted for most of the in-kind transfer (74 percent), followed by LPG gas (12 percent), and shelter (4 percent). In contrast, the host community only received a small number of in-kind transfers—on average, BDT 8,637—in comparison to the FDMN.

The average monthly income of the households from the host community is BDT 14,694 (average BDT 15,596 for the treatment group and average BDT 12,358 for the control group). In both groups, large farmers are the highest income earners and there is a significant gap in income between the large and the marginal farmers. However, the major share of host community household income is coming from the agricultural sector which is around 49 percent (47 percent from treatment and 55 percent from the control group). On the other hand, the average monthly income is significantly low for the FDMN community which is worth BDT 2,436 (average BDT 2,517 Treatment group and average BDT 2,354 Control group). This is due to their limited opportunities to engage in activities to generate revenue. Furthermore, the limited opportunities for livelihood in the camp area contribute to their low income. The majority of FDMN household income (52 percent) is generated through day labor activities (53 percent from treatment and 51 percent from control).

The study also identified the food consumption status of the host and the refugee community. It is found that almost one-third (31 percent) of households from the host community are suffering from inadequate food consumption (Borderline and poor consumption). In contrast, half of the households from the refugee community are going through inadequate consumption. Besides, around 50 percent of households from the host community (55 percent from treatment and 65 percent from control) and 80 percent of households from the Rohingya community (77 percent from the treatment and 82 percent from control) are adopting at least one consumption-based coping strategy to cope with food crisis. Dependence on less preferred or less expensive food is the most commonly used coping strategy in both the host (54 percent) and FDMN (69 percent) communities. Additionally, more than one-third (39 percent) of host community households had to adopt at least one crisis or emergency livelihood coping approach, while 40 percent has undertaken at least one stress management technique. On the other hand, more than two-thirds (67 percent) of households from the FDMN community follow at least one crisis or emergency strategy and 22 percent follow the stress strategy. A significant portion of households both in the host and the refugee community are facing inadequate resource constraint to independently cover their basic needs, likely due to the pandemic’s impact on the local economy and unsustainable livelihoods strategy.

Overall the study will help to determine the resilience capacity of the households by identifying the key determinants affecting the resilience capacity which will help to understand where the
intervention needs to focus in future programs. Furthermore, by providing a baseline value, the study will also help to measure the impact of the intervention among the beneficiaries in the future.
1. INTRODUCTION

Cox’s Bazar, is a disaster-prone district in south-eastern Bangladesh, with a population of 2.98 million people (BBS, 2015), and hosts the world’s largest refugee community. Over 925,380 Rohingya refugees reside across 34 congested camps in Ukha and Teknaf sub-districts (UNHCR, 2022). The geographic context of Cox’s Bazar coupled with human pressure and the unsustainable exploitation of natural resources makes this district especially vulnerable to natural hazards and falls under Phase 3 of IPC Chronic Food Insecurity (FAO and WFP, 2022). This huge population created massive pressure on the already dilapidate environment of Cox’s Bazar and around 4,300 acres of hills and forests were cut down or cleared of vegetation to make temporary shelters, facilities, and cooking fuel in Ukhia and Teknaf of Cox’s Bazar, threatening the biodiversity of the three ecologically critical areas of the country (UNDP and UN WOMEN, 2018). The refugee crisis has significant impacts on the local economy and livelihoods of the host community population at Cox’s Bazar, including a highly competitive labor market with reduced wages, inflation of prices for basic goods (including food and transportation), loss of crop and grazing land. Several humanitarian actors are working in Cox’s Bazar after the influx to improve the living standard of the affected people. However, the humanitarian response to the crisis in Cox’s Bazar, Bangladesh is entering a new phase transitioning to the development approach, and the development paradigm is driving to increase the resilience capacity of the vulnerable people. As such, FAO has undertaken the first round of Resilience Index Measurement and Analysis in Cox’s Bazar involving both host and refugee communities to measure the current resilience capacity and its determinants as a baseline to gauge the intervention results.

1.1. Objective

The RIMA study aims to provide evidence to support program monitoring and evaluation while also exploring internal and external factors which contribute to resilience and determining appropriate strategies by answering questions such as: who is most in need, where should investment focus in terms of geographical location, which dimensions of resilience must be supported, and to what extent have interventions increased or decreased target populations’ resilience. The following are the specific objectives of RIMA:

- Measure the resilience capacity of the communities determining the resilience score.
- Identify the determinants and casual factors that affect the resilience capacity of the community.
- Determine strategies that will yield positive results to increase resilience capacity.
- Provide baseline value to compare changes in the future.

___________________________

1 access to basic services and infrastructure, adaptive capacities, formal and informal social safety nets, social networks, productive and non-productive assets, and shocks as well as livelihoods
2. METHODOLOGY

2.1. How RIMA works
RIMA is primarily a quantitative approach to measure the household resilience capacity index (RCI). It allows stakeholders to explain why some households cope with shocks better than others and provides a rigorous framework for both humanitarian and development initiatives. Because resilience is a dynamic concept, it necessitates a dynamic analytical framework. A broad contrast between immediate needs and long-term intervention positions the resilience discussion within the debate over emergency and development response mechanisms. This has implications for the response; first, a lengthy time frame is required to assure the effectiveness of response mechanisms. It is likely that the well-being indicators fluctuate during the short and medium-term and finally stabilize over the long term. Secondly, when a shock occurs there may be long-lasting consequences for household assets and livelihoods (For example, selling assets is a common strategy, but the impact on the households standard of living depends on the assets sold). Thirdly, a distinction needs to be made in terms of long-term and short-term interventions. Policies aimed at strengthening resilience or minimizing the decrease in well-being as a result of a shock have either immediate (food for work programs, transfer mechanisms) or long-term effects (food for work projects, transfer mechanisms, typically education). A conceptual framework for measuring resilience must account for all potential pathways to well-being in the face of shocks.

The resilience capacity index is constructed upon 4 pillars and linked to a specific outcome (e.g. food insecurity); it also includes shock/stressor (e.g. climate change). However, the specific outcome has to reflect the purpose and scope of the project assessed. The four traditional pillars are:

i. **Access to basic Services (ABS)**: shows the ability of a household to meet basic needs, and access effective use of basic services; e.g., access to schools/learning centers, health facilities; infrastructures, and markets.

ii. **Assets (AST)**: comprises both productive and non-productive assets of households and community assets. Examples of indicators include land, livestock, and durables; other tangible assets such as a house, vehicle, and household amenities reflect the living standards and wealth of a household.

iii. **Social Safety Nets (SSN)**: measures the ability of households to access assistance provided by international agencies, charities, and NGOs, as well as help from relatives and friends

iv. **Adaptive Capacity (AC)**: is the ability of a household to adapt to a new situation and develop new livelihood strategies. The adaptive capacity in social systems is strictly connected to the existence of institutions and networks that represent learning and store knowledge and experience, creating flexibility in problem

2.2. Study area profile
The survey contains a comparison between treated households, i.e., those who received intervention from humanitarian actors, and untreated/control households, i.e., those who did not receive intervention and were directly involved in agricultural activity, including Rohingya camp residents. The study includes five sub-districts/Upazila of the Cox’s Bazar district that were affected by the 2017 Rohingya influx in terms of socioeconomic situation and environment. The study area profile is as given below.
Figure 1. Study area and sampling distribution
2.3. Data collection

2.3.1. Document review

RIMA guidance and published reports (FAO, 2015; FAO, 2016) and documents like Refugee Influx Emergency Vulnerability Assessment reports (WFP, 2022; WFP, 2021) along with those from BBS, FSS, ISCG, UNDP and UN WOMEN (UNDP and UN WOMEN, 2018) were reviewed for the study design and triangulation.

2.2.2 Household Questionnaire Survey:
The collection of data began in October 2021 and was concluded in December 2021. The respondents were selected through probable sampling procedures. The online open-source KoBo toolbox has been used to collect the data of the FAO-supported beneficiaries and the control group of the host community. On the other hand, data of the WFP-supported beneficiary both from the host and FDMN community were collected using MODA. The FAO facilitated the selection of fifteen enumerators from the implementing partner or Shushilan due to having prior expertise of collecting data in host communities and camps. The respondents from the host communities are agricultural farmers with National Identification Number (NID), own and lease at least 0.5 hectares of land, work with livestock, culture fish, dry fish, forestry and agroforestry, and produce agricultural products for subsistence/commercial or mixed approaches. Respondents from the Rohingya communities are individuals registered with UNHCR who are engaged in or plan to engage in homestead agriculture or other activities.

2.2.3 Key Informant Interview (KII)
The key informant interview was aimed to explore in-depth key information. The questionnaire was semi-structured, and the interview duration was average 40 minutes for the individual. The interview was taken from the government agricultural extension officials, community leaders, and development activists.

