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ii) Indicator Based Performance Assessment:

Using the **Programme Results Framework from the Project Document / AWP** - provide an update on the achievement of indicators at both the output and outcome level in the table below. Where it has not been possible to collect data on indicators, clear explanation should be given explaining why, as well as plans on how and when this data will be collected.

	<u>Achieved</u> Indicator Targets	Reasons for Variance with Planned Target (if any)	Source of Verification
Strategic Priority 1: Access to Cleaner Energy			
<i>Outcome 1: Targeted households have safe and sufficient access to cleaner cooking energy to meet their basic needs</i>			
Outcome 1a¹ Indicator: % of households who report buying or collecting firewood Baseline: 32% buy firewood 12% collect firewood Planned Target: No increase in firewood use	23% of refugees report to use firewood as a complement to LPG (ISNA) 29% buying firewood and 12% collecting firewood (2024 evaluation)	It should be noted that the indicator does not quantify firewood use, and the ISNA did not ask for the amount of firewood used by the 23% who use firewood as a complement to LPG. The preliminary 2024 annual evaluation reported 29% buying firewood and 12% collecting firewood.	Intersector Needs Assessment (ISNA) Preliminary results of the 2024 annual evaluation
Outcome 1b Indicator: # equivalent hectares natural forest protected Baseline: 10,700 ha Planned Target: 10,700 ha	14,539.7 ha not natural forest protected		Preliminary results of the 2024 annual evaluation
Outcome 1c Indicator: # tones carbon dioxide emissions abated Baseline: # 655,000.00 annually (using J-MSNA/ REVA baseline data) # 407,000 annually (using Stanford University/ ICDDR baseline data) Planned Target: 655,000 annually	376,822 metric tonnes of CO2	The results are calculated based on the methodology used by the Stanford/ICDDR baseline of 407,000 tonnes annually to provide comparability. Since LPG is received by virtually all refugees, the difference compared to the baseline is based on changes in household numbers from the initial study (211,382) to the end of 2024 (195,713).	Stanford baseline calculation

¹ Note: Outcomes, outputs, indicators and targets should be **as outlined in the Project Document** so that you report on your **actual achievements against planned targets**. Add rows as required for Outcome 2, 3 etc.

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Output 1.1a: Refugee households have continual safe access to cleaner cooking fuel (LPG) Indicator 1.1a: % of households that have safe (LPG) and sufficient (continual) access to cooking energy Baseline: 98% Planned Target: 100%	99% of households have received LPG assistance in 2024.	The ISNA question: Have you had a refill of your LPG in the last 3 months? The preliminary 2024 annual evaluation reported 99.6% of surveyed households received LPG.	ISNA 2024 Preliminary results of the 2024 annual evaluation
Indicator 1.1.1: # of LPG refills distributed to refugee households Baseline: 10.42 (12kg) refills per household per year – for both IOM and UNHCR Planned Target: Overall target: #6,357,492 refills for the entire programme’s implementation period as per the SAFE+2 results chain. Overall target: # 1,655,224 as per GAC’s detailed budget sheet.	IOM: 560,759 UNHCR: 428,252 Total: 989,011 (2022-2023: Total: 694,013)	Only SAFE+2 funding allocated to this activity is considered. Refills have been calculated by dividing the SAFE+2 funding allocations for this output for the current reporting period with the average unit cost of refills. Only the reporting period is measured, with consideration for the SAFE+2 funding allocated to this activity. In total, both partners provided in Cox’s Bazar 1,777,331 LPG refills in 2024.	LPG distribution reports
Indicator 1.1.2: # of LPG refills distributed to refugee households (disaggregated by vulnerable groups) Baseline: 100% LPG provision to vulnerable groups Planned Target: 100% of vulnerable population covered	Total provided: To female HH (30.29%): 299,571 To male HH (69.71%): 689,440 UNHCR: Total: 428,252 To elderly: 89,933 To PwD: 12,848 IOM: Total: 560,759 To elderly: 117,759 To PwD: 16,823 99% of total (vulnerable) population received LPG refills	99% of the vulnerable population have received LPG assistance. The remaining 1% may be due to occasional changes in family size and registration litigation matters. The number of elderly and PwD refers to households with at least one elderly person or a person living with a disability.	UNHCR registration data LPG distribution reports

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Output 1.2: Targeted households have access to energy-efficient, reliable, and modern cooking equipment. Indicator 1.2a: % of households that have stoves with an efficiency level of at least 55% Baseline: N/A Planned Target: 100%	The activity was not funded through SAFE+2.	Both UNHCR and IOM stoves all have over 55% efficiency rating. All households have cooking stoves with an efficiency level of at least 55%. This has been ensured through regular checks by community mobilizers at the field level. Cooking stoves were distributed before the start of SAFE+2 and repair facilities are available for maintenance. 99% in UNHCR's PDM report confirm that their cooking stove is functional. IOM has repaired 6,456 stoves throughout 2024.	PDM reports UNHCR LPG in situ inspection reports for 2024.
Indicator 1.2.1: # households that receive first-time or replacement stoves and training Baseline: N/A Planned Target: N/A	The activity was not funded through SAFE+2.	All registered households have received a stove. Both agencies have previously provided energy efficient stoves to all households before SAFE+2 started, yet families who newly reallocated to a camp occasionally received new sets.	Distribution reports PDMs
Indicator 1.2.2: # households that receive pressure cookers and training Baseline: 400 Planned Target: All households (189,834 on 31 Dec 2022) in Cox's Bazar	The activity was not funded through SAFE+2 IOM: 10,875 UNHCR: 700 Total: 11,575 <i>(2022-2023: 91,028 pressure cookers)</i>	All pressure cookers were funded outside of the SAFE+2 program. In 2024, UNHCR replenished 700 pressure cookers for new families or to replace lost ones. IOM started pressure cooker distributions in 2024 and distributed 10,875 PCs. Distributions will continue in 2025.	UNHCR distribution reports IOM distribution reports
Indicator 1.2.3: # households that receive replacement LPG cylinders Baseline: All registered households (on 31 Dec 2022: 189,834) Planned Target: All registered households (on 31 Dec 2024: 195,713)	All registered households (195,713 on 31 Dec 2024) <i>(2023: 194,937)</i>	Prior to the SAFE+2 Programme all registered households received a replacement LPG cylinder. IOM and UNHCR distribute LPG cylinders for new households or replace lost LPG cylinders. In 2024, UNHCR distributed 3,752 LPG sets to beneficiaries and IOM distributed 2,199 LPG sets throughout 2024.	Distribution reports

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Output 1.3: Energy needs and alternatives are assessed Indicator 1.3.1: # energy studies completed Baseline: 0 Planned Target: One (1) energy study is funded under GAC's detailed budget.	Result will be achieved in first quarter of 2025	FAO conducted a household survey and market research to identify current utilization of fuel and cooking equipment in both Host and Rohingya communities and to understand the availability and price of fuels and utensils in the local market. The next step is to conduct lab tests, identification and piloting of the alternative energy source of LPG for cooking. Then finally come up with a recommendation of safe, affordable and efficient alternative sources of LPG which will be done by 1st quarter of 2025.	Study report
Indicator 1.3.2: # post-distribution monitoring analysis reports and assessments completed Baseline: 0 Planned Target: 7 indicated in the results framework	The activity was not funded through SAFE+2 <i>(2022: 1 PDM by IOM and one LPG usage assessment by UNHCR)</i>	UNHCR and IOM are conducting regular multisectoral PDMs that are not funded through SAFE+2.	PDM reports
Strategic Priority 2: Environment and Ecosystems			
<i>Outcome 2: Environment and ecosystems rehabilitated to strengthen community resilience to mitigate conflict over natural resources, disasters, and climate shocks.</i>			
Outcome 2a Indicator: % of land/ ecosystems rehabilitated in Cox's Bazar through Programme interventions Baseline: 0 Planned Target: 640 ha	107 % <i>From 2022 to 2024 683.4 ha of forest has been planted, 578 ha in 2024.</i>	The achievement is calculated as hectares of revegetated land compared to the baseline (640 ha), i.e., 73.4 ha (achievement 2023) + 32ha (achievement 2022) = 105.4 ha. In 2024, 578 ha of forest has been planted.	GIS plantation maps, sport visit reports, plantation database, preliminary result of 2024 SAFE+2 annual evaluation report.
Outcome 2b Indicator: tones carbon dioxide sequestered through Programme interventions Baseline: 0 Planned Target: 28,567 (CO2) 77,791 tons (Carbon)	7,037 tons (carbon), 25,802 (CO2) <i>(2022-2023: 1,283 tons carbon, 4704 carbon dioxide)</i>	While sequestration is measured in carbon the objective of the outcome is to remove CO2 from the atmosphere. Therefore, the amount of carbon and CO2 are reported with a conversion rate of 3.67. In 2024, 25,802 tons carbon dioxide sequestered through 578 ha of planted forest. 4,704-tons carbon dioxide sequestered by 105.4 ha of planted forest in 2023 and 2022.	GIS plantation maps Bangladesh forest inventory 2021
Outcome 2c			

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Indicator: resilience capacity score increased (compared to baseline) Baseline: 31 Planned Target: 45	42 (2023: 39)	The achieved target is from RIMA 3 published in 2024.	RIMA round 3 report
Output 2.1: Environmental and socio-ecological knowledge is managed			
Output 2.1.1: Design, implement and provide technical support for multi-sectoral monitoring platform for environmental and socio-ecological assessments Indicator 2.1.1.1: # monitoring platforms operationalized Baseline: 0 Planned Target: One (1) captured in the GAC budget.	0	FAO is about to finalize the Terms of Reference (ToR) to hire a partner to implement this activity.	Monitoring platform
Indicator 2.1.1.2: # training/workshop conducted Baseline: 0 Planned Target: Nine (9) captured in the GAC budget.	0	FAO is about to finalize the Terms of Reference (ToR) to hire a partner to implement this activity.	Training report
Output 2.1.2: Undertake environmental and socio-ecological baseline and/or monitoring assessments Indicator 2.1.2.1: # environmental and socio-ecological assessments Baseline: 0 Planned Target: Two (2) captured in the GAC budget.	0	The survey tool for the assessment was finalized in 2024. Finalization of the report is underway.	Assessment report
Indicator 2.1.2.2: # reports published Baseline: 0 Planned Target: 2	0	Finalization of the report is underway.	Assessment report
Output 2.1.3: Develop and update environmental and watershed			

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management plans using participatory planning at territorial level Indicator 2.1.3.1: # management plans developed or updated Baseline: 0 Planned Target: Two (2) captured in the GAC budget.	0	Two watersheds were selected to prepare the watershed management plan. The preparatory work to produce the plan, such as assessing the biophysical state of the selected watersheds, preparing land use and land cover maps, and conducting water quality testing, has been completed. The management plan will be finalized soon.	Watershed management plan
Output 2.2: Watersheds managed, and ecosystems are rehabilitated			
Output 2.2.1: Environment rehabilitation and eco-DRR projects - detailed designs Indicator 2.2.1: # of detailed environmental project designs Baseline: 2 Planned Target: 64	310 (locations)	FAO implemented plantation interventions at slope stabilization (166 locations), riparian rehabilitation (14 locations) and roadside plantation interventions (130 locations) considering both host and Rohingya camp.	GIS plantation map, spot visits
Indicator 2.2.2.1: # ha revegetated land Baseline: 0 Planned Target: Two hundred (200) hectares captured in GAC's detailed budget overview.	578 ha (2022-2023: 105.4 ha by FAO)	In total 683 ha is reforested from 2022 to 2024. Target achieved.	GIS plantation map, spot visit report
Indicator 2.2.2.2: # ha slope revegetated Baseline: 56 ha Planned Target: 84 ha	219.4 ha	FAO, in collaboration with WFP, IOM, and BFD, completed 219.4 hectares of slope plantation in 2024. In 2022 and 2023, 61.6 hectares were planted. In total, 281 hectares of slope plantation were done to stabilize the degraded slope lands.	GIS plantation map, spot visit report
Indicator 2.2.2.3: # km streambank rehabilitated and maintained Baseline: 0 Planned Target: 17 km captured in GAC's detailed budget overview.	39.3 km (2022: 20 ha by FAO 2023: 19.3km by FAO)	FAO, in collaboration with WFP, IOM, and BFD, completed 39.3 km of streambank rehabilitation in 2024. In 2022 and 2023, 19.3 km were rehabilitated. In total, 58.6 km of	GIS plantation map, spot visit report

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		streambank rehabilitation was completed from 2022 to 2024.	
Indicator 2.2.2.4: # km roadside planted and maintained Baseline: 0 Planned Target: 61 km	50.3 km <i>(2022 – 2023: 3.8 km)</i>	FAO, in collaboration with BFD, completed 50.3 km of roadside plantation in 2024. In 2022 and 2023, 3.8 km were planted. In total, 54.1 km were planted from 2022 to 2024.	GIS plantation map, spot visit report
Output 2.2.3: Environment rehabilitation and eco-DRR projects - implementation and construction Indicator 2.2.3.1: # stream catchments under active management Baseline: 3 Planned Target: 12	N/A	Activity not funded through SAFE+2	
Indicator 2.2.3.2: # ha slope stabilized Baseline: 56 ha Planned Target: 89 ha	N/A	Activity not funded through SAFE+2	
Indicator 2.2.3.3: # km drainage improved Baseline: 163.5 km Planned Target: 383 km	N/A	Activity not funded through SAFE+2	
Indicator 2.2.3.4: # silt traps established and maintained Baseline: 20 Planned Target: 52	N/A	Activity not funded through SAFE+2	
Indicator 2.2.3.5: # water reservoirs established and maintained Baseline: 0.64 ha Planned Target: 43.48 ha	N/A	Activity not funded through SAFE+2	
Indicator 2.2.3.6: # km walkways established Baseline: TBD	N/A	Activity not funded through SAFE+2	

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Planned Target:			
Output 2.2.4: Environment rehabilitation and eco-DRR projects - Cash for Work for watershed management and environmental rehabilitation activities Indicator 2.2.4.1: # person-days Cash for Work Baseline: 0 Planned Target: 115,087, target under GAC funding	A total of 5,244 unique beneficiaries worked in CfW activities in 2024 totaling 234,564 person days <i>(2022-2023: 4,562 person days)</i>		Attendance tracking through WFP MoDA platform.
Indicator 2.2.4.2: # person-days Cash for workers provided with equipment Baseline: 0 Planned Target: 115,087, target under GAC funding	A total of 5,244 unique beneficiaries worked in CfW activities in 2024 totaling 234,564 person days <i>(2022-2023: 176 person days)</i>		Attendance tracking through WFP MoDA platform
Output 2.2.5: Enhance local/indigenous seed production through the establishment seed orchards of threatened and endangered tree species Indicator 2.2.5.1: # ha seed orchards established and maintained Baseline: 0 Planned Target: 100 ha	10 ha	Ten hectares of seed orchard were established and maintained in collaboration with BFD until 2024. The target will be achieved within the project duration.	GIS plantation map, spot visit report
Output 2.3: Community capacity to manage conflicts over natural resources is strengthened			
Output 2.3a: Community capacity to manage conflicts over natural resources is strengthened Indicator 2.2.5.1: % of conflicts over natural resources successfully managed Baseline: 0 Planned Target: 100%	65 %		Preliminary results from the Safe+2 midterm evaluation result

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Output 2.3.1: Strengthen community co-management approach to support forest -dependent households to deal with conflicts over natural resources including Human-Elephant Conflict, snake rescue and others as identified in the conflict dynamics assessment. Indicator 2.3.1.1: # households supported with training, logistics and inputs for conflict resolution Baseline: 320 Planned Target: 1,500 households under the GAC budget	1,400 households	The activity continues in 2025.	Distribution master roll
Indicator 2.3.1.2: # elephant watchtowers maintained Baseline: 99 Planned Target: 114	N/A	Activity not funded through SAFE+2	
Indicator 2.3.1.3: # Elephant Response Teams (ERTs) supported with training, logistics and equipment Baseline: 105 Planned Target: 119	0	The activity continues in 2025.	Distribution master roll
Indicator 2.3.1.4: #person-days incentives for ERT volunteers Baseline: 86,870 Planned Target: 86,870	N/A	Activity not funded through SAFE+2	
Indicator 2.3.1.5: #wildlife centres supported Baseline: 0 Planned Target: 1	0	The activity continues in 2025.	