2.3.2 Focus Group Discussion (FGD)

30 Focus group discussions (FGD) were being conducted to get more in-depth information about the situation, causal effects, and recommendations. The agricultural farmers/producers of the four districts in the host communities were the participants.

2.4. Sampling

2.4.1. Sampling formula

The following formula has been used for sample size determination:

\[ n = \frac{Z^2 \cdot p \cdot (1-p) \cdot N}{Z^2 \cdot p \cdot (1-p) + N \cdot (e)^2} \]

Where, 
- \( n \) = sample size,
- \( N \) = population size
- \( e \) = the level of precision (4 percent or 0.04),
- \( z \) = the value of the standard normal variable given the chosen confidence level

It should be noted that, the refugee context, geographical features, and external and internal factors are unique throughout the country including other sub-districts (Upazilas) of the district. Therefore separate sampling strategies as well as precision and confidence interval was applied for different stratas using the formula above.
2.4.2. Sampling frame
2.4.2.1. Sample size for the host community
In total, 1386 samples were selected from the Host community of which 1000 are treatment\(^2\) and the rest 386 represent control group\(^3\).

2.4.2.1.1. FAO supported beneficiaries
The respondents in the treatment groups of the survey were agricultural farmers’ HHs from Cox's Bazar Sadar, Ramu, Ukha, and Teknaf sub-districts\(^4\) who had received agricultural support at least once or even more. The agricultural farmers are heterogeneous in terms of farm size (i.e. large or smallholders), productivity, income, and food expenditure. Considering this factors, the study team applied three staged stratified random sampling to select 700 HHs from 28000 FAO supported beneficiaries with a confidence level of 96 percent (\(z = 2.08\)) and design effect of 1.05.

2.4.2.1.2. WFP supported beneficiaries
The households of agricultural farmers in two sub-districts (Ukhia and Teknaf) who had received agricultural support from the WFP were surveyed. Following the formula above and applying a 95 percent confidence level and 6 percent precision the sample size was determined to be 300.

2.4.2.1.3. Control group
The study team identified three areas a) Surajpur-Manikpur and Harbang union under Chakaria sub-district; b) Jalia Palong union of Ukhia sub-district; and c) Khunia Palong union under Ramu sub-district and selected 386 samples as control group representatives from Host community\(^5\) where 10,000 farmers are untreated and socio-economic similarities are found\(^6\). For this, 5 percent or 0.05 level of precision (\(z = 1.96\)), 1.05 design effect was applied to determine a sample size of 386 to be surveyed through stratified random sampling.

2.4.2.2. Sample size for the FDMN community
In total data from 800 FDMN HHs were collected of which half were treatment and the remaining half served as control samples.

2.4.2.2.1. Treatment group
The samples were drawn from the 30,000 Rohingya households receiving vegetable seeds from WFP in August 2021 as part of building self-reliance. Applying 95 percent confidence level and 5 percent precision the sample size was determined to be 400\(^7\).

2.4.2.2.2. Control group
400 households of Rohingya communities in Cox’s Bazar who did not receive agricultural support services but have received alternative support services have been considered as the control samples by using the same formula.

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\(^2\) The respondents who have received agricultural support and other support one or more times from humanitarian actors specially for the FAO and WFP were considered as the treatment group.

\(^3\) The respondents who didn’t receive agricultural or any other support from the from humanitarian actors were considered as the control group.

\(^4\) Six UN agencies including FAO and 32 NGOs works in these four sub-districts

\(^5\) For the sake of attribution treatment sub-districts were avoided as lots of service providers are intervening.

\(^6\) Total 123,258 registered farmers by DAE (Source: DAE, Agricultural Office, Cox’s Bazar).

\(^7\) The context of the host communities and Rohingya communities are not alike in terms of the stratification of agricultural groups. WFP and UNHCR provides blanket assistance for food and basic services to 195,257 Rohingya households residing in 34 camps (UNHCR, 2022). The agricultural activities have been started inside the camp as homestead gardening.
Table 1. Sampling distribution in different sub-district of the Cox’s Bazar

<table>
<thead>
<tr>
<th>Sub-district</th>
<th>Host community</th>
<th>FDMN Community</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment</td>
<td>Control</td>
</tr>
<tr>
<td>Chakaria</td>
<td>-</td>
<td>227</td>
</tr>
<tr>
<td>Cox’s Bazar Sadar</td>
<td>220</td>
<td>-</td>
</tr>
<tr>
<td>Ramu</td>
<td>222</td>
<td>101</td>
</tr>
<tr>
<td>Ukhia</td>
<td>297</td>
<td>58</td>
</tr>
<tr>
<td>Teknaf</td>
<td>261</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
<td>386</td>
</tr>
</tbody>
</table>

2.5. Limitations

- It was tough to find the control group beneficiary because, after the Rohingya influx lots of humanitarian actors are providing support across the Cox’s Bazar district especially in Ukhia, Teknaf, Ramu, and Cox’s Bazar Sadar sub-district. For that reason, a separate sub-district (Chakaria) was selected to find the control group.
- As the majority of the respondents were farmers, sometimes they have urgency to work in the field and were unable to give time for the survey. Therefore, enumerators have to visit a respondent more than one time to have his/her convenient time.
- RIMA is a global tool developed by FAO and it has been implemented for the first time in Cox’s Bazar, Bangladesh. Hence, to contextualize the tool frequent field testing was done which affected the period of data collection.
- The respondents had to recall the year-round production data which was a bit challenging as they forgot it sometimes. The enumerators had to ask several probing questions to help them to recall.
- The context of the Rohingya and the host community is different therefore set of variables used to determine the resilience index is different.
3. RESULTS AND FINDINGS

3.1. Demographic profile of the households

3.1.1. Household size

The average household size of the host community within the five surveyed sub-district is 5.9. However, average household size of the treatment group is 6 whereas it is 5.8 for the control group. Among five surveyed sub-district, Cox’s Bazar Sadar proffers an average family size of 6.2 which is the highest. In contrast, 5.6 is the average family size of the Ukhia sub-district which is the lowest spotted from the analysis. Furthermore, the average household size of the male headed household is 6. In contrast, it is 5 for the female headed households of the host community.

On the other hand, the average household size of the FDMN community is 5.1. The average household size of the FDMN treatment group is 5.3 which is higher than the household size of the control group which is 4.8. Besides, the average household size of the male headed household is 5.3. In contrast, average household size of the female headed household is 4.

*Figure 2. Sampling distribution in different sub-district of the Cox’s Bazar*

3.1.2. Dependency ratio

Dependency ratio\(^8\) of the surveyed households indicates that around 50 percent population are of the dependent age within the households from the FDMN community. In the treatment group of the FDMN community, it is found that 51 percent of the household members are from the dependent age group which is bit higher if compared with the control group which is 49 percent.

\(^8\) Dependency ratio refers to the ratio of the dependent aged population (<15 years and >65 years) over the household size and gives insight into the number of people of non-working age, compared with the household size to understand the relative economic burden of the workforce.
On the other hand, the average dependency ratio of the host community is 41 percent which is more than one-third of the surveyed respondents. However, the percentage of dependent aged people is higher in the treatment group 42 percent than in the control which is 40 percent.

*Figure 3. Dependency ratio*

**3.1.3. Sex of household head**

The majority of the respondents who participated in the survey are male-headed especially the households of the host community. Only 6 percent of households are headed by female. In contrast, the percentage of female-headed households are bit higher in the case of the FDMN households. Around 20 percent of households here are led by women.

*Figure 4. Sex of household head*
3.2. Resilience Capacity Index (RCI) of the host community treatment group

The resilience index of the Host community especially the treatment group proffers assorted results in different disaggregation. All the scores discerned from the RIMA Round-1 study will be considered as the baseline value which will be the benchmark for the comparison in the next rounds. However, to have an idea of the resilience index some examples from the study conducted in the other country can be drawn. In Northern Uganda\(^9\) it is found that the resilience index of the host community households of the Adjumani district is 60 and 48 for the Refugee community. Another study was conducted in Somaliland\(^10\) where it was found that the resilience index of the male-headed household is 37.5 and female-headed households is 38.3. However, Resilience Capacity Index (RCI) measured in different disaggregation from RIMA Round-1 study in Cox’s Bazar district is illustrated below.

3.2.1. Resilience Capacity Index (RCI) by sub-district

The study identified that the Resilience Capacity Index (RCI) of Ramu is the highest (52.2) in comparison to all other sub-district where the study has been conducted. The analysis also showed the resilience capacity of the Cox’s Bazar Sadar sub-district is close to Ramu which is the second-highest (50.9). In contrast, a significant difference found between Ramu, Cox’s Bazar Sadar, and Ukhia, Teknaf in terms of resilience index. Teknaf was identified as a sub-district with the least resilience index (36.2). Asset (AST) ownership and then Adaptive Capacity (AC) are the most influential pillars here to determine the resilience index for all of these four sub-districts. From the comparison of Resilience Structure Matrix (RSM) (Figure 28), it is found that Asset (AST) ownership and Adaptive Capacity (AC) are the highest contributor to the Ukhia sub-district than the others. Besides, the impact of Access to Basic Services (ABS) for Cox’s Bazar Sadar is higher than in other sub-districts, and the influence of Social Safety Net (SSN) is higher for Ukhia than all other sub-districts. The low resilience index of Ukhia and Teknaf is mainly characterized by their limited ownership of assets like productive assets, non-productive assets, and land. Moreover, usage of fertilizers and organic manure in agriculture production is also limited there.


\(^10\)https://www.fao.org/resilience/results/en/?page=1&ipp=10&no_cache=1&tx_dynalist_pi1[par]=YToyOntzOjg6ImtleXdvc mRzjtzQj3Oj5SRVNJEIFTkNFIEFOQx2U0ITIFJUE9SVFMiO3M6MToiTCI7czoxOliwi9
3.2.2. Resilience Capacity Index (RCI) by farmer categories

According to the Department of Agriculture Extension (DAE), the farmers are divided into three categories based on their ownership of land. The farmers who have land between 0.05-0.5 acres are considered as marginal farmers, the farmers having ownership of land between 0.5-1.0 acres are recognized as the smallholder farmer, and the farmers having land of more than 1 hectare are considered the large farmer. Considering these criteria, the resilience index has been measured upon these three categories. From the analytics, it appeared that the resilience capacity of large farmers is the highest (62.1). Thereafter, the resilience index for smallholder farmers is higher (49.0), and the marginal farmers’ index is the lowest (36.5). Asset (AST) ownership along with Adaptive Capacity (AC) are the most prominent pillar that determined the resilience index of all these three categories of farmers. From the comparison of the resilience structure matrix (Figure 29) into these three categories, it is perceived that Asset (AST) and Adaptive Capacity (AC) are the most influential pillar contributing most to the large farmers than the other two. In contrast, Social Safety Net (SSN) has a higher influence on the marginal farmers compared to the other two farmer categories. Interestingly, smallholder farmers have the least contribution of Adaptive Capacity (AC) than the other two farmer categories in determining the resilience capacity. The low resilience of the marginal farmers is characterized by their limited ownership of productive assets, non-productive assets, and land. Furthermore, limited storage of crops for the lean period, limited usage of technology like climate smart agriculture, integrated pest control, conservation agriculture practice in agricultural production, and confined access to savings and loans are also responsible for their low resilience capacity.

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11 DAE approved farmers’ selection criteria for Cox’s Bazar.
3.2.3. Resilience Capacity Index (RCI) by sex of household head

It is perceived from the study that a significant gap in the resilience index exists while comparing between households led by males and households led by females. The households led by female members are less resilient (33.0) than the households led by male members (43.8). Asset (AST) ownership thereafter Adaptive Capacity (AC) are the most influential pillar to determine the resilience of male-headed and female-headed households. From the comparison of the resilience structure matrix (Figure 30), it is perceived that the Asset (AST) Ownership and Adaptive Capacity (AC) are contributing more to determining the resilience capacity of male-headed households than the female-headed households. In contrast, Social Safety Net (SSN) is contributing more in determining the resilience of female-headed households than male-headed households. The low resilience of the female-headed households can be described by their limited ownership of productive assets, non-productive assets, and land. Moreover, their limited storage of crops for the lean period, inadequate usage of technology in the agricultural production, and confined access to savings and loans are also responsible to build low resilience index than the male-headed households.
3.3. Resilience Capacity Index (RCI) comparison with control group

A remarkable gap in resilience index between the control group and the treatment group has been found in the study. The treatment group possesses higher resilience index (35.0) than the control group (31.2). Asset (AST) ownership thereafter Adaptive Capacity (AC) again are the most influential pillar contributing to resilience capacity of the treatment households compared to control and the treatment group. From the comparison of resilience structure matrix (Figure 31) it is perceived that the treatment group has a higher impact of Adaptive Capacity (AC) and Social Safety Net (SSN) to determine the resilience index than the control group. In contrast, the control group has a relatively higher impact on Asset (AST) ownership and the Access to Basic Service (ABS) to determine the resilience capacity. The higher resilience capacity of the treatment group can be described by their ownership of productive and non-productive assets and savings. Furthermore, the treatment group's increased use of technology like climate-smart agriculture, integrated pest control, and conservation agriculture practice in agricultural production contributed to better resilience than the control group.
3.4. Resilience Capacity Index (RCI) of FDMN Community

The study detected diversified results in the resilience capacity of the Forcefully Displaced People from Myanmar Nationals (FDMN) in different segregation. The results are illustrated below.

3.4.1. Resilience Capacity Index (RCI) of FDMN by household head sex

The analytics did not find a significant difference in resilience between male-headed and female-headed households in the FDMN community. However, the male-headed households are a bit more resilient than the female-headed households. Ownership of Assets (AST) and then Access to basic services (ABS) are the most influential pillar here to determine the resilience index. The Resilience Structure Matrix (RSM) (Figure 33) shows that male-headed households have a greater impact of AST and ABS pillars to determine their resilience index as compared to female-headed households, making them more resilient. In contrast, Adaptive Capacity (AC) and Social Safety Net (SSN) have a comparatively higher impact to determine female-headed households’ resilience compared to male-headed households. The female-headed households have limited ownership of productive assets, non-productive assets and poultry. Moreover, very few female-headed households are using fertilizer in their agricultural production. Therefore, a difference in resilience capacity is perceived between male-headed and female-headed households.
3.4.2. Resilience Capacity Index (RCI) comparison with control group

A significant gap in resilience capacity is found from the study while comparing the treatment and the control group. It appeared that the treatment group possess a higher resilience index score (25.4) than the control group (19.1). The most influential pillar to determine the resilience index is ownership of assets thereafter Access to Basic services (ABS) to determine the resilience of both control and the treatment group. It is noted from the comparison (Figure 32) that Asset (AST) ownership contributes most in determining the resilience capacity of the treatment group while Access to Basic Service (ABS) is the most influential one for the control group. Meanwhile, Social Safety Net (SSN) is more influential in determining the resilience index of the control group than the treatment group. The low resilience of the control group is characterized by their limited access to productive assets, and ownership of poultry. Besides, less usage of fertilizer and organic manure in agricultural production can be attributed for the low resilience of the control group.
3.5. **Resilience Capacity Index (RCI) comparison between Host and FDMN community**

The households from the host community are more resilient than the households from the FDMN community and there is a significant gap in the resilience index between the host (30.1) and the FDMN community (14.5) as perceived from the study. The resilience index of the host community is almost two times than the FDMN community. To determine the resilience of the host and the FDMN community, asset and then adaptive capacity are the most two influential pillars. From the resilience structure matrix (Figure 34) it is observed that asset, adaptive capacity and access to basic services has the higher influence to determine the resilience index of the host community than the FDMN community. The low resilience capacity of the FDMN community can be characterized by their limited access to asset, less ownership of poultry, few diversity in production, poor storage of crops for the lean period, limited participation in capacity building training program and limited usage of technology in the agricultural production.

*Figure 11. Comparison of Resilience Capacity Index between Host and FDMN community*

![Graph showing Resilience Capacity Index comparison between Host and FDMN community]

3.6. **Access to Basic Services (ABS)**

3.6.1. **Source of lighting**

Around 92 percent of respondents from Host community (91 percent from the control group and 92 percent from the treatment group) use electricity as their main source of lighting. Besides, 30 percent of them have an alternative source of lightings like solar panels and kerosene lamps. On the other hand in Rohingya camps, the main source of lighting is the solar panel. Around 98 percent of respondents (99 percent in the control group and 98 percent in the treatment group) utilize solar panels as their primary source of lighting, with no households utilizing any other alternative sources.