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Output 2.3.2: Capacitate landslide vulnerable households for disaster preparedness and promote Agricultural Hazard and Vulnerability Mapping Analysis (AHVMA) tools to enhance agriculture and climate resilience Indicator 2.3.2.1: # households supported Baseline: 0 Planned Target: 500 in the results chain	0	FAO is about to finalize the Terms of Reference (ToR) to hire a partner to implement this activity.	Training participant list
Indicator 2.3.1.2: # AHVMA tool updated Baseline: 0 Planned Target: One (1) under the GAC budget.	0	FAO is about to finalize the Terms of Reference (ToR) to hire a partner to implement this activity.	AHVMA online tool
Output 2.3.3: Develop communications strategy to raise community awareness on the protection of wildlife and natural resources including preparation and dissemination of communication and IEC materials Indicator 2.3.3.1: communication strategy developed (yes/no) Baseline: 0 Planned Target: One (1) in the results chain	0	The activity continues in 2025.	IEC material
Indicator 2.3.1.2: # # communication materials developed and disseminated Baseline: 4 Planned Target: Six (6) in the results chain	0	The activity continues in 2025.	IEC material
Output 2.3.4: Promote renewable energy technology in farmer communities Indicator 2.3.4.1: # households supported with renewable energy technology	0	40 households supported till 2023. The target will be achieved within the project duration.	Service tracking register

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Baseline: 0 Planned Target: Two hundred (200) under the GAC funding	(2022-2023: 40 households)		
Output 2.3.5: Provide capacity development and logistics support to private, partner and government owned nurseries and workers Indicator 2.3.5.1: # nurseries supported (disaggregated by type) Baseline: 0 Planned Target: Fifty (50) under the GAC funding	0 (2022-2023: 8)	FAO is working through its implementing partner to achieve the target. A capacity gap and training needs assessment was conducted to identify 50 nurseries for support. The target will be achieved within the project duration.	Distribution reports
Indicator 2.3.5.2: # tree seedlings produced Baseline: 0 Planned Target: The target will be determined based on the reconnaissance of the nurseries after onboarding of partner.	0	FAO is working through its implementing partner to achieve the target. The target will be achieved within the project duration.	Nursery assessment report
Indicator 2.3.5.3: # permanent nurseries established/rehabilitated Baseline: 0 Planned Target: 4	0	The target will be achieved within the project duration.	List of nurseries gone through rehabilitation.
Indicator 2.3.5.4: # grass slips produced Baseline: 0 Planned Target: The target will be determined based on the reconnaissance of the nurseries after onboarding of partner.	0	FAO is working through its implementing partner to achieve the target. The target will be achieved within the project duration.	Nursery assessment report
Indicator 2.3.5.5: # bamboo plantlets produced Baseline: 0 Planned Target: The target will be determined based on the reconnaissance of the nurseries after onboarding of partner.	0	FAO is working through its implementing partner to achieve the target. The target will be achieved within the project duration.	Nursery assessment report
Indicator 2.3.5.6: # households supported (disaggregated by vulnerable groups)			Nursery owner list.

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Baseline: 0 Planned Target: 40	0	FAO is working through its implementing partner to achieve the target. The target will be achieved within the project duration.	
Output 2.3.6: Youth engagement in environmental conservation activities supported with trainings on project design, M&E, advocacy, organizational management, and inputs support. Indicator 2.3.6.1: # youth engaged in environmental conservation Baseline: 100 in result chain Planned Target: Five hundred (500) in result chain	0	FAO is working through its implementing partner to achieve the target. The target will be achieved within the project duration.	Training participant list
Strategic Priority 3 – Resilience			
<i>Outcome 3A: The resilience of vulnerable host communities, especially women is sustained</i>			
Outcome 3A.1 Indicator: Resilience capacity score increased (compared to baseline) Baseline: 31 Planned Target: 45	42 (2023: 39)	The achieved target is from RIMA 3 published in 2024.	RIMA Round 3 Report
Outcome 3A.2 Indicator: % of households with total monthly expenditure above the minimum expenditure basket (MEB) threshold Baseline: TBD Planned Target: TBD	70% (without assistance) (2023: 57%)		REVA 8, 2024
Outcome 3A.3 Indicator: Average reduced coping strategy index Baseline: 3.1 Planned Target: TBC	0.82 (2023: 1.79)		REVA 8, 2024
Outcome 3A.4 Indicator: % of farmers and producers with increased market sales Baseline: N/A	85.65% (2023: 36.3%)	16,613 farmers and producers with increased market sales out of targeted 19,400	Preliminary results of annual SAFE+2 evaluation.

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Planned Target: 60%			
Output 3A.1a: Market and value chain analysis conducted to identify sectors for green economic growth Indicator 3A.1a: # of sectors identified for green economic growth Baseline: TBC Planned Target: TBC	N/A	Target to be based on value chain analysis.	
Output 3A.1.1: Conduct a joint market assessment and value chain analysis on the successes of previous interventions and gaps for future interventions. Indicator 3A.1.1.1: # of market assessments conducted Baseline: 0 Planned Target: 1 in the result chain	0	The target will be achieved within the project duration.	Assessment report
Output 3A.1.2: Conduct value chain analyses. Indicator 3A.1.2.1: # of value chains analyzed Baseline: 0 Planned Target: 2 in the result chain	1		Assessment report
Output 3A.1.3: In cooperation with Food Security Sector, promote visits to different climate smart agriculture programmes to facilitate learnings and exchange of best practices. Indicator 3A.1.3.1: # of exchange visits Baseline: 0 Planned Target: 36 in the result chain	N/A	Activity not funded through SAFE+2	

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Output 3A.1.4: Develop integrated Family Farming System (Agriculture, Livestock and Fishery) guidelines through Farmers Field School (FFS) approach. Indicator 3A.1.4.1: # of unified strategies relevant for the complementary in approaches developed Baseline: TBC Planned Target: TBC	0	A draft guideline is prepared which is under the process of finalization. This will be finalized within the 1st quarter of 2025.	Guideline document
Output 3A.1.5: Streamline Aggregation/Collection Center guidelines, best practices, and market linkage mapping. Indicator 3A.1.5.1: # of unified strategies relevant for the complementary in approaches developed Baseline: 0 Planned Target: 1 in the result chain	(2023: 1)	Target has been achieved in 2023.	Guideline document
Output 3A.1.6: Develop strategies and guidelines to support Local Services Providers (e.g. market aggregators, vaccinators, and farm mechanics) and ICT-based extension service providers. Indicator 3A.1.6.1: # of unified strategies relevant for the complementary in approaches developed Baseline: TBC Planned Target: TBC	(2023: 1)	Target has been achieved in 2023	Guideline document
Output 3A.1.7: Develop an integrated strategy for off-farm business development plans and linkages with the private sector			

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Indicator 3A.1.7.1: # of unified strategies relevant for the complementary in approaches developed Baseline: 0 Planned Target: 1	N/A	Activity not funded through SAFE+2	
Output 3A.1.8: Conduct a context analysis Indicator 3A.1.8.1: # of context analysis conducted Baseline: 0 Planned Target: 1	N/A	Activity not funded through SAFE+2	
Output 3A.2: Vulnerable host community households are producing environmentally sustainable products and services Indicator 3A.2a: # of targeted households producing sustainable products Baseline: 0 Planned Target: 1,500	10,606	WFP used SAFE+2 fund along with other donor for this output	WFP activity reports
Indicator 3A.2b: USD amount disbursed to groups and individuals Baseline: TBC Planned Target: TBC	138,099 USD	WFP used SAFE+2 fund along with other donor for this output	Distribution reports
Output 3A.2.1: Establish self-help and producer groups, strengthen their capacity, and support marginal green business opportunities. Indicator 3A.2.1.1: # of producer groups supported Baseline: 0 Planned Target: 1,500 in the result chain	842		WFP progress report

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Output 3A.2.2: Establish FFS groups to produce high-demand and high-nutrient crops through climate-sensitive agricultural practices Indicator 3A.2.2.1: # of FFS groups created Baseline: 0 Planned Target: 250 farmer groups comprised of 5000 farmers (20 farmers in each group)	140 farmer groups comprised of 2,800 farmers were created. <i>(2023: 110 farmers comprised of 2200 farmers)</i>	In 2024, 140 farmer groups comprising 2,800 farmers were formed. In 2023, 110 groups comprising 2,200 farmers were formed. In total, 250 groups were formed with 5,000 farmers. The target has been achieved.	Farmer database
Indicator 3A.2.2.2: # beneficiaries reach with homestead production system technologies. Baseline: 0 Planned Target: 250 farmer groups comprised of 5000 farmers	140 farmer groups comprised of 2,800 farmers reached <i>(2023: 110 farmer group comprised of 2200 farmers)</i>	In 2024, 140 farmer groups comprising 2,800 farmers were reached with homestead gardening training and inputs. In 2023, 110 groups comprising 2,200 farmers were reached with homestead gardening training and inputs. In total, 250 groups were formed, supporting 5,000 farmers. The target has been achieved.	Distribution master roll and training participant list.
Output 3A.2.3: Conduct trainings on climate resilience entrepreneurship, vocational skills, financial literacy, decision making and business management and development. Indicator 3A.2.4.1: # of women/men trained Baseline: TBC Planned Target: 29,129 in the results chain	19,977 female	WFP provided training with SAFE+2 and other donor funding	Training report
Output 3A.2.4: Establish networking between producer groups and decentralized banking agents and microfinance institutes for smallholder farmers and entrepreneurs' access to green loans/ credits and small producer groups' financial inclusion.		FAO is working to open bank accounts in formal banks for each of the 250 farmer groups	

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Indicator 3A.2.4.1: # of households accessing financial inclusion Baseline: 0 Planned Target: 29,129 in the results chain	0	comprising 5,000 farmers. Thus, FAO will ensure the financial inclusion of 5,000 farmers. The target will be achieved within the project duration.	
Output 3A.2.5: Support the rehabilitation and/or construction of agricultural/fishery infrastructure (e.g. irrigation channel, fishpond) using nature-based solutions through the food assistance for assets modality. Indicator 3A.2.5.1: # of infrastructures rehabilitated Baseline: 0 Planned Target: 14 in the results chain	79	WFP use SAFE+2 and other donor funding	WFP activity tracker
Output 3A.3: Established on- and off-farm producer groups are linked to markets Indicator 3A.3a: % of producer groups linked to the markets Baseline: 0 Planned Target: 70%	76 %	In 2023, the average sale value by each of the project-supported farmers was USD 452 which has increased to USD 673 in 2024.	RIMA round 4
Indicator 3A.3b: Value of sales (USD) Baseline: 0 Planned Target: Average USD 1,000	Average 673 USD	In 2023, the average sale value by each of the project-supported farmers was USD 452 which has increased to USD 673 in 2024.	RIMA round 4
Indicator 3A.3a: Volume of sales (MT) Baseline: 0 Planned Target: Average 4 tons	Average 1.7 tonnes	In 2023, the average production of each of the project-supported farmers were 1.4 MT which has increased to 1.7 MT in 2024.	RIMA round 4
Output 3A.3.1: Conduct market linkage workshops and social awareness programmes with key stakeholders and connect livelihoods beneficiaries from			

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SAFE+ to markets to further grow their businesses. Indicator 3A.3.1.1: # of market linkage workshops Baseline: 0 Planned Target: 8 in the results chain	0	This activity is planned for 2025.	Workshop participant list, Workshop report.
Output 3A.3.2: Establish a network with youth to provide apprentice / vocational training for ICT-based extension services, marketing, farm mechanization, and financial services. Indicator 3A.3.2.1: # of people connected to ICT services Baseline: 0 Planned Target: 2,000	0	This activity is planned for 2025	Service tracking database
Output 3A.3.3: Strengthen the existing network and capacity of farmers' aggregation centres. Indicator 3A.3.3.1: # of established agriproducts aggregation centers Baseline: 0 Planned Target: 10	(2023: 10)	Target has been achieved in 2023.	Aggregation center list with GPS co-ordinates.
Indicator 3A.3.3.2: % of beneficiaries linked to markets through aggregation centers Baseline: 0 Planned Target: 40%	6 %	In 2023, 5% of farmers were connected to the local market through the Aggregation Centers, which increased to 6% in 2024. The activity continues in 2025.	RIMA round 4
Output 3A.3.4: Develop an e-commerce platform in cooperation with Chamber of Commerce for off-farm host community producers and organize product fairs in cooperation with			

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Chamber of Commerce and the private sector. Indicator 3A.3.4.1: # of e-commerce platforms and product fairs organized Baseline: TBC Planned Target: TBC	N/A	Activity not funded through SAFE+2	
Outcome 3B: The resilience of Rohingya refugees, especially vulnerable groups, is sustained			
Outcome 3B.1 Indicator: Resilience capacity score increased (compared to baseline) Baseline: 19 Planned Target: 40	39 <i>(2023: 36)</i>		RIMA round 3
Outcome 3B.2 Indicator: Average reduced coping strategy index Baseline: TBD Planned Target: TBD	1.49 <i>(2023: 3.93)</i>		REVA 8
Outcome 3B.3 Indicator: % of households with acceptable food consumption score Baseline: N/A Planned Target: TBC	65 % <i>(2023: 30%)</i>		REVA 8
Output 3B.1: Approaches assessed and identified for quality, sustainable and complementary programming in the camps Indicator 3B.1: # Approaches assessed and identified for quality, sustainable and complementary programming in the camps Baseline: 0 Planned Target: 3 (1 for UNHCR, 1 for IOM and 1 for WFP) under the GAC funding allocation.	IOM conducted one study in 2022.	IOM conducted a skills development study which included looking at the environmental impact of skills development centres. The study was reported in the 2022 report. UNHCR considered this study no longer needed and has requested to reallocate this funding in support of LPG refills.	Study was attached to 2022 report.

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Output 3B.1.1: Conduct a skills development study including looking at the environmental impact of the skills development centres. Indicator 3B.1.1.1: # of studies conducted Baseline: 0 Planned Target: 3 (1 for UNHCR, 1 for IOM and 1 for WFP) under the GAC funding allocation.	IOM conducted one study in 2022.	IOM conducted a skills development study which included looking at the environmental impact of skills development centers. The study was reported in the 2022 report. UNHCR prioritized another GAC livelihoods study during the reporting period and considers this activity no longer needed. They have requested to reallocate funds for this activity to LPG refills.	Study was attached to 2022 report.
Output 3B.1.2: Strengthen environmentally sound and nutrition sensitive home gardening technology and operational strategies and a GIS map to tailor the most suitable practices. Indicator 3B.1.2.1: # of operational strategies /guidelines for homestead gardening developed Baseline: 0 Planned Target: 2 funded by GAC	Target achieved in 2022. <i>(2022: FAO: 1)</i>	Report delivered by FAO in 2022. Funding for UNHCR has been requested to be moved to LPG refills due to the FAO's homestead guidelines being sufficient.	Homestead gardening guideline document.
Output 3B.1.3: Develop an innovative strategy on fresh food waste management in camp markets based on circular economy approach. Indicator 3B.1.3.1: # of common strategy on fresh food waste management Baseline: 0 Planned Target: 1 funded by GAC	0	A fresh food waste management guideline will be prepared in 2025.	Guidelines document

ANNEX 1

Output 3B.2: Rohingya refugees' green skills developed through training and inputs Indicator 3B.2a: # of targeted households practicing sustainable skills development Baseline: 0 Planned Target: TBC	32,320	WFP used SAFE+2 and other donor funding	Training participation record
Indicator 3B.2b: # of beneficiaries receiving cash/in-kind supports through the programme Baseline: TBC Planned Target: TBC	32,320	WFP used SAFE+2 and other donor funding	Distribution list
Output 3B.2.1: Implement vocational green centre-based skills training and production activities related to humanitarian and sector-based needs. Indicator 3B.2.1.1: # of beneficiaries trained on vocational skills development Baseline: 0 Planned Target: 560 under GAC funding	(2022-2023: 10,148 (6,503 female/64%); 3,645 males/36%)	Target was achieved in 2023	Training participant list.
Output 3B.2.2: Implement vocational green centre-based skills training and production activities related to humanitarian and sector-based needs. Indicator 3B.2.2.1: # of beneficiaries trained on homestead gardening and/or community aquaculture Baseline: 0 Planned Target: 5,000 under GAC funding	(2023: 600 trained on homestead gardening and 500 beneficiaries trained on aquaculture)	Target was achieved in 2023	Training participant list

ANNEX 1

Output 3B.2.3: Build awareness on fresh food waste and conduct trainings on composting and waste management. Indicator 3B.2.3.1: # of beneficiaries with improved understanding of fresh food waste management Baseline: 0 Planned Target: 40 under GAC funding	0	The training module for fresh food waste management will be finalized in 2025 and training of Rohingya households on fresh food waste management will begin shortly after. .	
Indicator 3B.2.3.2: # vermicompost produced Baseline: 0 Planned Target: 200 farmers	0	In the camp context, it is not allowed to produce vermicompost therefore beneficiaries will be trained on composting using the fresh food wastes. A compost producer tracking tool is developed to track how much and how many farmers are producing compost. After completion of the training, beneficiaries will start producing the compost and the tool will be used to track the progress.	

ANNEX 1

FINAL REPORT

MID-TERM EVALUATION OF THE SAFE ACCESS TO FUEL AND ENERGY PLUS PROGRAMME (SAFE+2)

No. RFP/HCR/CXB/2023/004

SUBMITTED TO



SUBMITTED BY

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Human Development Research Centre
humane development through research and action

10 April 2024

Disclaimer

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Abbreviations

AAP	Accountability to Affected Population
ACTED	Agency for Technical Cooperation and Development
BDRCS	Bangladesh Red Crescent Society
CiC	Camp in Charge
CNRS	Centre for Natural Resource Studies
DAE	Department of Agricultural Extension
DCI	Data Collection Instrument
DoE	Department of Environment
DRR	Disaster Risk Reduction
DRR	Disaster Risk Reduction
ERT	Elephant Response Team
FAO	Food and Agriculture Organization
FDMN	Forcibly Displaced Myanmar Nationals
FFS	Farmer's Field School
FGD	Focus Group Discussion
FSS	Food Security Sector
GBV	Gender-based violence
GoB	Government of Bangladesh
HH	Households
IASC	Inter-Agency Standing Committee
IGA	Income Generating Activities
IOM	International Organization for Migration
IUCN	International Union for Conservation of Nature
KII	Key Informant Interview
LPG	liquefied petroleum gas
MPTFO	Multi-Partner Trust Fund Office
PSEA	Prevention of Sexual Exploitation and Abuse
PwD	Persons with Disability
REVA	Refugee Influx Emergency Vulnerability Assessment
RRRC	Refugee Relief and Repatriation Commissioner Office
SAFE+	The Safe Access to Fuel and Energy Plus
ToR	Terms of Reference
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees
USD	United States Dollar
WFP	World Food Programme

Executive Summary

The Safe Access to Fuel and Energy Plus (SAFE+2) programme objectives are to enable Rohingya refugees in the Cox's Bazar District to access cleaner energy, support the region's environment and ecosystems, and provide skills development and livelihoods to refugees and Bangladeshi host communities. The programme is currently in its second phase (July 2022 - March 2025) and builds upon successes and lessons learned that were obtained during the programme's first phase (January 2019 – June 2022). The SAFE+2 programme is jointly implemented by the Food and Agriculture Organization of the United Nations (FAO), the International Organization for Migration (IOM - UN Migration), the United Nations High Commissioner for Refugees (UNHCR), and the United Nations World Food Programme (WFP).

This Mid-Term Evaluation aims to generate evidence on the programme's outcomes and impacts and guide the remainder of the programme's implementation period. The generated information is foreseen to provide actionable advice to the programme's key stakeholders and to guide similar (future) initiatives to achieve sustainable results. The main objective of this evaluation is to evaluate the programme's performance against the desired results articulated in the foundational programme document and Result Framework.

This evaluation adopted a mixed-method approach with a quantitative survey, qualitative information collection, and secondary document analysis. The survey took place in March 2024. The total sample size for the quantitative survey was 712, covering 120 households from the host community and 592 from the Rohingya community. 16 FGDs were conducted separately with the host and Rohingya community of male and female beneficiaries. A total of 22 Key Informant Interviews were conducted with the Camp in Charge (CiC), SAFE+2 Strategic Priority leads, Heads of (Sub) Offices from relevant agencies, other UN Agency staff, staff from partner organisations implementing SAFE+2 activities, officials from the Department of Environment and Department of Forest from Cox's Bazar district and local community leaders are known as Majhi.

Key Evaluation Findings

Programme Performance and Effectiveness

This programme distributed LPG to 100% of the targeted 200,000 refugee households located in 33 refugee camps within 2023. A total of 1,797,092 refills have been provided to these households in 2023. All the Rohingya HHs received 10.42 (12kg) LPG refills around the year. Through this, LPG distribution has saved 13,390 hectares of forest (based on Bangladesh Forest Inventory in 2017). Additionally, the use of LPG has caused a reduction of 375,300 tonnes of carbon dioxide emissions annually¹. In this case, the baseline estimated value is 407,000, and the alternative target in the programme document is 655,000 annually. WFP and IOM with technical support from FAO has planted trees covering 105 hectares of land (32 in 2022 and 73 in 2023) engaging community people through Cash for work. As a result, 11.69% of the environment and ecosystems were rehabilitated during this time (See Figure 6). Through the execution of all activities, this intervention was successful in managing 1,279 tonnes of Carbon sequestration. As per the evaluation findings, 36.3% of farmers and producers successfully increased their production and market sales in 2023 compared to 2022.

¹ based on the methodology adopted by the Stanford University study for the Human Health and Environmental Costs and Benefits of Liquefied Petroleum Gas vs. Firewood for Cooking in the Rohingya Refugee Camp, Bangladesh in 2019. This study set the benchmark for the estimate.

Through this increased production and market sales, the resilience of a portion of farmers and producers has increased.

Impact of the programme

This intervention was planned to reach an estimated 200,000 refugee households as direct beneficiaries. According to the UNHCR data registration after the inception of SAFE+2, 100%² of the target Rohingya households have been covered by the LPG provision. This coverage of the LPG provision has had a positive impact on the Rohingya communities in many ways.

According to the reporting of the surveyed Rohingya households, the impact of LPG provision on their daily lives is reduced cooking time (84%), a neat and clean kitchen (71.1%), low cost (68.7%), no need to collect firewood (59.5%), pain-less cooking with reduced health problems (57.6%), and increased safety (54%). Deforestation has also decreased due to using LPG instead of firewood. 13,390 equivalent hectares of forest have been protected, while 375,300 tonnes³ of carbon dioxide emissions have been abated. As per our findings, about 5.9% of the Rohingya community is engaged in the maintenance of tree plantations at a minimum cost of wages. Now, they are becoming aware of the direct and indirect benefits of forest conservation/protection. In response to the impact of forest conservation on their day-to-day life, they mentioned many options of benefits like providing shades (88.3%), cooler temperature (68.8%), landslide risk mitigation (34.1%), minimising cyclone damage (34.4%), providing fruits (33.6%) and herbal medicine (23.8%). The conflict between the host and the Rohingya community over natural resource extraction, use of water bodies, etc., has decreased in the meantime. It is also mentionable that the Department of Forest has helped this programme develop a land stabilization method, promoting the plantation of various fast-growing indigenous species and replant in the area, which was previously national forest land. The local leaders and Camp in Charge took the initiative to resolve the conflicts. They engaged the relevant GoB authorities when and where needed. Further, the capacity of these communities to resolve this conflict has also increased. As per our findings, an average 2.6 number of conflicts between the community and plantation protectors generally occurred in 2023 every year, and 1.2 times initiatives per conflict were carried out to resolve those conflicts. However, most (43.5%) of the conflicts were managed by the joint coordination of the host and Rohingya community.

The training provided to males and females has a noteworthy impact on increasing agricultural production. The increase in average agricultural production in 2023 (789 kg) is higher than in 2022 (749 kg), which is evidence of the impact of training on the host community. As per their reporting, the average price of this production was 37,193 Tk. in 2023 and 21,329 Tk. In 2022.

Efficiency

According to the Annual Programme Narrative Progress Report, the total approved budget is USD 282,039,934. In 2022, Canada and Sweden were the main donors of this programme, with Norway joining in 2023. All UN agencies (FAO, IOM, UNHCR, and WFP) received \$11,438,564 from July to December 2022. Additionally, Canada, Norway and Sweden transferred \$15,739,441 in 2023, and based on the provided fund, FAO, IOM, UNHCR, and WFP executed a few of the designed activities.

Under strategic priority 1, LPG has been provided to 100% of Rohingya households, while pressure cookers have been distributed to 85,000 households. The total annual prioritized budget for 2023 was \$33.2 million. The achievement within this budget is highly satisfactory and cost-effective. Under

² As per discussion with UNHCR, the LPG refills have been provided to all the Rohingya households targeted under the strategic priority 1.

³ Targeted HHs (194,937 HH) received 10.42 (12kg) LPG refills around the year. The average HH size is 5.31. The estimate followed the estimation methodology adopted at baseline. The number of households at the baseline was 211,382.

Strategic Priority 2, there was a \$0.9 million budget deficit against the required annual prioritized budget of \$2.8 million in 2023, while \$1.9 million were available. However, the achievements within the available budget were effective, mentionable, and visible. Under Strategic Priority 3, the annual prioritized budget was \$ 1.2 million in 2023. However, the budget spending for these activities had a noteworthy impact on the achievement of increased market sales, training received by host communities, and yearly increased production.

Relevance

The project's goals, outcomes, and outputs were connected to the government's policies and strategies for improving the condition of both the Rohingya and the host communities. This is highly aligned with the Government's Joint Response Plan for the Rohingya Humanitarian Crisis, SDG 1: End poverty in all its forms everywhere; SDG 2: Zero Hunger; SDG 5: Gender Equality; SDG 7: Ensure access to affordable, reliable, sustainable, and modern energy for all; SDG11: Sustainable cities and human settlements aim to make cities and human settlements inclusive, safe, resilient, and sustainable; SDG 13: Climate Action and Synergies.

Accountability to Affected Population

As per the evaluation, all the implementing partners have successfully followed the Accountability to Affected Population (AAP) framework by designing the programme's proposal and activities to execute these activities at the field level. As per the discussion before, this programme has successfully responded to the affected population, including displaced Rohingya refugees and the surrounding host community affected by the Rohingya influx, including women, girls, children, Persons with disabilities, and elderly people. This evaluation found that the accountability of the UN implementing agencies toward the affected population was active, effective, visible, functional, and responsive.

Lesson Learned

- LPG distribution is the most optimum solution for cooking fuel in Cox's Bazar. All the Rohingya households use LPG as the best cooking option instead of firewood.
- LPG use and pressure cookers have helped decrease cooking time, increasing the cooking days without using firewood. As a result, the use of firewood has reduced.
- The roadside, Riparian and slope tree plantation has been an effective initiative for restoring the environment. Rohingya's engagement in maintaining and caring for the forest land provide economic opportunity through Cash for Work.
- This programme's initiatives to resolve conflicts over natural resources are effective, as most of the surveyed Rohingya and host communities reported that conflicts have decreased recently.
- Training, awareness, support, and market linkage mechanisms can help increase agricultural production.
- This programme has established Aggregation Centres as a facility for aggregation, storage, processing, distribution, and/or marketing of locally or regionally produced food products".
- This intervention has provided LPG to a mentionable portion of female-headed households, elderly people, and persons with disabilities.
- Women's inclusion in training might increase agricultural production.

Recommendations

Strategic Priority 1:

- All households should be provided with pressure cookers to minimize the cost of cooking and the use of firewood.
- Rohingya households should receive refresher training on the use and benefits of LPG and pressure cookers.

Strategic Priority 2:

- Community awareness interventions should be provided to the host and Rohingya communities, focusing on the reasons for environmental damage, its devastating impact and steps that need to be taken to restore the environment at the individual and community levels.
- Community awareness interventions should be provided to the host and Rohingya communities, focusing on the conflict of natural resources and how to solve the problems mutually. This programme may develop a mechanism-chain for resolving these conflicts.

Strategic Priority 3:

- This programme should ensure more women's engagement in food production with a robust monitoring system.
- This intervention should take more initiatives to strengthen the Aggregation Centre by increasing the producer capacity through training and motivation activities.
- The programme should strengthen the e-commerce platform by popularising the Farm2Go App.
- The programme should reprioritize the activities according to the budget available to the implementing agencies. As per the requirements, selected SAFE+2 activities may be reduced.

Overall:

- The MPTF and bilateral funding model is efficient but has some disadvantages to implementing the activities according to the workplan due to funding constraints. To avoid this problem, the program should reprioritize the activities as per the timeline and availability of funds and clarify which target will be achieved at the end of the program.

Chapter 1: Evaluation Approach and Methodology

1.1 The SAFE+2 programme and evaluation context

The Safe Access to Fuel and Energy Plus (SAFE+2) programme objectives are to enable Rohingya refugees in the Cox's Bazar District to access cleaner energy, support the region's environment and ecosystems, and provide skills development and livelihoods to refugees and Bangladeshi host communities.

The programme is currently in its second phase (July 2022 - March 2025) and builds upon the successes and lessons learned during its first phase (January 2019—June 2022). This initial phase of the programme implemented by FAO, IOM, and WFP included its own mid-term evaluation and end evaluation, of which the results, recommendations, and lessons learned can be shared.

After the launch of SAFE+2, the activities have been executed for the last eighteen months (1.5 years). As a result, it aims to evaluate the programme to explore the achievements and impact towards the set target of the programme goals based on the outcome and output indicators and the programme beneficiaries. The evaluation has also attempted to investigate the attainments of strategic priorities set for this programme. Additionally, the findings captured from this mid-term evaluation depict the programme's performance, effectiveness, relevance, impact, resource allocation and utilization, and durability. Finally, it is also expected that the lessons learned, and recommendations drawn from this evaluation will show the way to further programme implementation toward achieving the ultimate goal at the end of the programme.

1.2 Purpose and Objectives of the Evaluation

Purpose: To generate evidence on the programme's outcomes and impacts and guide the remainder of the programme's implementation period. The generated information is foreseen to provide actionable advice to the programme's key stakeholders and to guide similar (future) initiatives to achieve sustainable results. The Mid Term Evaluation also contributes to organizational knowledge management by capturing lessons learned and supports advocacy activities and donor reporting requirements.

Main objective: To evaluate the programme's performance against the desired results articulated in the foundational programme document and Result Framework.

Specific objectives:

- **Fit-for-purpose & organizational synergies:** Assess whether the project has adequately responded to the short, medium, and long-term challenges expressed in the project documents, including through expected synergies of a multi-sectoral approach.
- **Planning & performance:** Assess the project's overall performance from planning and implementation by identifying the programme's key strengths and gaps and recommending future improvements.
- **Capturing lessons learned:** Produce and document vital lessons learned and innovations/best practices that may contribute to future strategies, interventions, and knowledge management.