3.6.2. **Source of cooking fuel**

Wood is the dominating cooking fuel for the inhabitants both in the intervention group and in the control group. Around 82 percent of Host community depend on wood for their main source of cooking. Furthermore, 61 percent of them reported that they also have an alternative source for cooking like LPG gas, firewood from nearby local shops, etc. In contrast, in the FDMN community, both the control and the treatment group are fully dependent on the LPG as their main source of cooking. However, only 12 percent of them mentioned that they also have some other source for cooking like leave and grass, agricultural residues, etc.
3.6.3. Distance to basic services

Overall, access to the basic services is better for the treatment group as they have proximity to the school, public hospital, public means of transport, and all other services illustrated in the figure below. The walking distance to reach the school takes 17 minutes for the treatment group while it takes 23 minutes for the control group. To reach the public hospital the respondents from the treatment group have to walk for half an hour whereas the control group needs almost 1 hour. Moreover, to get on public transport like easy bike or taxi, respondents from the treatment group have to walk for 9 minutes. In contrast, for the control group, it takes 21 minutes. Apart from these, the study also traced the walking distance of the agriculture crop market where agriculture crops are sold to the buyer, and the agriculture input market from where the respondents usually buy inputs for their production. It is observed that both agriculture crop and agriculture input markets are within 39 to 40 minutes of walking distance for the treatment group. Contrarily, respondents from the control group need around one hour to reach the markets.

Figure 12. One-way walking distance (min) of host community to basic service

On the other hand, no significant difference in proximity to basic services is found for the FDMN community if compared between treatment and the control. It is because all the FDMN community have to reside within a fixed territory and they are not allowed to go outside of that territory. However, the table below also indicates that it takes less time for the FDMN community to reach the basic services than the Host community. But this is because all the basic services for FDMN is offered within their fixed territory as they are not allowed to go outside of the camp area.
Table 2. One-way walking distance (min) to the basic services of FDMN community (average)

<table>
<thead>
<tr>
<th>Name of basic services</th>
<th>Average distance (min)</th>
<th>Average distance (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment group</td>
<td>Control group</td>
</tr>
<tr>
<td>Primary school</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Health facility</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Public means of transport</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Agriculture crop market</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Agriculture input market</td>
<td>39</td>
<td>39</td>
</tr>
</tbody>
</table>

3.7. Asset (AST)

3.7.1. Land utilization for the agricultural production

On average, 146 decimal land is used by the respondents of the host community considering both the control and the treatment group. The analysis identified that the usage of land is the highest for the large farmers of the treatment group and the average amount of land used by the large farmer is 415 decimal. On the contrary, only 58 decimal is used by the marginal farmers of the treatment group which is the least. Meanwhile, the smallholder farmers are standing in the middle of these two categories which is 194 decimal.

Furthermore, there is a significant difference in usage of land by the farmers of different categories if compared between the treatment and control groups. The amount of land used by the treatment group's large and smallholder farmers is greater than that of the control group's large and smallholder farmers. However, in the case of marginal farmers, the scenario is different. Marginal farmers from the control group are using more amount of land which is 78 decimals than the Marginal farmers of the treatment group which is only 58 decimals.
Moreover, the land usage pattern is diversified. For cereal crop production the farmers are using the majority amount of the land thereafter, the vegetable production. On the other hand, land used for fish culture as well as for grazing is very low. Apart from cereal crop, vegetable, grazing, and fish production lump sum amount of land is used for other purposes.

Land usage for cereal crop production is higher in the control group when compared with the treatment group. In contrast, usage of land for vegetable production is higher in the treatment group than in the control. Consequently, the usage of land for fish culture and other purposes is higher for the treatment group. While grazing land demonstrates an equal usage for the both treatment and control group.

Figure 14. Land utilization pattern of host community in agricultural production

3.7.2. Ownership of productive assets

Around 98 percent (97 percent from the treatment and 99 percent from the control group) of households from the host community reported that they have ownership of at least one productive asset. On average, the number of productive assets owned by a household is 5 (average 5 for the treatment group and average 4 for the control group). Machete (93 percent from the treatment and 100 percent from the control group) and then Micro gardening kits (39 percent from the treatment and 33 percent from the control group) are the most possessed productive assets found in the study. Furthermore, a mentionable portion from both the control and the treatment group stated that they have their own fishing tool, sewing machine, and water pump. In contrast, very few (1 percent from the treatment group and 1 percent from the control group) households from the host community opined having ownership of power thresher. Moreover, possession of the power tiller, rickshaw, and tomtom is also very low perceived from the study.

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12 Productive asset refers to the ownership of plough, Machete/Spade, Tractor/Powertiller, Dry fish processing plant/equipments, water pump, Power thresher, Fishing tools/equipments, Rickshaw/van, Tomtom, Sewing machine and CNG by the households.
In the FDMN community, 64 percent (94 percent from the treatment and 34 percent from the control group) of households responded that they own at least one type of productive asset. The mostly owned productive asset by the FDMN treatment group is the Micro gardening kit which is owned by 87 percent of households. On the other hand, machete is the mostly owned productive asset by the households (32 percent) of the control group. Few households (8 percent from the treatment and 4 percent from the control group) have the sewing machine. However, none of the households have ownership of the power tiller, water pump, power thresher, Rickshaw, or tomto.

### 3.7.3. Ownership of non-productive assets

All the households of the host community both from the treatment and the control have ownership of at least one non-productive asset. On average, the number of non-productive assets owned by a household is 9 (Average 10 for the treatment group and average 7 for the control group). All the respondents reported that they have either a Gas or Mud stove in their households. In addition, 99 percent of respondents in both the control and treatment groups possess a cell phone. Moreover, 83 percent of the treatment and 80 percent of the control group stated that they have at least 1 piece of jewelry made by gold in their households. On average 9.33 gm gold is owned by the households of the treatment group whereas 4.66 gm is for the control group. According to the study motor-bike (4 percent from the treatment and 3 percent from the control) is the least owned non-productive assets by the households found in the study.

In the FDMN community, all the households own at least one non-productive asset and on average the number of non-productive assets own by a household is 3 (3 for the treatment and 3 for the control group). All the respondents both from the treatment and the control group stated that they have either mud or Gas stove for cooking. Furthermore, around 82 percent of households from the treatment group and 80 percent from the control group have at least one mobile phone. Besides, 46 percent of the treatment and 42 percent of the control group reported that they have at least one

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13 Non-Productive asset refers to the ownership of Car, Bicycle, Gas/Mud stove, mobile phone, Motor bike, Jewelry (Gold/silver), Almira, Fridge by the households.
piece of jewelry made by gold. On average gold owned by the households of the treatment the group is 2.33 gm whereas it is 1.87 gm for the control group.

3.8. Social Safety Net (SSN)

3.8.1. Amount of formal transfer received

Around 33 percent (30 percent from the treatment group and 15 percent from the control group) of respondents from the host community reported that they received the formal transfer\(^\text{14}\) in the last 12 months with an average sum of BDT 3,258 (BDT 4,269 from the treatment group and 639 from the control group). Due to the COVID-19 pandemic government and also different NGOs and INGOs provided unconditional cash grant assistance in various sub-districts, particularly Ukhia and Teknaf which has been reflected in the average sum. On the other hand, almost all the respondents from the FDMN community reported of not having any formal cash transfer in the last 12 months. This is relatable to the actual field context because there is a restriction to provide unconditional cash support in the Rohingya camps.

3.8.2. Amount of in-kind transfer received

In-kind transfer includes for instance relief food, shelter, medical facilities, agricultural inputs, fuel subsidies, etc. In-kind transfers have been documented in monetary value at the time of data collection. From the analysis, it is observed that all the respondents (100 percent) both in the control and treatment group from the FDMN community have received in-kind\(^\text{15}\) support as the FDMN community is fully dependent on the in-kind support provided by different NGOs and the INGOs. The average amount of in-kind support received by the FDMN community in last year is worth BDT 78,520 (82,621 from the control and 74,419 from the intervention).

\(\text{Figure 16. Share of In-kind transfer received by the FDMN community}\)

Out of the total amount of in-kind transfers provided in the last 12 months, 74 percent was for food. Thereafter, 12 percent was provided for cooking fuel (LPG). Furthermore, 5 percent out of the total

\(^\text{14}\) Formal transfer includes the cash grant support provided by the government, NGOs, INGOs, and UN organizations.

\(^\text{15}\) In-kind transfer includes food, shelter, medical facilities, agricultural inputs, fuel subsidies, etc.
amount provided for other support like hygiene kits, and mosquito nets distribution. Following that are shelter (4 percent) and medical facilities (3 percent), and the least amount of assistance provided in agriculture input distribution which is only 1 percent.

On the other hand, the average amount of in-kind transfer received by the Host community is quite limited if compared to the FDMN community which is worth BDT 8,637 only (BDT 11,450 received by the treatment group and BDT 1,315 received by the control group). The major share of this supported amount is contributing to food assistance which is 29 percent. Then, around 17 percent amount was provided for other purposes like purchasing poultry and goat/sheep, sewing machines, etc. 16 percent was allocated for purchasing agricultural input. However, the least amount was for medical facilities which is only 2 percent.

Figure 17. Share of In-kind transfer received by the host community
3.9. Adaptive Capacity (AC)

3.9.1. Level of education

The average years of schooling\(^{16}\) for Host community is higher than the average of the FDMN community. And there is no significant difference found between treatment and the control in both the cases.

*Figure 18. Years of schooling (Average)*

<table>
<thead>
<tr>
<th>Sample type</th>
<th>Average Monthly income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment group</td>
<td>15,596</td>
</tr>
<tr>
<td>Control group</td>
<td>12,358</td>
</tr>
<tr>
<td>Total average</td>
<td>14,694</td>
</tr>
</tbody>
</table>

There is a significant gap in terms of income among different types of farmers. A noteworthy gap between income of large and marginals farmer was detected in the study. The farmers from the control group are the low-income earner across all three categories if compared with the treatment

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\(^{16}\) The average year of schooling refers to the average duration of taking formal education by the household members.

\(^{17}\) BDT 16,297 (BBS 2016)
group. Also, a significant difference has been observed in the income of large farmers when compared between treatment and the control groups.

*Figure 19. Income of host community by farmer category and sample type*

The percentage of income share shows that 49 percent of HHS’ income (47 percent of treatment group and 55 percent of control group) came from the agricultural sector while 12 percent (14 percent of treatment and 7 percent of control) came from the family business and 18 percent (16 percent from treatment and 23 percent from control) of income share came from working as day labor. Moreover, 11 percent (11 percent from treatment and 9 percent from control) of income came from other sources (i.e. foreign remittance, driving light motorized vehicles such as tomtom, auto-rickshaw, income from leasing own land and house rent, etc. The study found many marginal farmers were occupied with day laborers, especially off-season/lean period.

*Table 4. Income share of the host community from different sectors*

<table>
<thead>
<tr>
<th>Economic sector</th>
<th>Percentage of income share from different sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Livestock, Fishing</td>
<td>49%</td>
</tr>
<tr>
<td>Family Business</td>
<td>12%</td>
</tr>
<tr>
<td>Government Wage</td>
<td>1%</td>
</tr>
<tr>
<td>Private sector wage</td>
<td>8%</td>
</tr>
<tr>
<td>Transfers Social Assistance</td>
<td>3%</td>
</tr>
<tr>
<td>Day labor</td>
<td>18%</td>
</tr>
<tr>
<td>Other</td>
<td>11%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

The average monthly income in the FDMN community is incredibly low, at just BDT 2,436 (BDT 2,517 Treatment group and BDT 2,354 Control group). The limited income in the FDMN community can be characterized by their limited opportunity to engage in income-generating activities. The majority of the FDMN community’s income comes from day labor work, both in the treatment and control groups.
(53 percent from treatment and 51 percent from control). Around 23 percent, a noteworthy portion, stated their income comes from private sector wage\textsuperscript{18} both in the control (25 percent) and the treatment group (23 percent). Several humanitarian actors recruit Rohingya as the monthly paid volunteers and income share from the private sector reflects this.

### 3.9.3. Loan and savings

The households of the Host community have accumulated savings, on average BDT 17,265 in the last 12 months. The amount of Savings is higher in Ramu (BDT 34,759) and Cox’s Bazar Sadar (BDT 24,435) compared to other sub-districts. Around 74 percent of HHs have saved money in the treatment group while 46 percent in the control group. No significant difference was found in saving money, if it is observed disaggregating by household head sex. 66 percent of male-headed households have savings whereas 62 percent of female-headed households have access to savings. On the other hand, 42 percent households of treatment group have debt. However, debt is higher in the control group which is 69 percent.

The chart shows, the Upazila wise loan and savings comparison. The average loan and savings trend in Ukhia and Teknaf is lower than the Cox’s Bazar Sadar and Ramu sub-districts and the average loan and the savings in each sub-district were found less deviated or closer.

*Figure 20. Sub-district wise average amount of savings and remaining loan (BDT) of host community*

![Chart showing loan and savings comparison](chart.png)

### 3.9.4. Vegetable and cereal crops produced by the households

The analysis revealed that on an average 6 types of agricultural products (vegetable and cereal crop) are produced by the treated households of Host community whereas 5 types of products are produced by the households of the control group. The analysis also traced the percentage of different vegetables and cereal crops cultivated by the households which give a scenario of the prevalence of different items produced by the households in this context. Aman is the most cultivated crop by the households both in the intervention (57 percent) and the control group (75 percent). However, Potato and sweet potato is the second most cultivated crop (46 percent) by the households of the treatment group, but it is ranked in the third position (40 percent) for the control group. The second most practiced crop for the control group is Boro which is 60 percent. In contrast, limited practice of cultivating tobacco (2

\textsuperscript{18} Several humanitarian actors recruit Rohingyas as monthly paid volunteers
percent) is observed among the treatment group but in the control group, practice is bit higher (18 percent). On the other hand, Ridge gourd is the least cultivated crop (7 percent) for the control group but around 11 percent of households cultivate ridge gourd in the treatment group. A comparison is shown in the graph below.

Figure 21. Vegetable and cereal crops cultivated by the households of host community

A different scenario perceived in the FDMN community. Due to lack of available land, there is no cultivation of cereal crops like Aman and Boro among the FDMN group. Instead, they produce the vegetables most in their homestead. On average, 2 types of vegetables are produced by the FDMN community. Sweet gourd (67 percent) and bottle gourd (67 percent) are the most cultivated vegetable by the households of the FDMN community. Furthermore, Cucumber (57 percent) and Yard long bean (54 percent) are the most cultivated vegetables there. Nonetheless, bitter gourd is the least (13 percent) cultivated vegetable in the FDMN community.
5.9.7. Technology adoption in agricultural production
Usage of technology usually helps to boost production. It is found from the study that around 16 percent of households (19 percent from treatment and 6 percent from control) from the Host community use technologies in homestead gardening like integrated pest control (bio-pesticides), conservation agriculture (vermicompost), and Climate smart agriculture practice (sack gardening). Furthermore, around 23 percent of households (29 percent from treatment and 21 percent from control) reported their usage of technology in cereal crop production. The most used technology in cereal crop production is conservation agriculture practice - mulching, perching, vermicompost, and line sowing. Few households which are around 3 percent (4 percent from treatment and 1 percent from control) said that they use technology like Supplementary fish feed, Testing water by pH meter, and dolomite in fish culture.

In the case of the FDMN community, usage of technology is mostly seen in homestead gardening which is around 32 percent (63 percent from treatment and 0 percent from control). The most used technology in the homestead of camps is conservation agriculture practice - sex pheromone trap and climate smart agriculture practice- sack gardening.

3.9.5. Storage of crop for the lean period
Rural families in agriculture-based economies often experience seasonal hunger and extreme poverty each year during the lean season between planting and harvest, when food prices go up and jobs become scarce. To cope with this type of situation each household keeps some storage of food like rice, potato, dry chili, and few other items. The analytics found that around 69% of households from the Host community saved at least one item to cope with the lean period. The foremost item for storage is rice. On an average 348 Kg of rice (476 kg from the control and 299 kg from the treatment group) are stored by the households. The respondents also noted that they stored potato and dry chili considering the lean period and the average amount of potato saved for the lean period is 11 Kg and Dry chili is 4 Kg. Apart from dry chili some other products like bean seed, turmeric, onion, and garlic are also stored for the lean period.

On the other hand, due to the lack of space and scope, the production of the FDMN community is too limited to save for the lean period. In addition, the FDMN community is fully dependent on assistance to meet their need for food and other basic services. Therefore, there is a very limited scope to make
storage of food for the lean period. The same scenario is reflected in the study. Only 1 percent of households from the FDMN treatment group have storage to cope with the lean period.

3.9.6. Market linkage
The study identified the market linkage status of the surveyed respondents. As most of the respondents are involved in agricultural production so the prime concern was to know whether the respondents are connected with the market to sell their agricultural products or not. The analysis indicates that 97 percent of respondents from Host community (96 percent from the control group and 97 percent from the treatment group) are connected with the market to sell their agricultural products. Moreover, the research reveals that on average, each respondent in both the control and treatment groups is connected with at least two types of marketplaces. The majority of them (91 percent) mentioned being connected with the local market. Furthermore, around 39 percent stated that they are connected with the market through intermediators. Some farmers denoted that they are connected with sub-district, regional and district markets.

On the other hand, because they carry out their agricultural operations in a relatively small area, the FDMN community’s production is too little to be sold in the market. The study found only 5 percent of respondents from the treatment group are connected with market such as the WFP-supported market in the camp and local retailers. No market linkage between the respondents from the control group has been found in the analysis.