- **Durable approaches:** Consider durable approaches to the programme in the context of Cox's Bazar's humanitarian funding situation and potential exit strategies in the operation's funding climate.
- **Beneficiary participation:** Better understand what the programme has achieved regarding the participation of its beneficiaries in terms of planning and programming.
- **Gender and disability:** Inform how the programme has supported gender and disability mainstreaming.
- **Outcome-level indicators:** Provide inputs and analysis on impact and outcome-level indicators captured in the programme's Results Framework.
- **Rightsizing:** Assess and recommend how the programme can be better tailored and rightsized to the context of its allocated resources to optimise achieving its stated objectives. In this context, assess and advise which (reporting) indicators can be removed and which activities can be deprioritised from the programme's Results Framework in the programme's current set-up and, in conjunction with the programme's partners.

1.3 The Applied Methodology

An appropriate research design was adopted to facilitate the smooth sailing of research operations. This made the proposed evaluation as efficient as possible, yielding maximum information with minimum effort (time, cost, etc.).

1.3.1 Evaluation Design

This evaluation employed a comprehensive mixed-method approach, combining quantitative and qualitative methodologies to gather insights and data from diverse primary and secondary sources. The documentation review thoroughly examined various SAFE+2 project documents, including proposals, narratives, financial reports, activity reprioritisation plans, monitoring data, budget allocations, and annexes. Additionally, it encompassed reviewing documents, results, and lessons learned from past initiatives related to cleaner cooking and safe access to Fuel and Energy for comparative analysis. The quantitative component focused on acquiring data related to impact and outcome areas. At the same time, the qualitative aspect delved into nuanced aspects such as access to cleaner cooking energy, improved natural resource management, green skills development, livelihoods, climate resilience, food security, and reduced exposure to gender-based violence (GBV) and disaster risks. Qualitative techniques included conducting Focus Group Discussions (FGD) with programme beneficiaries and Key Informant Interviews (KII) with various stakeholders, encompassing UN agencies' staff, SAFE+2 coordinators, strategic priority leads, agency heads, partner organizations' staff, government officials, community leaders [Camp in charge (CiC) and Majhi], and the Rohingya refugees and host communities in the Cox's Bazar District.

The comparable baseline statistics of the target outcome indicators were available from the end-line evaluation report of the earlier phase of SAFE, the results framework developed for SAFE+2, and the indicator-based performance assessment of the annual programme narrative progress report (July 2022 to December 2022).

1.3.2 Evaluation Framework

The midterm evaluation was generated by addressing all the specific objectives mentioned in the ToR. The approach to addressing all the specific objectives is given below.

Table 1: Evaluation Framework

Specific Objectives	Evaluation Questions	Evaluation strategy
Fit-for-purpose & organizational synergies	Assess whether the project has adequately responded to the short-, medium-, and long-term challenges expressed in the project documents, including through expected synergies of a multi-sectoral approach.	- Programme/monitoring progress report review - KII findings
Planning & performance	Assess the project's overall performance from planning and implementation by identifying the programme's key strengths and gaps and recommending future improvements.	- Qualitative findings - Quantitative findings - Programme based Secondary documents review. - Outcome and output indicators assessment
Capturing lessons learned	Produce and document vital lessons learned and innovations/best practices that may contribute to future strategies, interventions, and knowledge management.	- Qualitative findings - Review of programme documents related to lessons learned and best practices. - Activity progress report
Durable approaches	Recommend durable approaches to the programme in the context of Cox's Bazar's humanitarian funding situation. Recommend potential exit strategies in the context of the operation's funding climate.	- Qualitative findings - Quantitative findings - Programme based Secondary documents review. - Outcome and output indicators assessment
Beneficiary participation	Understand better what the programme has achieved regarding its beneficiaries' participation in planning and programming.	- Qualitative findings - Quantitative findings - Outcome and output indicators assessment
Gender and disability	Inform how the programme has supported gender and disability mainstreaming.	- Qualitative findings - Quantitative findings - Programme based Secondary documents review
Outcome-level indicators	Provide inputs and analysis on impact and outcome-level indicators captured in the programme's Results Framework	- Quantitative findings - Outcome and output indicators assessment - Monitoring data
Rightsizing	Assess and recommend how the programme can be better tailored and right sized to the context of its allocated resources to optimise achieving its stated objectives. In this context, assess and advise which (reporting) indicators can be removed and which activities can be deprioritised from the programme's Results Framework in the programme's current set-up and, in conjunction with the programme's partners.	- Qualitative findings - Activity progress report - Review of objective, outcome, and output indicators - Programme documents related to budget source and availability

1.3.3 Selection of Programme Outcome Indicators and Programme Aspects

This evaluation adopted the programme indicators presented in the published ToR under the three strategic priorities. In addition, this evaluation also attempted to assess the programmatic aspects as mentioned in the ToR. Table 2 deals with the sources and data collection methods based on the outcome indicators and programme aspect review.

Table 2: Midterm Evaluation indicator mapping

Indicator	Sources of Data/Information	Data Collection methods
Outcome 1: Targeted households have safe and sufficient access to cleaner cooking energy to meet their basic needs.		
# Equivalent hectares forest protected.	- SAFE+2 Strategic Priority leads - Staff from Partner organisations that implement SAFE+2 activities. - Official of Cox's Bazar District Environment and Forest Development - Satellite imagery	- Documents Review -KII -Satellite imagery for the land use land cover (LULC) changes using remote sensing
# Tones carbon dioxide emissions abated.	- Beneficiary survey - SAFE+2 Strategic Priority leads - Staff from Partner organisations that implement SAFE+2 activities. - Official of Cox's Bazar District Environment and Forest Development	- Documents Review - Household survey (adopting the methodology developed by Stanford University for SAFE) -KII
Outcome 2: Environment and ecosystems rehabilitated to strengthen community resilience to mitigate conflict over natural resources, disasters, and climate shocks.		
% Of land/ ecosystems rehabilitated in Cox's Bazar through Programme interventions	- SAFE+2 Strategic Priority leads - Staff from Partner organisations that implement SAFE+2 activities. - Official of Cox's Bazar District Environment and Forest Development	-Secondary Documents Review -KII -Satellite image (FAO will share the specifications)
Tones carbon dioxide sequestered through Programme interventions	- SAFE+2 Strategic Priority leads - Staff from Partner organisations that implement SAFE+2 activities. - Official of Cox's Bazar District Environment and Forest Development	-Documents Review -KII
% Of conflicts over natural resources successfully managed.	- SAFE+2 Strategic Priority leads - Staff from Partner organisations that implement SAFE+2 activities. - Host and Rohingya beneficiaries - CIC - Majhi	-Documents Review -HH Survey -KII -FGD
Outcome 3A: The resilience of vulnerable host communities, especially women, is sustained		
% Of farmers and producers with increased market sales.	- SAFE+2 Strategic Priority leads - Staff from Partner organisations that implement SAFE+2 activities. - Host and Rohingya beneficiaries - Other UN Agency staff - Government agency officials	-Documents Review -HH Survey -KII -FGD -Observations (aggregation centres)
Gender		

Indicator	Sources of Data/Information	Data Collection methods
% Approximate number of women and girls (individuals) report reduced hours spent on unpaid care work due to SAFE+2 activities.	- Host beneficiaries (Women) - Rohingya women and girls	-HH Survey -FGD
% Of Rohingya households enrolled in SAFE+2 programme activities where women, men, or both women and men make decisions on using transferred resources.	Rohingya beneficiaries	-HH Survey -FGD
Women's autonomy index for (a) skills development activities in the refugee community and b) livelihood activities in the host community.	Host and Rohingya beneficiaries (Women)	-HH Survey (The livelihood activity index analysis methodology is available from WFP. Skills development activities index not prepared)
Programmatic aspects that are to be reviewed		
Aspect-1: The degree of synergy obtained between the SAFE+2 partners, assessing where partners build upon and complement each other's mandate and strengths	- SAFE+2 Strategic Priority leads - Project Staffs - Staff from Partner organisations that implement SAFE+2 activities	-KII -Discussion meeting
Aspect-2: The degree to which innovative approaches have been explored and tried	- SAFE+2 Strategic Priority leads - Project Staffs - Staff from Partner organisations that implement SAFE+2 activities. - Host and Rohingya beneficiaries	-KII -FGD
Aspect 3: The degree to which lessons learned from other programmes, including other cleaner cooking programmes in humanitarian settings, can and still be considered.	- SAFE+2 Strategic Priority leads - Staff from Partner organisations that implement SAFE+2 activities. - Host and Rohingya beneficiaries - Other UN Agency staff - Relevant other NGO's	-KII

1.3.4 Data Collection Approach

This evaluation adopted the following different data collection methods and approaches as given below:

- Quantitative Survey
 - Household Survey with Rohingya and host community
- Qualitative Information Collection
 - Focus Group Discussion (FGD)
 - Key Informant Interview (KII)
- Structured observation
- Secondary Documents Review

1.3.5 Sample Distribution and Sample Selection Strategy

The evaluation targets specific groups and themes aligned with strategic priorities outlined in the ToR. For gender-related indicators, focusing on women in Rohingya and host communities was emphasised by multiple strategic priorities (described in Table 3). Environmental assessments, covering land use and cover dynamics, involved remote sensing, document analysis, and KII for both Rohingya and host communities. The evaluation also addresses abated carbon dioxide emissions, employing analysis and

insights from previous documentation reviews. This targeted and thematic approach ensured a comprehensive understanding of the programme's impact across different dimensions.

Quantitative Survey Method

The sample size of workers was determined using the well-known statistical formula for binomial probability. It assumed a two-tailed hypothesis considering a 95% confidence interval and a 5% level of precision. The sample size was also adjusted by a design effect 1.5 to account for the multi-stage sampling.

$n = \frac{Z^2 PQ}{e^2} \times deff$	Where n = Estimated Sample Size, P=0.5 (proportion of target indicator), Q = 1-P, Z= 1.96 (Standard normal variate value at 95% confidence level), e =0.05 (Precision level), deff = Design effect=1.5.
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The total number of samples was distributed purposively among the Rohingya and Host communities. The total number of samples was distributed purposively among the Rohingya and Host communities. To address outcome 3A: % of farmers and producers with increased market sales farmers and producers was added as respondents. The table has outlined the distribution of samples among different types of respondents. The household-level beneficiaries include 592 samples organised into 30 clusters. Additionally, a targeted group of 120 farmers and producers from the host community comprised 10 samples in a single cluster. The evaluation involved 712 samples spread across 40 clusters, ensuring a representative and comprehensive assessment of the programme's impact on Rohingya and host communities. The sampled population was selected using a multi-stage cluster sampling design.

Table 3: HH Sample Distribution as per the target Communities, Respondents, and Clusters

Respondents	Target Community	Number of Samples	Number of Clusters
Household level beneficiaries	Rohingya community	592	30
Farmers and producers	Host community	120	10
Total		712	40

Qualitative Information Collection

Focus Group Discussion (FGD): FGDs with the mentioned group provided enough information about their status and the underlying reasons for that, as well as their needs, constraints, and opinions on programme intervention. The primary data collection method employed was Focus Group Discussions (FGD), categorised by the gender of the beneficiaries of the programme and local community members. The respondents, consisting of male and female beneficiaries, participated in four FGDs in host communities and camps. 16 FGDs were conducted separately with the host and Rohingya community of male and female beneficiaries.

Key Informant Interview (KII):

Key Informant Interviews (KII) included a diverse range of individuals, such as Camp in Charge (CiC), SAFE+2 Strategic Priority leads, Heads of (Sub) Offices from relevant agencies, other UN Agency staff, staff from partner organisations implementing SAFE+2 activities, officials from Department of Forest and Department of Environment in Cox's Bazar district and local community leaders known as Majhi. Each category of respondents was allocated a specific number of interviews, resulting in 22 Key Informant Interviews. This structured approach ensured comprehensive insights from key stakeholders, contributing to a holistic understanding of the strategic priorities and activities within the SAFE+2 programme.

On-site observation: HDRC staff visited the SAFE+2 activities in the Cox's Bazar District refugee camps and host community. HDRC team visited the sites in conjunction with the SAFE+2 Partner, as mentioned below.

- Aggregation centre
- Fresh Food Corner
- LPG and Pressure Cooker distribution centre

Document Review:

Project document review helped gather information related to research topics and list possible sources of existing information based on the availability of sources. Following is an indicative list of documents reviewed for the inception report.

- Assessment Report on the Impact of LPG distribution among the Rohingya and Host communities of Cox's Bazar South Forest division on forest resources developed by IUCN and UNHCR
- Assessment of fuel wood supply and demand in displacement settings and surrounding areas in Cox's Bazar District developed by FAO and IOM
- End Line Evaluation Report of SAFE Plus
- Refugee Influx Emergency Vulnerability Assessment (REVA-6) Report developed by WFP.
- Review Of Clean Cooking Options for Refugee Settings Cox's Bazar Bangladesh developed by UNHCR.
- ANNUAL PROGRAMME NARRATIVE PROGRESS REPORT OF SAFE+2_ REPORTING PERIOD: 6 JULY 2022 – 31 DECEMBER 2022
- Indicator Based Performance Assessment of SAFE+2: July 2022 – 31 December 2022
- Assessment report on Pressure Cooker Use and LPG Refill Cycle Adjustment developed by IUCN and UNHCR
- Human Health and Environmental Costs and Benefits of Liquefied Petroleum Gas vs. Firewood for Cooking in the Rohingya Refugee Camp, Bangladesh
- Event Report on Linkage Workshop with Relevant Stakeholders: Market Linkage Livelihood Unit, Cox's Bazar
- Women Autonomy Index (Gender equality and women's empowerment)
- Proposal of Safe Access to Fuel and Energy Plus (SAFE Plus 2)
- Result Framework of SAFE Plus 2
- Elrha-R2HC_Research-Snapshot on impacts of providing cooking fuel in refugee camps.
- Reprioritized Activity Plan of (SAFE Plus 2)

1.3.6 Quality Assurance Mechanism

The data collection involved 12 field personnel divided between two teams. The field personnel were trained for three days, and one day was dedicated to field practice. The field practice ensured that the tab-based application was running without error. The teams uploaded data daily, and a reviewer checked the data consistency. The fieldwork was completed in two weeks.

Qualified supervision and monitoring team performed quality control during data collection teams during Fieldwork. The supervisors maintained close contact with the teams under their responsibility and with the core team. In addition, field control tables (data quality tables) were run to detect systematic errors during field data collection. In case of such systematic data errors, the core team followed up with field personnel and the responsible team through discussion.

Accuracy Assessment for LULC: The evaluation adopted ArcGIS 10.8 to assess the accuracy of classified images. Randomly generated reference points were compared to user-assigned classes.

1.3.7 Challenges of the Evaluation and Mitigation Measures

- One of the challenges was understanding the Rohingya community's colloquial local language, which is similar to the dialect of Teknaf and Ukhiya Upazilas of Cox's Bazar District. It was also difficult for us to communicate with the Rohingya and host community using their local language as it is unknown to us. For this reason, we deployed the local educated and skilled data enumerators and provided intensive training to collect the most accurate data and information.
- There is always a growing concern over the Bangladesh-Myanmar border as the Myanmar internal conflict intensifies, causing major displacement of people fleeing towards the border⁴. The evaluation also faced a difficult situation during field data collection because of the concern created by Myanmar's internal conflict. As a result, it obtained permission to collect data from the RRRC after the decrease in the Bangladesh-Myanmar border concern. Therefore, it took more than one month to finish this evaluation.
- It was challenging to monitor and review the reforestation activities without the help of Bangladesh Forest Department (BFD) officials and programme personnel. There were always restrictions on visiting all places because of conflict over natural resources between the Rohingya and the host community. Finally, we managed to visit the reforestation places with the respective permission.
- This programme has not set any baseline and target value against its many outcome and output indicators. So, measuring the degree of achievement based on the outcome indicators is challenging.

⁴ <https://www.rescue.org/press-release/growing-concern-bangladesh-myanmar-conflict-intensifies-causing-major-uptick-people>

Section 2: The Programme Design and Strategic Priorities

2.1 Strategic Priorities and Outcomes

The stated goal of the SAFE+ 2 programme is- “Refugee and host communities will become more climate-resilient, and food secure as well as less exposed to gender-based violence (GBV) and disaster risks through sustained access to cleaner cooking energy, improved natural resource management, and green skills development and livelihoods.” As a second phase of the programme, the programme maintains the same goal but is refocused on three main strategic priorities.

The programme’s first strategic objective is to positively impact the nutrition, health, and protection status of 200,000 Rohingya refugees in the Cox’s Bazar District by providing them with access to cleaner energy for cooking purposes. Under this strategic objective, the programme distributed cylinders of liquified petroleum gas (LPG). LPG provisions have positively impacted environmental restoration efforts by removing the need for refugees to collect firewood. While research earlier found LPG to be the safest, cleanest burning, scalable, and most cost-efficient cooking fuel source for the refugees in the Cox’s Bazar area, alternative cooking fuel options continue to be assessed in the year 2023/24.

The SAFE+2 programme’s main expected Outcome under Strategic Priority One, ‘Access to Cleaner Energy,’ is that targeted households have safe and sufficient access to cleaner cooking energy to meet their basic needs. This is done through three Outputs: Output 1: Refugee households have continual safe access to cleaner cooking fuel (LPG); Output 2: Targeted households have access to energy-efficient, reliable, and modern cooking equipment; Output 3: Energy needs and alternatives are assessed.

The second programme objective is to directly contribute to the environment and ecosystems in the Cox’s Bazar refugee camps and the Cox’s Bazar District host community through restoration, disaster risk reduction, and conflict mitigation efforts. Partners’ work in this area focuses on greening the refugee camps and surroundings through planting, preventing erosion and landslides through slope stabilisation, and watershed activities. This objective also focuses on natural resources management, refugee/ host community relations, and environmental research.

The expected outcome under Strategic Priority Two, ‘Environment and Ecosystems,’ is that the environment and ecosystems are rehabilitated to strengthen community resilience and mitigate conflict over natural resources, disasters, and climate shocks. This is done through the following three outputs: Output: 2.1 Environment and socio-ecological knowledge are managed; Output: 2.2 Watersheds are managed, and ecosystems rehabilitated; Output: 2.3 Community Capacity to manage conflicts over natural resources is strengthened.

The third programme objective focuses on enhancing the resilience of the Rohingya refugee population and the Bangladeshi host community by implementing environmentally friendly skills development, livelihoods, and self-sustainability activities. Beneficiaries receive the possibility of obtaining cash for work. Rohingya refugees are provided with greener skills through training and cash for work activities.

The expected Outcome under Strategic Priority Three is to increase the resilience of vulnerable host communities and Rohingya refugees. Outcomes here have been segregated into vulnerable host communities and Rohingya refugees, respectively. Outcome 3A ensures that the resilience of vulnerable host communities, especially women, is sustained. This is targeted through the following

Outputs: Output 3A.1 Market and value chain analysis is conducted to identify sectors for green economic growth; Output: 3A.2 Vulnerable host community households produce environmentally sustainable products and services; Output: 3A.3 Established on- and off-farm producer groups are linked to markets.

2.2 Expected Impact of the Programme

2.2.1 Strategic Priority 1: Access to Cleaner Energy

Short term impact

The continuation of the LPG assistance to Rohingya households will enable food preparation, avoid risk exposure to GBV during firewood collection, and prevent the exploitation of 533,630 tonnes per year of firewood from the mixed hilly forest, which is approximately equivalent to 10,700 hectares and 655,000 tonnes of carbon dioxide emissions abated.

Long term impact

Access to safe energy will reduce the risk of trauma associated with GBV and support good health, food security, and nutrition, especially for growing children. The prevention of firewood consumption across and around camps and the combined effort of reforestation under Strategic Priority Two of this Programme will restore the depleted natural resources of denuded hills and slopes, reducing the risk of landslides and soil loss, recharge underground water reserves, and re-establish critical habitat for biodiversity.

2.2.2 Strategic Priority 2: Energy and Environment

Short-term impact

Land stabilisation and reforestation activities will contribute to the immediate protection of Rohingya refugees and host communities by reducing the risks of flash flooding and landslides and contributing to climate resilience and related adaptation measures. Ecosystem rehabilitation will support the conservation of biodiversity and habitat of the endangered Asian Wild Elephant. Community-based Human Elephant Contact (HEC) mitigation measures will continue to protect the refugees and Elephants from harm by managing human-wildlife contact in an informed and coordinated way. Knowledge management, including assessments conducted, will inform watershed, sustainable land use, and natural resource management planning, monitoring, and evaluation to guide implementation while supporting coordination between partners and stakeholders.

Long-term impact

Interventions under Strategic Priority Two will contribute to the responsible management of natural resources in the area aligned with the climate action plan of the GoB through improved agricultural practices and diversified income opportunities for local farmers and forest-dependent communities. They will contribute to institutional strengthening of government and civil society involvement in sustainable natural resource management and governance. They will also contribute to biodiversity conservation and ensure better ecosystem functionality while strengthening social cohesion and peaceful co-existence.

2.2.3 Strategic Priority 3: Resilience

Short-term impact

Interventions will increase environmentally and economically sustainable livelihood opportunities and strengthen market linkages to improve earning opportunities for vulnerable communities. It will also increase communication opportunities and trust between refugees and host communities.

Long-term impact

Interventions will contribute to creating more resilient households and increasing the peaceful coexistence between the Rohingya and host communities. Localising the humanitarian response creates market opportunities for local producers, with more extensive and diverse markets offering better chances for increasing producers' marginal profit.

2.3 Gender

SAFE+2 partners are committed to ensuring gender mainstreaming and empowerment through gender-sensitive approaches at each level of the intervention, with the integration of women receiving specific attention. All participants in the SAFE+2-supported self-help group/income generation activities are female. As for self-reliance activities, over 60% of participants are female, while in DRR/reforestation activities, 30% of participants are female. Stanford University/ ICDRR research confirmed that SAFE+ LPG distributions reduce GBV and support gender participation and empowerment by increasing the time for girls and boys to participate in education.

All site development and management activities are gender—and diversity-sensitive, with the most vulnerable households considered a priority for assistance and support. During LPG distributions, SAFE+2 partners ensure that community engagement considers age, gender, and diversity mainstreaming and that there are dedicated queues and other services for women at the distribution points.⁵

⁵ Proposal: Safe Access to Fuel and Energy Plus (SAFE Plus 2)

Section 3: Key Findings of The Evaluation

3.1 Household Background Information

Host Community

The total sample was 120 for the host community, comprising 14.2% males and 85.8% females. Nearly one-third (30%) of our surveyed host community respondents were more than 45 years old, while one-fifth (21.7%) were between 35 to 39 years and 40 to 44 years (See Annex Table 23). As many as 90.8% of the respondents are married, a few (5%) are widows, and 3.3% are divorced or separated (See Table 24). Less than two-thirds (60.8%) of the surveyed households had 4 to 6 household members, and one-fifth (21.7%) had 7 to 9 family members. The average household size was counted for 5.7 family members (See Annex Table 26). Nearly half of the (47.5%) surveyed host households had under-5 children, and about three-fifths (61.1%) of the u-5 children were school-going children (See Annex Table 27). As per their reporting, 72.5% of households had adolescents, while 93.1% of these adolescents were used to going to school. Only 9.2% of these adolescents are engaged in income-generating activities (See Annex Table 27). It is also observable that only 15% of households had elderly people. This evaluation also accounted for 2.0% of households having persons with disabilities. The most mentionable disabilities were Physically Impaired (52.9%), sight Impaired (17.6%), cognitive Impaired (11.8%), and Speech Impaired (11.8%) (See Annex Table 28). Lastly, the average earning member of the host community is 1.3 people, while the average household income was 12,415 Tk (See Annex Table 29).

Rohingya Refugee Community

The total sample was 592 for the Rohingya community, comprising 29.2% males and 70.8% females. Our surveyed Rohingya community has been staying in Bangladesh for 6.1 years on average (Annex Table 25). Nearly one-third (29.2%) of our surveyed Rohingya community respondents were more than 45 years old, while one-fifth (21.6%) were between 24 and 29 years old, with 17.2% for 30 to 34 years. A mentionable number of Rohingya (14%) were between 35 and 39 years old (See Annex Table 23). As many as 84% of the respondents are married, a few (9.5%) are widows, and 3.4% are divorced or separated (See Annex Table 24). More than two-fourths (55.4%) of the surveyed households had 4 to 6 household members, while one-fifth (20.8%) had 7 to 9 family members, and 20.1% had 1 to 3 members. The average household size was 5.2 family members (See Annex Table 26). More than two-fourths (56.6%) of the surveyed Rohingya households had under 5 children, and about half (51%) of the u-5 children were school-going children (See Annex Table 27). As per their reporting, 55.9% of households had adolescents, while 76.4% of these adolescents were used to going to school. Only 12.1% of these adolescents are engaged in income-generating activities (See Annex Table 27). It is also observable that only 11.7% of households had elderly people. This evaluation has also accounted that 13% of households have persons with disabilities, while most mentionable disabilities were Physically Impaired (35.1%), cognitively Impaired (29.9%), Speech Impaired (13%), and sight impaired (13%) (See Annex Table 28).

3.2 Programme Performance and Effectiveness

The SAFE+2 implementing partners, especially FAO, IOM, UNHCR, and WFP, have executed, to some extent, a list of planned activities per the developed outcomes set under the strategic priorities based on the available budget. It is mentionable that some activities have not been fully executed because of fund shortages in 2023, while it is expected that these will be done in 2024-25 based on the availability of funds. However, it is noticeable that the achievements captured through this mid-term evaluation are visible against all the baseline values and targets.

Under strategic priority 1, this programme, under the direction of IOM and UNHCR, provided LPG and partially pressure cookers to the Rohingya communities as per planned activities. However, 100% of targeted Rohingya households have been provided LPG, and 85,000 have been provided pressure cookers. Pressure Cookers have so far only been distributed in the UNHCR managed camps while a further distribution in IOM managed camps is under discussion.

Under strategic priority 2, FAO in partnership with IOM and WFP, carried out a list of activities like revegetation, slope revegetation, roadside plantation, and cash-for-work for tree and forest maintenance.

Under strategic priority 3, WFP and FAO integrated the Family Farming System (Agriculture, Livestock, and Fishery), the development of Aggregation/Collection Center guidelines, and the capacity development of farmers' aggregation centres.

Achievements against its target Outcome Indicators

The programme's stated goal is that "Refugee and host communities will become more climate-resilient, and food secure as well as less exposed to gender-based violence (GBV) and disaster risks through sustained access to cleaner cooking energy, improved natural resource management, and green skills development and livelihoods." This evaluation was designed to consider this goal and the outcome indicators mentioned in the terms of reference.

This evaluation has assessed the effectiveness of this programme based on the outcome indicators to draw an evidence-based achievement against all the outcome indicators set under the three strategic priorities. This finding has helped us understand the degree of success in achieving its target and how the programme should be designed to fulfil its full target within the rest of the period.

Strategic Priority 1: Cleaner Cooking Energy

Under this strategic priority, access to cleaner energy is focused on providing cleaner and more efficient cooking energy sources by supplying LPG and energy-efficient cooking equipment to reduce deforestation and mitigate climate change. The outcome indicator is: "Targeted households have safe and sufficient access to cleaner cooking energy to meet their basic needs."

The programme's Strategic Priority 1 focused on 'Access to Cleaner Energy', which included the LPG refill cylinder distribution according to the projected time schedule as per the household size. This programme has also done first-time or replacement stoves and training. These activities aim to decrease the use of firewood among Rohingya households. As a result, deforestation will be stopped, and carbon dioxide emissions will be reduced because of less use of firewood. In 2023, this programme distributed LPG to all targeted Rohingya households in 33 refugee camps in 2023. An annual total of 1,797,092 refills have been provided to these households in 2023. 194,937 HHs⁶ received 10.42 (12kg) LPG refills around the year. IOM and UNHCR are playing a vital role in distributing these LPGs to the enlisted Rohingya households. This evaluation has found the effectiveness of the result drawn through the execution of the designed programme activities.

⁶ Number of registered households by December 2023 as per UNHCR

Table 6: Mid-term achievements of 'Access to Cleaner Energy' based on outcome Indicators in comparison with Baseline.

Indicators	Baseline	Mid-term	Target	Comments
Outcome 1: Targeted households have safe and sufficient access to cleaner cooking energy to meet their basic needs				
# Equivalent hectares forest protected	10,700 ⁷	13,390	10,700	1,797,092 refills to 194,937 HHs (annually)
# Tonnes carbon dioxide emissions abated.	407,000 annually (Using Stanford University/ ICDDR baseline data) ⁸	375,300 annually (Using Stanford University/ ICDDR baseline data)	407,000 (Stanford/ICDDR baseline) 655,000 annually (J-MSNA baseline)	194,937 HHs received 10.42 (12kg) LPG refills around the year. Average HH size 5.31.

This evaluation identified that in the absence of LPG every Rohingya household would require an average of 5.3 kg of firewood per day, equivalent to 159 kg per month, meaning that every household would require the same amount of firewood every month. The amount of firewood needed has been saved by using LPG. Through this, LPG distribution has saved 13,390 hectares of forest, higher than the baseline and target value (10,700). Additionally, the use of LPG has caused a reduction of 375,300 tonnes of carbon dioxide emissions annually. In this case, the baseline estimated value was 407,000. It is assumed that the reason for not achieving the 'carbon dioxide emissions abated target' is the Rohingya community's number of households. It should be noted that the baseline of 407,000 tonnes of CO₂ was calculated in 2019, prior to the opening of Bashan Char, with a total number of households of 211,382. The reduction compared to the baseline can therefore be explained by the reduction of the number of households in Cox's Bazar⁹.

⁷ Annex 1: Indicator Based Performance Assessment: SAFE+2 reporting period 06 July 2022- 31 December 2022

⁸ Annex 1: Indicator Based Performance Assessment: SAFE+2 reporting period 06 July 2022- 31 December 2022

⁹ The research team from Stanford has revised their calculation during the development of the mid-term evaluation albeit with the same baseline number of households.

Strategic Priority 2: Environment and Ecosystems

This strategic priority focused on ecosystem rehabilitation, environmental conservation, and climate action, strengthening refugee-host community relations, and mitigating conflicts over natural resources. SAFE+2 partners, executed a list of activities like revegetation of land, slope revegetation, and roadside plantation¹⁰. WFP continues cash-for-work to plant, maintain, and look after the planted and afforested land. WFP and IOM are implementing field projects, while FAO provides planting materials and technical guidance for the reforestation and restoration of ecosystems. This evaluation has counted the effectiveness of these activities at the field level through an assessment of the outcome indicators. It is to be noted that not all the planned activities have been executed due to a shortage of funds. However, the partial activities already carried out have a practical impact. During this programme, WFP, UNHCR and IOM with technical support from FAO supported tree plantation covering 105 hectares of land (32 ha in 2022 and 73 ha in 2023). As a result, 11.69% of ecosystems were rehabilitated during this time¹¹ (See Figure 6 and Table 7). Through the execution of all activities, this intervention was successful in managing 1,279 tonnes of carbon sequestration¹².

Table 7: Mid-term achievements of “Environment and Ecosystems” based on outcome Indicators in comparison with Baseline.