3.10. Food consumption and coping
3.10.1. Food consumption
More than two-thirds (69 percent) of the Host community households both from the treatment and the control within the surveyed sub-districts are in an acceptable food consumption pattern. The rest one-third are facing inadequate (poor or borderline) food consumption in their daily life. Among these one-third around 5 percent of households fall under the poor consumption category. In contrast, around half of the Rohingya households were found with acceptable food consumption pattern. Among the remaining half, around 6 percent (6 percent from the intervention and 7 percent from the control group) of the households have poor consumption and 44 percent (40 percent from the treatment and 48 percent from the control group) have borderline consumption. The male-headed households are experiencing a better consumption pattern than the female-headed households in both the host and the refugee community. In the host community, 70 percent of male-headed households reported having adequate food consumption whereas, it is only 42 percent in female-headed households. On the other hand, 54 percent of Rohingya male-led households reported having adequate food consumption. In contrast, only 35 percent of female-led households reported an acceptable food consumption pattern.
Figure 23. Food consumption score by host vs FDMN community

The average Household Dietary Diversity Score (HDDS)\(^{19}\) of the Host community is higher than the FDMN community. The average household dietary diversity score (HDDS) of the Host community is 5 whereas, it is 4 for the FDMN community. It refers that on average 5 types of food has been consumed by the households of the host community in last 24 hours and 4 types of food consumed by the households of the FDMN community.

3.10.2. Coping mechanism

3.10.2.1. Livelihood based coping strategy

Livelihood Coping Strategy Index (LCSI)\(^{20}\) is measured to see the extent to which households are resorting to unsustainable changes in their typical livelihood (i.e. coping strategies) in order to decrease food (or essential needs) gaps. Slightly more than one-third (39 percent) of the Host community (41 percent from the treatment group and 35 percent from the control group) have to follow at least one crisis or emergency strategy while 40 percent (37 percent from the treatment and 50 percent from the control group) adopt a stress strategy. However, no coping strategy is followed by 21 percent of households (23 percent from the treatment and 15 percent from the control group).

On the other hand, more than two-thirds (67 percent) of the households both from the treatment and the control group in the FDMN community follow at least one crisis or emergency strategy. Besides, 22 percent of households (23 percent from the treatment and 21 percent from the control group)

---

\(^{19}\) HDDS is a qualitative measure of the food consumption that reflects households’ access to a variety of food group in 24 hour recall period. The food groups are Cereals, White tubers and roots, vegetables, Fruits, Meat, Eggs, Fish and other sea foods, Legumes, nuts and seeds, Milk and milk products, oils and fats, sweets, species condiments and beverage.

\(^{20}\) The livelihoods-based coping strategies module is used to better understand longer-term coping capacity of households. The module must include four stress strategies, three crisis strategies and three emergency strategies. **Stress strategies** indicate a reduced ability to deal with future shocks as the result of a current reduction in resources or increase in debts. **Crisis strategies** are often associated with the direct reduction of future productivity. **Emergency strategies** also affect future productivity, but are more difficult to reverse or more dramatic in nature than crisis strategies.
follow a stress strategy while 11 percent of households (11 percent from the treatment and 12 percent from the control group) does not apply any coping strategy.

*Figure 24. Livelihood coping strategy by host vs FDMN community.*

Buying Food on credit is the stress managing strategy that is most frequently used by both the host community and the FDMN community. Around 58 percent households from the host and 39 percent households from the FDMN community follow this coping strategy. On the other hand, the most adopted crisis strategy by the households of the host community is reducing non-food expense which is followed by 26 percent households. However, in the FDMN community selling, sharing or exchanging food assistance is the most adopted crisis strategy which is followed by 38 percent households. Very few households (2 percent) stated that their children have to work for long hour which is the mostly followed emergency coping strategy by the households of the host community. In contrast, the most common emergency livelihood coping strategy used by 3 percent of households in the FDMN community was to get their child married.
3.10.2.2. Consumption-based coping strategy

Overall 58 percent of Host community households (55 percent from treatment and 65 percent from control) from five sub-districts and 80 percent (77 percent from the treatment and 82 percent from control) of households from the FDMN community adopted at least one coping strategy in the last seven days to cope with the lack of food. Also, it is observed that the percentage of following coping strategies in the female-headed household is higher (67 percent) than in the male-led households (57 percent). The same scenario is found in the FDMN community as well. 82 percent of female-led households are following at least one coping strategy whereas the prevalence for the male-led households is 79 percent.

Figure 26. Consumption-based coping strategy by nationality

Around half (58 percent) of the Host community relied on less preferred and expensive food whereas more than two-thirds (69 percent) of the FDMN community follow this coping strategy for at least one
day. Around 27 percent of the respondents from Host community and 36 percent from the FDMN community borrowed food or relied on assistance during the week of data collection. Whereas, the prevalence of reducing the number of meals for at least one day is the same (15 percent) for both host and FDMN communities. Besides, 12 percent of Host community and 21 percent of the FDMN respondents reported that they had to reduce the size of meals to cope with the lack of food. Few (7 percent from host, 9 percent from FDMN) reported that the adult person of the households restricts their consumption to feed their young children.

3.11. Shocks faced by the households

Around 95 percent of households (96 percent from the treatment and 94 percent from the control) from the host community reported that they faced at least one shock, for instance, the Impact of COVID-19 on income/livelihood, monsoon flood, flash flood, plant or animal diseases, etc in last 12 months. The most prevalent shock faced by the households from the host community is COVID-19. Around 90 percent (90 percent from treatment and 90 percent from control) of the respondents especially Cox’s Bazar Sadar sub-district from the treatment group and Ukhia sub-district from the control group mentioned that COVID-19 affected their livelihood a lot. The second most prevalent shock was the monsoon flood. More than one-third of the households (69 percent) especially the household of Ramu sub-district from the treatment group and Chakaria sub-district from the control group pronounced that they were affected by monsoon floods in the past year. Apart from these, few households were affected by flash flood, landslide, and plant or animal diseases.

On the other hand, 86 percent respondents both from the treatment and the control of the FDMN community reported that they faced at least one shock in the last 12 months. The pandemic of COVID-19 is also the most common shock in this area. Around 86 percent remarked that the COVID-19 pandemic made an adverse impact on their daily life. Apart from COVID-19, 1 percent households both in control and treatment reported of being affected by landslide in past 12 months.
4. RECOMMENDATION

4.1. Recommendations for the host community
Asset (AST) ownership and Adaptive Capacity (AC) are the most significant contributors to the resilience capacity of the host community households. That is, interventions designed to increase the host community’s adaptive capacity and asset ownership will better boost their resilience capacity. Enhancing adaptive capacity can be complemented by facilitating the usage of technology in agricultural production, access to savings and loan. Besides, Better access to asset ownership can be complemented by increased access to land properties, productive and non-productive assets. Attention needs to be drawn especially to Ukhia and Teknaf sub-district. Better storage of crops for the lean period, increased usage of technology in agricultural production, enhanced access to land, savings, productive, and non-productive assets should be prioritized for the reinforcement of AST and AC pillars in these two sub-districts. Marginal farmers as well as the households headed by females should be prioritized when designing any development intervention. Intervention should be designed to ensure increased usage of land, input, and technology in agricultural production along with facilitating better access to savings and loans which will help to influence the resilience capacity of the marginal and female-headed households similarly.

4.2. Recommendations for the FDMN community
The households receiving agricultural support for homestead gardening were found to be more resilient than households that did not receive agricultural assistance. Therefore, agricultural support should be continued to enhance the resilience capacity of the FDMN households. The interventions can concentrate on ensuring access to the agricultural crop and input markets, which will help to strengthen access to basic services for the majority of the FDMN community. Besides, Priority should be given to the cultivation of the diversified vegetable crop, and the usage of technology in agricultural production to strengthen the Adaptive Capacity pillar.

5. CONCLUSION
The prime concern of the RIMA study is to measure resilience in a quantitative approach as well as to identify the determiners affecting the resilience capacity of the households. It has been perceived from the study that the treatment group of the host community possesses better resilience capacity than the control group. Within the treatment group, the resilience capacity of the large farmers is the highest compared to the smallholder and the marginal farmers. Moreover, male-headed households are found with higher resilience capacity than female-headed households. On the other hand, the treated FDMN community demonstrates a high resilience capacity than the control group. Besides, the resilience of the male-led households is slightly higher than the female-led households in the camp. Apart from measuring resilience, the study also identified the key variables that are triggering the resilience index. Side by side, the research depicted that one-third of households from the host community and half of the households from the FDMN community are suffering from inadequate food consumption. Moreover, a remarkable portion has to follow at least one consumption-based coping strategy as well as a livelihood-based coping strategy. Apart from these findings, the study showed a comparison of income between the control and treatment groups. Host community households from the treatment group earn more than the control group and a major share of their income come from the agricultural sector. However, in the FDMN community, the income is very limited and their major share comes from the day labor activity. The treatment group of the host community is in close proximity to basic service, posses better market linkage, higher ownership of land, and savings than the control group perceived to form the study. On the other hand, access to social safety net specially in-
kind transfer (assistance of relief food, shelter, medical facilities, agricultural inputs, fuel subsidies, etc) of FDMN households is higher than the host community households. In contrast, the host community have better access to cash grant support than the FDMN community.