Indicators	Baseline	Mid-term	Target
Outcome 2: Environment and ecosystems rehabilitated to strengthen community resilience to mitigate conflict over natural resources, disasters, and climate shocks.			
% Of land/ecosystems rehabilitated in Cox’s Bazar through Programme interventions	TBD	11.69%	TBD
Tonnes carbon dioxide sequestered through Programme interventions	TBD	1,279	TBD
% Of conflicts over natural resources successfully managed	0 ¹³	30.4%	TBD

Under the indicator: “Community's capacity to manage conflicts over natural resources”, a list of activities like human-elephant conflict mitigation by supporting households with training and logistics for conflict resolution was planned by this programme. However, a shortage of funds has postponed some of these activities from 2023 to 2024. It is discussed that the programme will execute these activities after receiving the available funds. However, this evaluation reveals that communities has resolved one-third of the total conflicts (30.4%) as per the survey data. These conflicts over natural resources are solved mainly by joint coordination between the host and Rohingya community and the government and camp, including the camp in charge (CiC) (See Annex Table 3). All activities related to this outcome must be completed for better effectiveness.

Strategic Priority 3: Resilience

Strategic priority 3 attempted to strengthen resilience and existing livelihood capacities while preventing further environmental harm due to negative coping strategies and unsustainable agriculture practices. Outcome 3A is: “The resilience of vulnerable host communities, especially women, is sustained.”

As per the findings, under outcome 3A, FAO and WFP have managed to perform a few activities like different climate-smart agriculture programmes to facilitate learning and exchange of best practices, development of integrated Family Farming Systems (Agriculture, Livestock, and Fishery) guidelines, development of Aggregation/Collection Center guidelines and strengthening of the existing network

¹⁰ Annex 1: Indicator Based Performance Assessment SAFE+2 reporting period 06 July 2022- 31 December 2022

¹¹ Analysed using GIS data specifics shared by FAO. The methodology is described in annex.

¹²

¹³ Annex 1: Indicator Based Performance Assessment: SAFE+2 reporting period 06 July 2022- 31 December 2022

and capacity of farmers' aggregation centres. But many of the planned activities are incomplete because of a shortage of funds.

Table 8: Mid-term achievements based on outcome Indicators in comparison with Baseline.

Indicators	Baseline	Mid-term	Target
Outcome 3A: The resilience of vulnerable host communities, especially women, is sustained			
% Of farmers and producers with increased market sales.	TBD	36.3%	TBD

In the meantime, this evaluation has found that about 76.7% of the surveyed 120 host community households received training under this programme. As a result of the programme activities, this evaluation has accounted for 36.3% of farmers and producers with increased market sales. It is mentionable that those who have received agricultural training are engaged in production. Per producer, the average production of 2023 is 789 kg, which is higher than the average production (749 kg) of 2022 (See Annex Table 5). It is also noticeable that 61.7% of our survey host community sells their production through the Aggregation Centre (See Annex Table 6), which underlines that a value chain market for the produced goods has been developed. As per the evaluation findings, 36.3% of farmers and producers successfully increased their production and market sales. Through this increased production and market sales, the resilience of a portion of farmers and producers has increased.

"After receiving training from the Aggregation Centre on homestead gardening, I have started producing different types of vegetables. This has provided me with a great opportunity to use these vegetables for the family and earn money by selling them in the market sometimes."

One of the Community women of Ukhia Upazila

Gender Dimension:

SAFE+2 has paid particular attention to the gender and vulnerable groups to strengthen gender mainstreaming and empowerment by adopting a gender-sensitive approach at each level of the intervention. According to the secondary documents, this programme has ensured 22% of female headed HH for LPG distribution. Additionally, this programme has provided LPG to 12.5% of households with at least one person with a disability and 17.1% of households with elderly people¹⁴.

Additionally, based on the survey, this evaluation found that many more females (88.9%) have received agricultural training than the number of males (11.1%) (See Annex Table 7). Additionally, 62.1% of women and girls have reported that they have been able to reduce the hours spent on unpaid care work due to involvement in the SAFE+2 programme.

Table 9: Mid-term achievements based on outcome Indicators in comparison with Baseline and Target

Indicators	Baseline	Mid-term	Target
a: % approximate number of women and girls (individuals) who report reduced hours spent on unpaid care work due to SAFE+2 activities.	TBD	62.1%	TBD
b: The percentage of Rohingya households enrolled in SAFE+2 programme activities where women, men, or both women and men decide to use transferred resources.			
% Of men in Rohingya households make decisions on the use of transferred resources.	TBD	31.2%	TBD
% Of women in Rohingya households make decisions on the use of transferred resources.	TBD	40.3%	TBD

¹⁴ SAFE II Annual Narrative Report: Annex 1: Indicator Based Performance Assessment SAFE+2 reporting period 06 July 2022- 31 December 2022

Indicators	Baseline	Mid-term	Target
% Of both men and women in Rohingya households make decisions on using transferred resources.	TBD	28.5%	TBD

Additionally, SAFE+2 provided the Rohingya communities with LPG refills, skill development training, a pressure cooker, e-voucher provision, and income-generating opportunities from skill development training. This evaluation attempted to assess the decision-making process for using these transferred resources. As per the findings, about 40.3% of Rohingya women decide to use these transferred resources, while 31.2% of men make this decision.

The Women's Autonomy Index measures the extent of women's autonomy manifested through several key dimensions, such as their access to income, mobility, freedom of expression, and others¹⁵. This programme has already provided a number of resources and training to the host community and the Rohingya Community. This evaluation also tried to measure women's condition regarding their access to income, mobility, and freedom of expression by using the women's autonomy index (See Annex 2).

Table 10: Score for the Women's Autonomy Index

Women's Autonomy Index for			
Indicators	Baseline	Mid-term	Target
(a) skills development activities in the refugee community	TBD	0.46 (out of 1.0) Or 2.3 (out of 7.0)	TBD
b) livelihood activities in the host community	TBD	0.49 (out of 1.0) Or 3.43 (out of 7.0)	TBD

As per the evaluation findings, the women of the refugee community engaged in skill development activities have a score of 0.46 (out of 1.0). The alternative description is that they have an average of 2.3 out of 7 points, meaning they are strong enough in nearly two and a half of the 7 indicators. At the same time, the average score for the host community women is 0.49 (out of 1.0), meaning that they are strong in more than 3 out of 7 indicators Please see Box 1 below.

Box-1: Assessment of Women's Autonomy Index
All the sampled respondents of Both the Rohingya and the Host community were asked about the status of 7 indicators as given below: 1- Did you (Beneficiary/selected woman) earn income in the past 12 months? 2- How much did you contribute to the HH income on average for each month in the last 12 months (in BDT)? 3- How much was your contribution in the planning income-generating activity that you were a part of? 4- How much was your contribution to the management of the income-generating activity that you were a part of? 5- How much was your contribution in execution of the income-generating activity that you were a part of? 6- Who makes the decision regarding spending the money? 7- What is the major challenge you have faced while executing the IGA? We assessed their decision-making freedom based on the 7 indicators mentioned above. We considered any response of yes or contribution in each indicator to be their freedom to make a decision.

¹⁵ <https://www.indikit.net/indicator/327-women-s-autonomy-index>

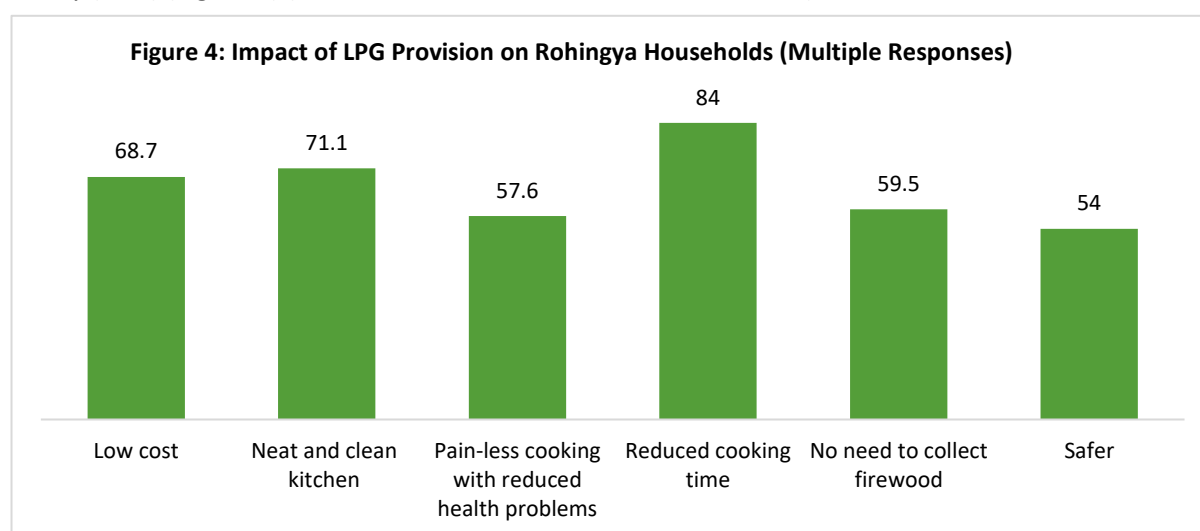
3.3 Impact of the Programme

This section has attempted to assess the effect of the programme interventions on beneficiaries, including Rohingya and the host community. This evaluation is an attempt to measure the effectiveness of organizational activities and judge the significance of changes brought about by those activities.

Impact of Programme Activities Executed under Strategic Priority 1: Cleaner Cooking Energy

All our surveyed Rohingya households are receiving LPG under this programme, while 85,000 have already received pressure cookers (See Annex Tables 10 and 11). This intervention was planned to reach an estimated 200,000¹⁶ Refugee households as direct beneficiaries. As per the UNHCR data registration after the inception of SAFE+2¹⁷. All the Rohingya households have been covered by the LPG provision, which has positively impacted the Rohingya communities in many dimensions. It is noteworthy to mention that if all the LPG-provided families are distributed pressure cookers, there could be a reduction of approximately 11.3% in LPG usage. However, the data reveals that gas savings vary across families¹⁸. So, the programme should consider taking all the target Rohingya households under the provision of pressure cookers.

According to the reporting of the surveyed Rohingya households, the impact of LPG provision on their daily lives is reduced cooking time (84%), a neat and clean kitchen (71.1%), low cost (68.7%), no need to collect firewood (59.5%), pain-less cooking with reduced health problems (57.6%), and increased safety (54%) (Figure 4) (Please see Annex Table 14 for more details).



Along with the LPG provision, as many as 85,000 of the Programme's targeted households have received pressure cookers, while 87.5% of them use them frequently as per the reporting of the surveyed refugee households. They generally use this pressure cooker an average of 6.5 times a week (See Annex Table 20).

¹⁶ Proposal: Safe Access to Fuel and Energy Plus (SAFE Plus 2)

¹⁷ Annex 1: Indicator Based Performance Assessment SAFE+2 reporting period 06 July 2022- 31 December 2022

¹⁸ Assessment Report on Pressure Cooker Use and LPG Refill Cycle Adjustment conducted by UNHCR and IUCN

“We are delighted and impressed with this LPG and Pressure Cooker, as these cooking materials, including LPG, have saved money and tension from collecting firewood. Additionally, purchasing firewood from the market costs a considerable amount of money, and collecting firewood from the forest was embarrassing for us.”

One of the FGD Participants from Rohingya Camp

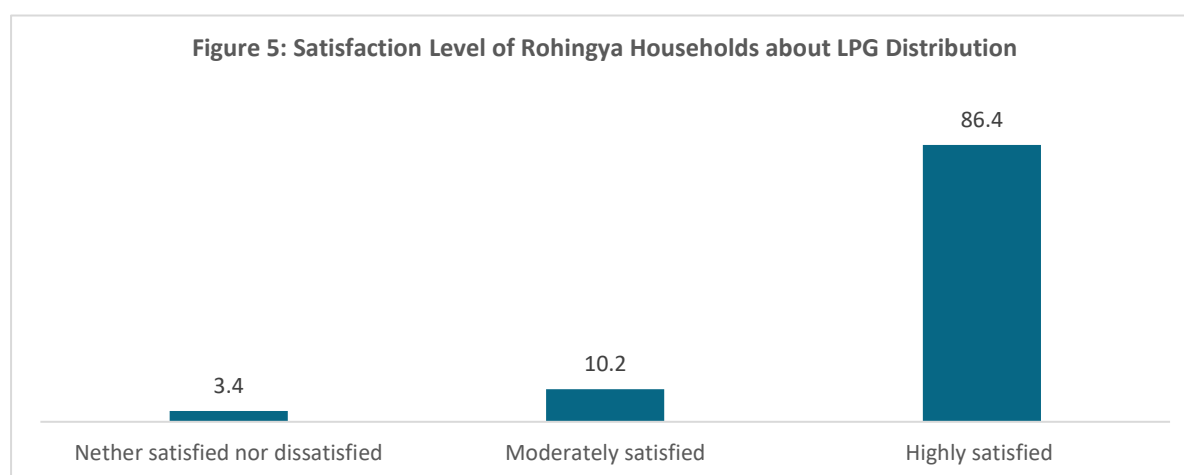
Per our FGD findings at Ukhiya and Teknaf, women and other adolescent girls and boys were primarily responsible for collecting wood from the forests and markets. However, it was always challenging for the women and adolescents collecting firewood because they sometimes became the victims of harassment and abuse. So, there was always tension among these women and adolescents. They even observed such incidents that were embarrassing for them. Another important impact is that they need not be worried about cooking even if the weather is rough or rainy because of LPG availability. A few of them have also added that cooking with a pressure cooker has saved them money and time.

“Mostly women and girls were responsible for collecting firewood from forestland and the market. So, there was always a concern about being abused, but LPG distribution has significantly reduced women’s tension and concern in this regard. Additionally, pressure cookers have helped save money, time, and cooking energy. Consequently, we hardly need to collect firewood from the forest and market.”

FGD Participants of the Rohingya Community from Teknaf Upazila

Additionally, deforestation has decreased due to using LPG instead of firewood. 13,390 Equivalent hectares of forest have been protected, while 375,300 tonnes of carbon dioxide emissions have been abated (See Table 6). However, this LPG provision has a greater impact on the Cox’s Bazar environment through the protection of forest land.

Around 86.4% of households are highly satisfied, while 10.2% are moderately satisfied with the distribution of LPG and cooking materials. Very few households (3.4%) are neither satisfied nor dissatisfied (Figure 5).



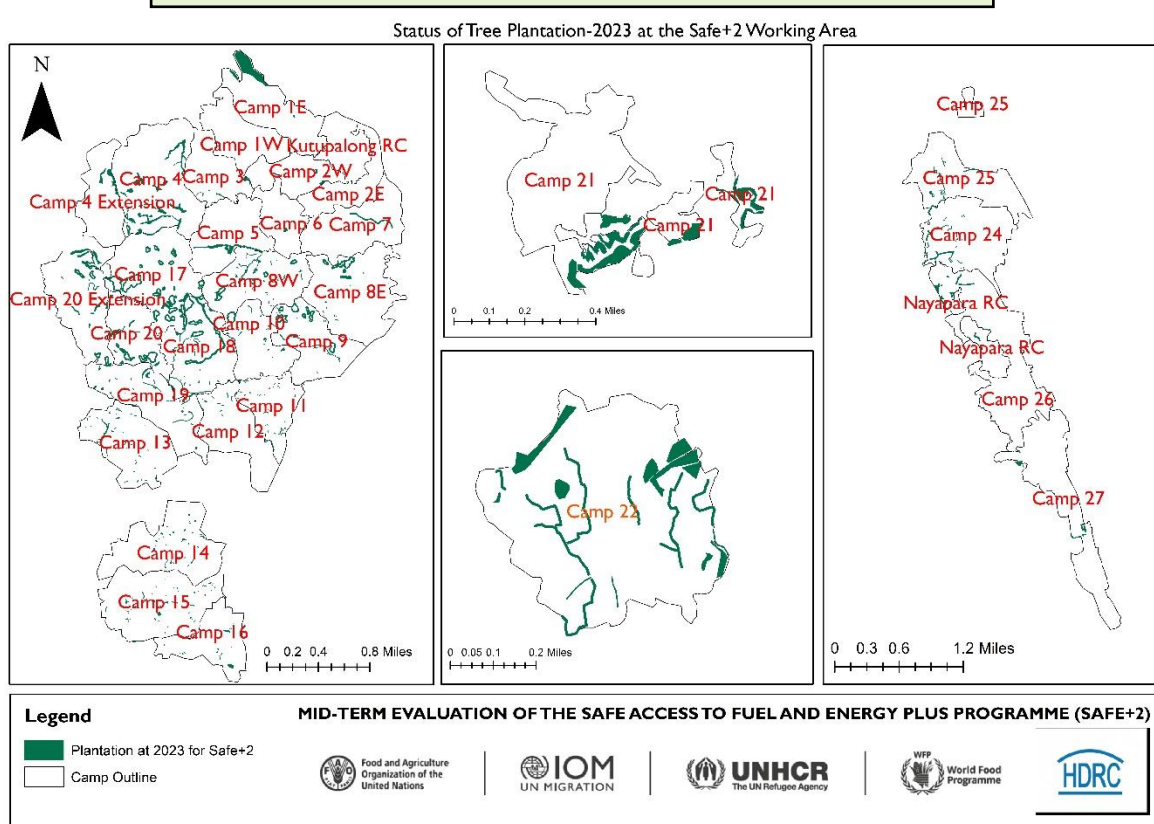
“The LPG distribution has played a vital role in reducing deforestation by decreasing the demand for firewood among the Rohingya community, which would have been cut from forest land. Thus, this programme has protected us from deforestation and carbon dioxide emissions.”

Assistant Conservator of Forests, Teknaf Upazila

Impact of Programme Activities Executed under Strategic Priority 2: Environment and Ecosystems

This intervention focuses heavily on mitigating the environmental impacts of the refugee influx and restoring the local ecosystems in refugee and host community watersheds in Cox's Bazar District. The 2017 influx of Rohingya refugees led to extensive ecological damage, mainly deforestation, due to the clearing of forest land and the terracing of hills for the refugee settlement, and the denuding of forests for firewood. More than 7,000 hectares of forest in refugee and host communities have been extremely damaged or lost¹⁹. Considering this situation, the programme's primary intention was to decrease deforestation through LPG provision to the Rohingya community. Under this strategic priority, tree plantation, including revegetation of land and slope, is also important to restore and rehabilitate the ecosystem. This intervention is working on enhancing community awareness and capacity for environmental management.

Figure 6: GIS Identification of Tree Plantation in 2022 and 2023



¹⁹ A UN Joint Project to Address Cooking Fuel Needs, Environmental Degradation and Food Security for Rohingya Refugees and Affected Host Communities (Proposal: Safe Access to Fuel and Energy Plus (SAFE+2))

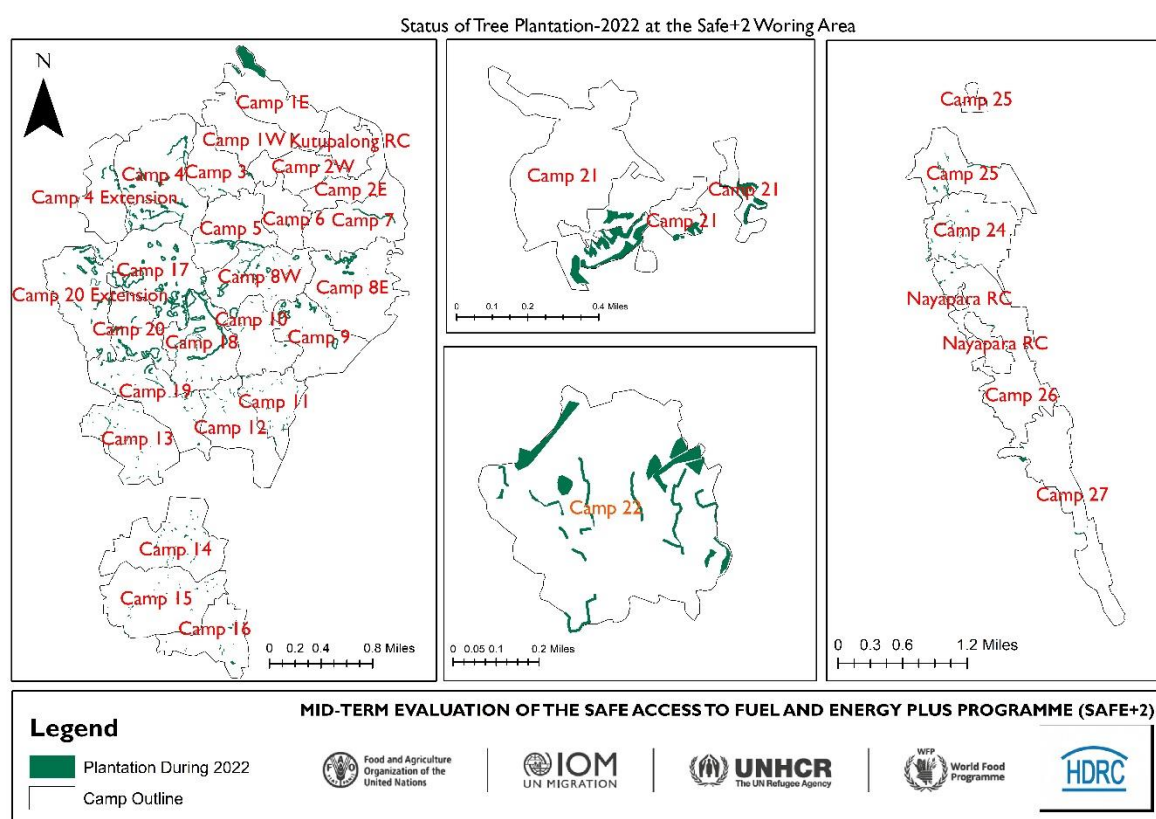
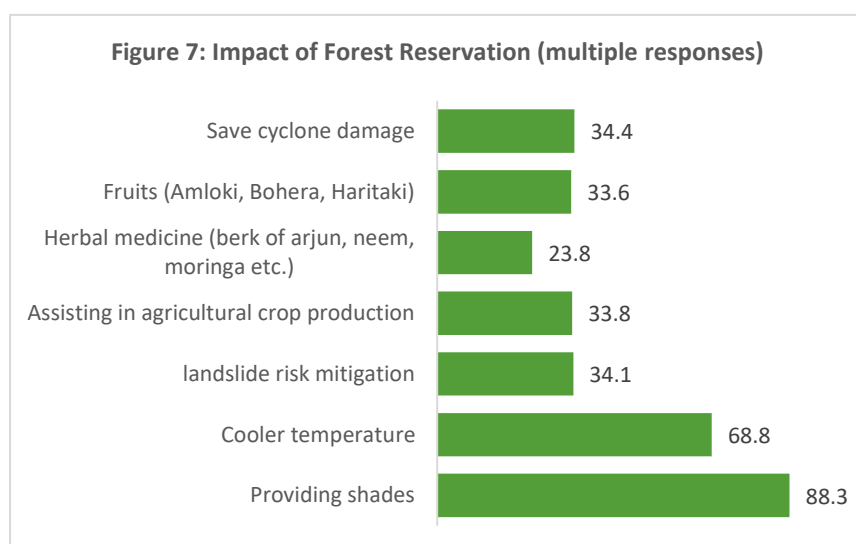


Figure 6 shows the tree plantation areas as per the camps of Teknaf and Ukhiya located under Cox's Bazar district. Green marks the places where trees were planted in 2022 and 2023. SAFE+2 partners have planted trees covering 105 hectares of land (32 hectares in 2022 and 73 hectares in 2023) during SAFE+2. As per evaluation findings, about 5.9% of the Rohingya community is engaged in the maintenance of tree plantations at a minimum cost of wages (the wage is 525 BDT for skilled persons and 350 BDT only for unskilled persons). Now, they are becoming aware of the benefits of forest reservations. In response to the opinion about the impact of forest conservation on their day-to-day life, they mentioned many options of benefits like providing shades (88.3%), cooler temperature (68.8%), slide risk mitigation (34.1%), protecting against cyclone damage (34.4%), providing fruits (33.6%) and herbal medicine (23.8%) (See Figure 7). It is also mentionable that the Department of Forest has helped this programme develop a land stabilization method, promoting the plantation of various fast-growing indigenous species and replanting in the area, which was previously national forest land.

Because of the Rohingya refugee influx in Bangladesh, our environment has already been partially damaged and is still in continuation. The tree plantation and the revegetation programme currently being executed are important initiatives to recover and restore the damage. However, this initiative is not enough for a full recovery; it is praiseworthy.

Assistant Conservator of Forests, Teknaf Upazila



As per the reporting of the surveyed Rohingya households, the conflict between the host and the Rohingya community over natural resources has decreased in the meantime. Further, the capacity of these communities to resolve this conflict has also increased. Per our findings, an average of 2.6 conflicts occurred every year, and initiatives were taken 1.2 times per conflict to

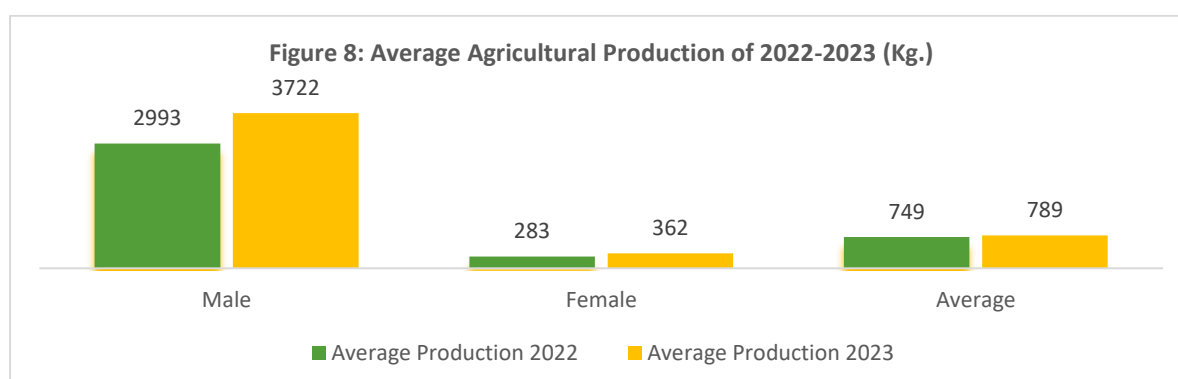
resolve those conflicts. However, most (43.5%) of the conflicts were managed by the joint coordination of the host and Rohingya community. In a few cases, CiC officers or the government (13%) took the initiative to resolve these conflicts (See Annex Table 3). As per our qualitative findings, there were many more conflicts between host and Rohingya communities in the previous years. The main reason for this conflict was to access natural resources. For example, collecting firewood from the forestland was a crucial cause of this conflict. At present, the intention of the Rohingya community to collect firewood from forestland has decreased because of getting the facility of LPG provision. They are also becoming aware of the negative impact of deforestation.

Recently, the conflict over natural resources between the host and Rohingya community has significantly decreased compared to previous years. Most of the time, host and Rohingya communities resolve these conflicts by arranging dialogue between them. Sometimes, CiC and government officials help resolve this problem.

FGD participant of Rohingya Community, Ukhiya Upazila

Impact of Programme Activities Executed under Strategic Priority 3: Resilience

Under this strategic priority, this intervention aims to increase environmentally and economically sustainable livelihood opportunities and strengthen market linkages to improve earning opportunities for vulnerable communities. As per the survey findings, this has increased communication opportunities and trust between the refugee and host communities. As a result, households have been more resilient by expanding market opportunities for local farmers and producers with their increased production and sales. Considering this, this programme has strengthened links between production in the host community and needs in the Rohingya camps (e.g., fresh vegetables), as discussed below.



As per our findings, 76.7% of our surveyed host community had received training, while this training was provided to many more women (88.9%) than men (11.1%) (See Annex Table 16). Most of the females (69.3%) received agricultural farming and homestead gardening (15.9%), poultry farming (4.5%), and tailoring (5.7%). Most males took Agriculture farming (81.8%) (See Annex Table 18).

The training provided to males and females has a noteworthy impact on increasing agricultural production. The increase in average agricultural production in 2023 (789 kg) is higher than in 2022 (749 kg), which is evidence of the impact of training on the host community. As per their reporting, the average price of this production was 37,193 Tk. in 2023 and 21,329 Tk. In 2022 (See Annex Table 5). Along with this, nearly one-fourth (24%) of our surveyed Rohingya households received IGA training, while women participants (74.6%) were higher than males (25.4%) (See Annex Table 19). As per the discussion with the Rohingya community, they ensured that most Rohingya women are engaged in vegetable production through homestead gardening. Through this production, they fulfil their food need.

“Before the Rohingya influx, we only produced rice and did not consider commercial production of vegetables. But after the Rohingya influx in Bangladesh, we started producing vegetables commercially and have had a big opportunity to sell these food products through Aggregation Centres. As a result, we are making profits. The UN Agencies have provided us with this opportunity by arranging training for us.”

Women Participants of Host Community Women, Ukhiya Upazila

3.4 Efficiency

This evaluation found that this programme achieved mentionable results within the available budget based on the activities executed in this period. However, the implementing agencies needed more funds to carry out all the planned activities. The results are visible, measurable, and logical as per the budget spent for execution at the field level.

However, the information related to budget and funding sources has been accumulated from different documents like safe access to fuel and energy plus, phase 2 (safe+2) annual programme narrative progress report reporting period: 6 July 2022 – 31 December 2022, SAFE+2 Reprioritized Activity Plan (2023 - March 2025) and technical proposal: Safe Access to Fuel and Energy Plus (SAFE Plus 2).

Source of Fund for this Programme

Evaluating the efficiency based on funding requirements and available funding at the mid-term of the programme is challenging, especially as funding under strategic priorities 2 and 3 has been shifted to 2024 for implementation. Further, a significant proportion of the budgeted activities under SAFE+2 is funded outside the programme through bilateral contributions. Until the end of 2023, under strategic priority 1, 69% of the activities have been funded outside the SAFE+2 programme, while for priority 2, 66% and under priority 3, 92% were funded outside the programme. As of December 2023, only 13% of the initially required \$282 million has been allocated through the program. To use the available funding efficiently, SAFE+2 partners have developed in 2023 a budget for prioritised activities that estimates the financial requirements at \$100 million.

Table 11: Amount of Funds Provided by the Donors until end of 2023²⁰.

Donors	Contributory Amount until 2023 (USD)
Canada	16,850,469
Sweden	7,505,322
Norway	2,822,213
Total	27,178,004

Per the Annual Programme Narrative Progress Report, the total approved budget of the entire programme is USD 282,039,934. Canada, Sweden, and Norway are the main donors to this programme. All UN agencies (FAO, IOM, UNHCR, and WFP) received \$11,438,563 from July to December 2022 and \$15,739,441 in 2023, resulting in a total of \$27,178,004 received funding until the end of 2023. Based on this provided fund, FAO, IOM, UNHCR, and WFP executed a few of the designed activities, but not all. Other implementation activities have been shifted to 2024 and 2025 from 2023.