All of the above findings, in particular observations related to the resilience capacity, will assist in measuring the intervention's impact on the targeted community. Additionally, it will indicate, which areas of intervention require greater emphasis, in order to increase the beneficiaries’ resilience, assisting in a more effective and efficient design of the program.
REFERENCES


ANNEXURE

Annex 1: Variables employed in the RIMA model to determine the resilience

This section presents the list of variables that were employed to measure pillars and resilience capacity for the host community and the FDMN community. Overall, the sets of variables used are similar but have small differences. The reason for this is that the host community has a different setting and context compared to the FDMN community, thus, to truly reflect their situations, different aspects were considered. For example, the key variables that are most influential or important for the host community like access to land, amount of savings, and amount of loan taken are not significant for the FDMN community. The FDMN community is not allowed to own land rather they do homestead gardening in a very small space adjacent to their temporary shelter in the camp. Besides, the FDMN community fully relies on assistance provided by different humanitarian actors. There is very limited opportunity to engage themselves in livelihood activities. As a result, their monthly earnings are very low which tends to limit access to savings and loan. Considering all these factors, the variables selected to determine the Resilience Capacity Index (RCI) of the host community are slightly different than those of the FDMN community.

Table 5. Variables employed to determine resilience

<table>
<thead>
<tr>
<th>Pillar</th>
<th>Variables</th>
<th>Definition</th>
<th>Host</th>
<th>Refugee</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access to Basic Services (ABS):</strong> The ability of a household to meet basic needs, by accessing and effectively using basic services, such as sending children to school, accessing water, electricity sanitation, public health facilities, and selling products at the market.</td>
<td>Distance to agriculture crop market</td>
<td>Variable indicating one-way walking distance in minutes to reach the market from the households where agricultural products like vegetables, cereal crops, etc are sold.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Distance to agriculture input market</td>
<td>This variable indicates the one-way walking distance in minutes to reach the market from the households where agricultural inputs like seeds, fertilizers, and pesticides are sold.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Distance to primary school</td>
<td>One-way walking distance in minutes to reach the nearby primary school.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Distance to the public health facility</td>
<td>One-way walking distance in minutes to reach the nearby public hospital.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Assets (AST):</strong> Assets, both productive and non-productive, are the key elements of a livelihood since they enable</td>
<td>Productive asset index</td>
<td>The productive asset index standardizes different types of productive assets into a single unit of measurement. The total monetary value of all productive assets has been rationed with each of the asset’s value.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Pillar</td>
<td>Variables</td>
<td>Definition</td>
<td>Host</td>
<td>Refugee</td>
</tr>
<tr>
<td>--------</td>
<td>-----------</td>
<td>------------</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>households to produce and consume goods.</td>
<td>Non-productive asset index</td>
<td>Non-Productive asset index standardizes different types of non-productive assets into a single unit of measurement. The total monetary value of all non-productive assets has been rationed with each of the asset’s value.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Land</td>
<td>Total area (hectares) employed for crop production.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Usage of input</td>
<td>Dummy variable for using inputs like vermicompost/fertilizer.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Number of poultry own</td>
<td>Number of poultry like chicken/duck/turkey owned by the households.</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Social Safety Nets (SSN): Capacity of the household to access formal and informal assistance from institutions, as well as from relatives and friends.</td>
<td>Formal transfer received</td>
<td>Total amount (USD) of formal transfers received in the last year. They include cash for work programs, unconditional cash grant support, by the government/non-governmental organizations (NGOs).</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>In-kind transfer received</td>
<td>Total amount (USD) in-kind transfer (assistance of relief food, shelter, medical facilities, agricultural inputs, fuel subsidies, etc) received in last year.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Informal transfer received</td>
<td>Total amount (USD) informal transfer (gift from relatives/neighbors) received in last year.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Can rely on, the number of people in need</td>
<td>The total number of people whom the respondents can rely on in any emergency need.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Pillar</td>
<td>Variables</td>
<td>Definition</td>
<td>Host</td>
<td>Refugee</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Adaptive Capacity (AC):</strong> Ability to adapt to a new situation and develop new livelihood strategies.</td>
<td>Saved for the lean period index</td>
<td>Saved for the lean period index standardizes different types of items saved for the lean period into a single unit of measurement.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Number of technology adopted in different agricultural sub-sectors</td>
<td>The number of technology (vermicompost, sex pheromone trap, sack gardening, etc) adopted in different agricultural sub-sectors like homestead gardening, cereal crop production, and fish culture.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Amount of savings</td>
<td>Total amount (USD) saved in last year.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Amount of loan received</td>
<td>Total amount (USD) of loan taken in last year.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Vegetable diversity</td>
<td>Type of vegetable produced in last month.</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Number of training received</td>
<td>Total number of training received in the last year.</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Food Security:</strong> According to the 1996 World Food Summit, “food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO, 1996)</td>
<td>Food consumption score (FCS)</td>
<td>FCS measures household’s access to consumption of diverse food, weighted by nutrient density. The score calculated using the frequency of consumption of different food groups consumed by a household during the 7 days before the survey.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Reduced coping strategy index (rCSI)</td>
<td>It considers both the frequency and severity of five pre-selected coping strategies that the household used in the seven days prior to the survey when they did not have enough food or money to purchase food.</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Annex 2: Resilience Structure Matrix (RSM) graphs

Figure 28. Resilience structure matrix of host community treatment group by sub-district

Figure 29. Resilience structure matrix of host community treatment group by farmer category
Figure 30. Resilience structure matrix of host community treatment group by Household head sex

Figure 31. Resilience structure matrix of host community by sample type
RESILIENCE INDEX MEASUREMENT AND ANALYSIS
COX'S BAZAR [ROUND 1]

Figure 32. Resilience structure matrix of FDMN community by sample type

Figure 33. Resilience structure matrix of FDMN community by household head sex
Figure 34. Resilience structure matrix of FDMN Vs Host community
Annex 3: Maps with Resilience Capacity Index (RCI)

Figure 35. RCI of host community intervention group by sub-district
Figure 36. RCI of host community control group by sub-district
Figure 37. RCI of FDMN intervention group by camp
Figure 38. RCI of FDMN control group by camp
### Annex 4: Data analysis tables

#### Table 6. Key findings by nationality

<table>
<thead>
<tr>
<th>Attribute / Nationality</th>
<th>Host</th>
<th>FDMN</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>5.8</td>
<td>4.8</td>
</tr>
<tr>
<td>Treatment</td>
<td>6</td>
<td>5.3</td>
</tr>
<tr>
<td>Sex of HH head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>6%</td>
<td>20%</td>
</tr>
<tr>
<td>Male</td>
<td>94%</td>
<td>80%</td>
</tr>
<tr>
<td>Years of schooling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>5.1</td>
<td>2.3</td>
</tr>
<tr>
<td>Control</td>
<td>5.1</td>
<td>2.3</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>42%</td>
<td>51%</td>
</tr>
<tr>
<td>Control</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>Average</td>
<td>41%</td>
<td>50%</td>
</tr>
<tr>
<td>RCSI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relied on less preferred/expensive food</td>
<td>54%</td>
<td>69%</td>
</tr>
<tr>
<td>Borrowed food/relied on help</td>
<td>27%</td>
<td>36%</td>
</tr>
<tr>
<td>Reduced number of meal</td>
<td>25%</td>
<td>15%</td>
</tr>
<tr>
<td>Reduced portion size of meal</td>
<td>31%</td>
<td>21%</td>
</tr>
<tr>
<td>Restrict consumption by adults/young</td>
<td>25%</td>
<td>9%</td>
</tr>
<tr>
<td>LCSI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No coping</td>
<td>21%</td>
<td>11%</td>
</tr>
<tr>
<td>Stress</td>
<td>40%</td>
<td>22%</td>
</tr>
<tr>
<td>Crisis</td>
<td>36%</td>
<td>63%</td>
</tr>
<tr>
<td>Emergency</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>FCS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable</td>
<td>69%</td>
<td>50%</td>
</tr>
<tr>
<td>Borderline</td>
<td>26%</td>
<td>44%</td>
</tr>
<tr>
<td>Poor</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Asset (AST)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average of Productive Asset Index</td>
<td>0.029</td>
<td>0.003</td>
</tr>
<tr>
<td>Average of Non-productive Asset Index</td>
<td>0.062</td>
<td>0.015</td>
</tr>
<tr>
<td>Average of Tropical Livestock Unit (composite)</td>
<td>0.943</td>
<td>0.007</td>
</tr>
<tr>
<td>Use input (Fertilizer/vermicompost) in agricultural production</td>
<td>0.886</td>
<td>0.493</td>
</tr>
<tr>
<td>Share of In-kind transfer received</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>29%</td>
<td>74%</td>
</tr>
<tr>
<td>LPG gas</td>
<td>9%</td>
<td>12%</td>
</tr>
<tr>
<td>Shelter</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Medical facilities</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Education stipend</td>
<td>7%</td>
<td>-</td>
</tr>
<tr>
<td>Old age allowance</td>
<td>6%</td>
<td>-</td>
</tr>
<tr>
<td>Agri input/Seed</td>
<td>5%</td>
<td>1%</td>
</tr>
<tr>
<td>Agri input/Feed</td>
<td>5%</td>
<td>-</td>
</tr>
<tr>
<td>Agri input/Other</td>
<td>16%</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>17%</td>
<td>5%</td>
</tr>
<tr>
<td>Income share</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sector of income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture, Livestock, Fishing</td>
<td>47%</td>
<td>55%</td>
</tr>
<tr>
<td>Family Business</td>
<td>14%</td>
<td>7%</td>
</tr>
<tr>
<td>Government Wage</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Private sector wage</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Transfers Social Assistance</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>Day Labor</td>
<td>16%</td>
<td>23%</td>
</tr>
<tr>
<td>Other</td>
<td>11%</td>
<td>9%</td>
</tr>
</tbody>
</table>
Table 7. Comparison of key findings disaggregated by nationality by sex of HH head

<table>
<thead>
<tr>
<th>Attribute / Nationality / Sex of HH head</th>
<th>Host</th>
<th>FDMN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Resilience cap. index (RCI)</td>
<td>Average of RCS</td>
<td>26</td>
</tr>
<tr>
<td>Asset (AST)</td>
<td>Average of productive asset index</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>Average of non-productive asset index</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>Use input (Fertilizer/vermicompost) in agricultural production</td>
<td>0.813</td>
</tr>
<tr>
<td></td>
<td>Average usage of land</td>
<td>0.315</td>
</tr>
<tr>
<td></td>
<td>Average of tropical livestock unit (composite)</td>
<td>-</td>
</tr>
<tr>
<td>Adaptive capacity (AC)</td>
<td>Average number of agro technology adopted (composite)</td>
<td>0.641</td>
</tr>
<tr>
<td></td>
<td>Average of amount saved during lean period (USD)</td>
<td>0.244</td>
</tr>
<tr>
<td></td>
<td>Average of amount of savings per capita (USD)</td>
<td>14.073</td>
</tr>
<tr>
<td></td>
<td>Average of amount of loan received per capita (USD)</td>
<td>66.381</td>
</tr>
<tr>
<td>Access to basic services (ABS)</td>
<td>Average distance from public health facility (min)</td>
<td>0.036</td>
</tr>
<tr>
<td></td>
<td>Average distance from primary school (min)</td>
<td>0.081</td>
</tr>
<tr>
<td></td>
<td>Average distance from agri/crop market (min)</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td>Average of distance from agri-input market (min)</td>
<td>0.036</td>
</tr>
<tr>
<td>Social safety net (SSN)</td>
<td>Amount of formal transfer received per capita (USD)</td>
<td>14.545</td>
</tr>
<tr>
<td></td>
<td>Amount of informal transfer received per capita (USD)</td>
<td>2.182</td>
</tr>
<tr>
<td></td>
<td>Amount of in-kind transfer received per capita (USD)</td>
<td>45.539</td>
</tr>
<tr>
<td></td>
<td>Average number of people to whom can rely on need</td>
<td>1.468</td>
</tr>
</tbody>
</table>

Table 8. Access to basic services and crop production stratus disaggregated by nationality and comparison groups

<table>
<thead>
<tr>
<th>Attribute / Type of Sample</th>
<th>Host</th>
<th>FDMN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment</td>
<td>Control</td>
</tr>
<tr>
<td>Distance from basic services (min)</td>
<td>Primary school</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Public hospital</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Public means of transport</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Agriculture crop market</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Agriculture input market</td>
<td>40</td>
</tr>
<tr>
<td>Production of vegetables and cereal crops</td>
<td>Bitter gourd</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Bottle gourd</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Country bean</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>Cucumber</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>Leafy vegetable</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>Sweet gourd</td>
<td>34%</td>
</tr>
<tr>
<td></td>
<td>Yard long bean</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>Bean seed</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>Brinjal</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>Chili</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>Okra</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Radish</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>Ridge gourd</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Snake gourd</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Tomato</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Aman</td>
<td>57%</td>
</tr>
<tr>
<td></td>
<td>Boro</td>
<td>39%</td>
</tr>
<tr>
<td></td>
<td>Potato</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>Tobacco</td>
<td>2%</td>
</tr>
</tbody>
</table>
Table 9. Key agriculture and shock related findings from host community disaggregated by comparison groups

<table>
<thead>
<tr>
<th>Attribute / Type of Sample</th>
<th>Treatment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monthly income (BDT)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>15,596</td>
<td>12,358</td>
</tr>
<tr>
<td>Large</td>
<td>29,658</td>
<td>17,088</td>
</tr>
<tr>
<td>Small</td>
<td>17,274</td>
<td>12,927</td>
</tr>
<tr>
<td>Marginal</td>
<td>11,714</td>
<td>10,210</td>
</tr>
<tr>
<td><strong>Total Average</strong></td>
<td>15,596</td>
<td>12,358</td>
</tr>
<tr>
<td><strong>Amount of land utilized (dec)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td>415</td>
<td>351</td>
</tr>
<tr>
<td>Small</td>
<td>194</td>
<td>175</td>
</tr>
<tr>
<td>Marginal</td>
<td>58</td>
<td>78</td>
</tr>
<tr>
<td><strong>Land utilization pattern</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable</td>
<td>27%</td>
<td>24%</td>
</tr>
<tr>
<td>Cereal crop</td>
<td>55%</td>
<td>63%</td>
</tr>
<tr>
<td>Fish culture</td>
<td>7%</td>
<td>3%</td>
</tr>
<tr>
<td>Grazing land</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Shocks faced in last one year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COVID-19</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>Monsoon flood</td>
<td>71%</td>
<td>62%</td>
</tr>
<tr>
<td>Flash flood</td>
<td>20%</td>
<td>18%</td>
</tr>
<tr>
<td>Landslide</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Plant or animal diseases</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Table 10. Comparison of key findings between host community counterfactual groups by upazila

<table>
<thead>
<tr>
<th>Attribute / Sub district (Upazila)</th>
<th>Cox’s Bazar Sadar</th>
<th>Ramu</th>
<th>Teknaf</th>
<th>Ukhia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Loan &amp; savings</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average amount of savings (BDT)</td>
<td>24,435</td>
<td>34,759</td>
<td>6,205</td>
<td>8,596</td>
</tr>
<tr>
<td>Remaining loan (BDT)</td>
<td>30,768</td>
<td>44,089</td>
<td>15,978</td>
<td>24,487</td>
</tr>
<tr>
<td><strong>Adaptive capacity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average of Amount Saved during Lean Period (USD)</td>
<td>0.89</td>
<td>0.43</td>
<td>0.50</td>
<td>0.39</td>
</tr>
<tr>
<td>Average of Amount of Savings per Capita (USD)</td>
<td>22.69</td>
<td>30.09</td>
<td>11.50</td>
<td>12.42</td>
</tr>
<tr>
<td>Average of Amount of Loan Received per capita (USD)</td>
<td>105.28</td>
<td>112.14</td>
<td>32.07</td>
<td>56.81</td>
</tr>
<tr>
<td>Average Number of Agro Technology Adopted (composite)</td>
<td>0.74</td>
<td>1.00</td>
<td>0.58</td>
<td>0.60</td>
</tr>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average of Productive Asset Index</td>
<td>0.06</td>
<td>0.04</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Average of Non-productive Asset Index</td>
<td>0.10</td>
<td>0.09</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Use input (Fertilizer/vermicompost) in agricultural production</td>
<td>0.93</td>
<td>0.84</td>
<td>0.84</td>
<td>0.81</td>
</tr>
<tr>
<td>Average usage of land</td>
<td>0.61</td>
<td>0.99</td>
<td>0.35</td>
<td>0.39</td>
</tr>
<tr>
<td><strong>RCS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average of RCS</td>
<td>44.00</td>
<td>45.00</td>
<td>29.20</td>
<td>30.30</td>
</tr>
</tbody>
</table>