Table 12: Amount of Funds received by the UN Agencies until 2023 from Donors

UN Agencies	Disbursement Amount until 2023 (USD)
FAO	4,168,356
IOM	9,767,050
UNHCR	9,748,261
WFP	3,494,337
Total Fund Received	27,178,004

²⁰ Funding does not include 1% MPTF administrative fee

Until the end of 2023, under strategic priority 1, 69% of the activities have been funded outside the SAFE+2 program (\$25M within SAFE+2 and \$30M bilaterally). Under strategic Priority 1, all the target Rohingya households (1,95,000) have been provided LPG refills; 85,000 households have received pressure cookers. It is pointed out that the “Assessment Report on Pressure Cooker Use and LPG Refill Cycle Adjustment” was designed to study the consumption patterns of LPG use in the camps after the distribution of pressure cookers to estimate the expected savings and adjust the refill cycle accordingly. This led to a revision of the refill cycle in summer 2023, which led to 11.3% of the total cost savings. Only UNHCR has distributed pressure cookers in 2023, and estimated savings are \$1.4 million compared to the \$1.67M procurement cost for pressure cookers, indicating an approximate cost recovery within 15 months.

Table 13: Breakdown of the Received Funds based on MPTF and Bilateral (June 2022-December 2023)²¹

Strategic Priority	MPTF (Million)	Bilateral Fund (Million)
Strategic Priority 1	\$ 25	\$ 30
Strategic Priority 2	\$ 6	\$ 23
Strategic Priority 3	\$ 3	\$ 41
Total	\$34	\$94

Under Strategic Priority 2, 79% was funded outside of SAFE+2 (\$6M within and \$23M outside). FAO and WFP executed a list of activities with a mentionable degree of achievement after the end of 2023. The main problem is that this programme did not set any baseline or target, so it is difficult to compare either with baseline or target. However, the achievements made in 2023 are visible and measurable, as shown in Table 14. It is noteworthy that some activities have been shifted for the year 2024.

Under Strategic Priority 3, 92% were funded outside the programme (\$3M in SAFE+2 and \$41M outside of the programme). the budget spending for these activities had a noteworthy impact on the achievement of increased market sales, training received by host communities, and yearly increased production, as mentioned in Table 13. It is mentionable that a few activities have been shifted from 2023 to 2024. As of December 2023, only 13% of the initially required \$282 million have been allocated.

Fund Mechanism (Multi-Partner Trust Fund and Bilateral fund), Advantages, and Challenges

Regarding the funding mechanism, it is important to note that the project's original budget (\$282M) has never officially been changed, and the reprioritised budget of \$100M identifies the cost of prioritised activities. SAFE+2 activities, as described in the programme document, are either funded through a) Multi-Partner Trust Fund (which is the funding from Canada, Sweden, and Norway - please see table below) or b) through bilateral contributions from donors directly to one of the 4 partners for specific activities or c) have not been funded at all.

A further complication is that while costs for LPG are relatively straightforward, i.e., the cost of LPG distribution to all HH in Cox's Bazar is clearly defined as monthly requirements, the activity stops if no funding is available, leading quickly to negative impacts. In comparison, costs for pillars 2 and 3 are more related to the scale of the intervention, and the activities are more flexible to be shifted or scaled up or down depending on funding. A big advantage of the Multi-Partner Trust Fund is that donors have committed to funding over the entire project period, which allows the partners to shift funding within that time frame. This is advantageous as time-bound funding (for example, leftover funding at the end of the year) can be used instead of SAFE+2 funding, which can be shifted to the next year. Due to the

²¹ Discussion with SAFE+2 programme implementers.

complex funding structure, a transparent overview of which activities are funded under SAFE+2 and bilaterally is sometimes difficult but requested by donors.

Table14: Availability of Yearly Fund for SAFE+2 in USD (2022-2025)

Donor	2022	2023	2024	2025	Total
Canada (GAC)	11,438,563	5,411,906	5,490,341	0	22,340,810
Sweden (SIDA)	0	5,784,125 (tranche 1)			
		1,721,197 (tranche 2)			
Norway	0	2,822,213	1,970,000	1,970,000	6,762,213
Total	11,438,563	15,739,441	7,460,341	1,970,000	36,608,345

Shifting of SAFE+2 Activities in 2024 from 2023

Under strategic Priority 1, LPG provision has been ongoing since 2022 and will continue for 2024 and 2025. The distribution of pressure cookers to the entire population is also under consideration and shifted to 2024. As per the secondary documents, there is a gap between the required and available budget to continue these activities until March 2025.

Under strategic priority 2, environmental rehabilitation and eco-DRR projects - technical support, plantation, and plantation materials are implemented in 2023. However, a few activities were shifted to 2024. These are:

- Strengthen community co-management approach to support forest-dependent households in dealing with conflicts over natural resources,
- Youth engagement in environmental conservation activities supported with training on project design, M&E, advocacy, organisational management, and input support.
- Developing a communications strategy to raise community awareness on protecting wildlife and natural resources,
- Preparation and dissemination of communication and IEC materials.

Furthermore, under environmental rehabilitation and eco-DRR projects, the upcoming activities for 2024-25 are:

- Technical support,
- Plantation and distributing plantation materials,
- enhancement of indigenous people's capacity for seed production.

In 2023, the programme strengthened community co-management approaches to support forest-dependent households in dealing with conflicts over natural resources. The programme plans to provide capacity development and logistics support to private, partner, and government-owned nurseries and workers in 2024 and 2025. However, there is still a gap between the required and available budget, which is necessary to execute all the activities as per the reprioritised activity plan.

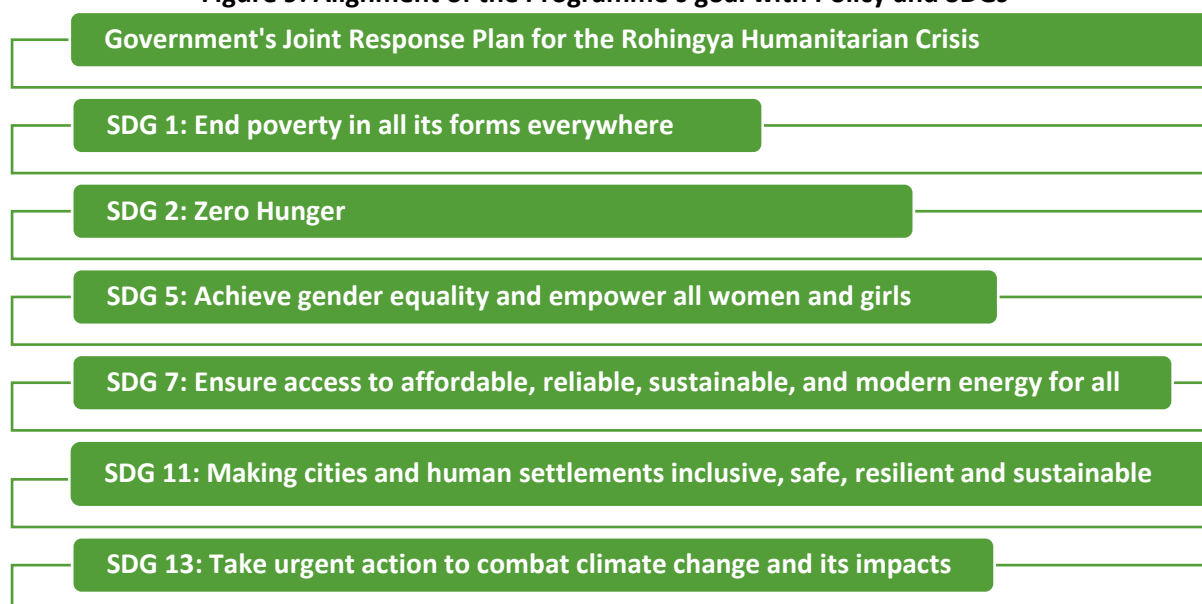
Under strategic priority 3, value chain analysis to identify green economic growth, activity on producing environmentally sustainable products and services, and establishment of linkage between on-and off-farm producer and market were executed in 2023. Based on the reprioritised activity plan, these activities are also expected to be carried out in 2024 and 2025. There will also be a budget shortage for these activities in the coming years.

3.5 Relevance and Accountability to Affected Population

3.5.1 Relevance

The project's goals, outcomes, and outputs were connected to the government's policies and strategies for improving the condition of both the Rohingya and the host communities.

Figure 9: Alignment of the Programme's goal with Policy and SDGs²²



Government's Joint Response Plan for the Rohingya Humanitarian Crisis

The Joint Response Plan for the Rohingya Humanitarian Crisis²³, developed by the Government and UN organisation, adopted five strategic objectives as a part of humanitarian responses to the Rohingya community's crisis. There were five strategic objectives.

- Strategic Objective 1: Work towards the sustainable and voluntary repatriation of Rohingya refugees/FDMNs to Myanmar.
- Strategic Objective 2: Strengthen the protection of Rohingya refugees/FDMN women, men, girls, and boys.
- Strategic Objective 3: Deliver life-saving assistance to populations in need.
- Strategic Objective 4: Foster the well-being of host communities in Ukhiya and Teknaf Upazilas.
- Strategic Objective 5: Strengthen disaster risk management and combat the effects of climate change.

Additionally, the Programme's strategic priorities are consistent with the target set under the Sustainable Development Goals (SDGs).

²² <https://www.un.org/sustainabledevelopment/climate-change/>

²³ 2023 Joint Response Plan Rohingya Humanitarian Crisis January - December 2023

SDG 1: End poverty in all its forms everywhere

All the activities designed under this programme's strategic priorities are critical to the SDG on poverty reduction. The LPG provision and pressure cooker distribution to the Rohingya community have reduced their cooking costs.

SDG 2: Zero hunger

SAFE+2 provided skill development training, leading to increased food security for Rohingya and host communities. The food production has increased.

SDG 5: Achieve gender equality and empower all women and girls.

This SAFE+2 programme has already targeted all vulnerable populations, especially women, elderly people, and persons with disabilities. According to the secondary documents, this programme has ensured 22% of female headed HH for LPG distribution. Additionally, this programme has provided LPG to 12.5% of households with at least one person with a disability and 17.1% of households with elderly people²⁴.

As high as 62.1% of women and girls reported reduced hours spent on unpaid care work due to SAFE+2 activities. Also, 31.2% of men, 40.3%, and 28.5% of both men and women make decisions using transferred resources (See Section Gender).

SDG 7: Ensure access to affordable, reliable, sustainable, and modern energy for all.

This intervention reached an estimated 200,000 refugee households as direct beneficiaries of LPG provision as per the UNHCR data registration after the inception of SAFE+2.

SDG11: Making cities and human settlements inclusive, safe, resilient, and sustainable.

This programme has aimed to improve host communities' resilience, focusing on marketing systems, the green economy, and approaches to ensure sustainability and scale-up. Under this target, this programme has taken initiatives to increase the host community's capacity. Additionally, this programme has created Farmer's Field School (FFS) and producer groups connected with established Aggregation Centres. It has also arranged market linkage workshops for the producers through Aggregation Centres. This programme has also developed a digital platform by developing an app named "farm2go" to get information about the market and production.

SDG 13: Take urgent action to combat climate change and its impacts.

LPG distribution to the 194,937 Rohingya households has saved 13,390 hectares of forest. Additionally, the use of LPG has reduced 375,300 tonnes of carbon dioxide emissions annually. This intervention has planted trees covering 105 hectares of land (32 hectares in 2022 and 73 hectares in 2023).

3.5.2 Accountability to Affected Population

UNHCR in Bangladesh, mentioned, "We need to look into how to ensure the basic needs of the Rohingyas such as food, health and protection. We need to invest in education and skills development so that the Rohingya refugees become productive members of society²⁵."

The sudden need for huge amounts of firewood and water severely impacted the host community and the environment. In response, FAO, IOM, & WFP, in association with the Canadian, Swedish,

²⁴ SAFE II Annual Narrative Report: Annex 1: Indicator Based Performance Assessment SAFE+2 reporting period 06 July 2022- 31 December 2022

²⁵ <https://www.tbsnews.net/rohingya-crisis/declining-aid-rohingyas-making-it-hard-meet-their-needs-542646>

Norwegian, British, Dutch, Japanese, Australian, Korean, and European Union governments, partnered to develop a USD 117.5 million, 3-year joint programme (June 2018-May 2021)²⁶.

The Joint Programme's primary aim is to reduce protection issues stemming from firewood collection, as well as the overall food and nutrition security, empowerment, and resilience refugee and host community households in Cox's Bazar. The programme addresses urgent cooking fuel needs through alternative energy, promotes livelihoods for host communities, empowers Rohingyas, and builds their resilience while restoring environmental damage through reforestation.

Together, SAFE+2 partners empower and build the skills of the refugee population. In the host communities most affected by the crisis, market-based livelihoods and income-generation activities will be supported to raise household incomes. FAO is supporting local agriculturalists in strengthening their production capacity for high-demand and high-nutrient crops, allowing for improved dietary consumption and increased incomes. Through its technical capacity and strong relationship with the Forestry Department, FAO has also begun a multi-year strategy of rehabilitating extensively damaged forest areas and agricultural land.

Reforestation activities are also being carried out in the damaged areas surrounding the camps and host communities through Cash for Work programmes that benefit forest-dependent poor households. The project has been recognised as an example of coordination and innovation in the response. It relies on close partnerships with government partners for implementation and the ongoing support of the development partners to meet the evolving needs of the refugee and host community population²⁷.

Undertaken by UN Agencies, the Refugee Influx Emergency Vulnerability Assessment (REVA-5) report indicates that 95% of all Rohingya households are moderate to highly vulnerable and remain entirely dependent on humanitarian assistance, similar to 2020 (96%)²⁸.

"Accountability to Affected People is an active commitment to use power responsibly by taking account of, giving account to, and being held to account by the people humanitarian organisations seek to assist" (IASC, 2015).

Accountability to affected people (AAP) is an active commitment to put vulnerable and affected people at the centre of humanitarian action. It stems from past failures of the humanitarian system to meet the needs and recognise the abilities of people affected by crises. Committing to AAP means empowering people to participate in decisions and shaping programs that affect their lives and livelihoods. A set of definitions and commitments pave the way for truly accountable humanitarian assistance now and in the future²⁹. Accountability to Affected Populations (AAP) is about using power and resources ethically and responsibly.

The Inter-Agency Standing Committee (IASC) has five commitments to Accountability to the Affected population as given below:

²⁶ <https://bangladesh.un.org/en/25179-un-agencies-address-basic-needs-rohingya-refugees>

²⁷ <https://bangladesh.un.org/en/25179-un-agencies-address-basic-needs-rohingya-refugees>

²⁸ Refugee Influx Emergency Vulnerability Assessment (REVA-5) Report

²⁹ Accountability to affected people Experiences and good practices from FAO Country Offices

Table 11: AAP's Five Commitments to Affected Population³⁰

Principles	Description
Leadership/ Governance	Demonstrate commitment by ensuring AAP is integrated into country strategies, programme proposals, monitoring and evaluations, recruitment, staff inductions, training and performance management, partnership agreements, and highlighted in reporting.
Transparency	Provide accessible and timely information on organisational procedures, structures, and processes that affect them to ensure they can make informed decisions and choices. Facilitate dialogue between an organisation and its affected populations over information provision.
Feedback and complaints	Actively seek the views of affected populations to improve policy and practice in programming, ensuring that feedback and complaints mechanisms are streamlined, appropriate, and robust enough to deal with (communicate, receive, process, respond to, and learn from) complaints about breaches in policy and stakeholder dissatisfaction.
Participation	Enable affected populations to play an active role in the decision-making processes that affect them through establishing clear guidelines and practices to engage them appropriately and ensure that the most marginalised and affected are represented and have influence.
Design, monitoring and evaluation	Design, monitor, and evaluate the goals and objectives of programmes with the involvement of affected populations, feeding learning back into the organisation on an ongoing basis and reporting on the results of the process.

It's about putting the needs and interests of the people. Community organisations serve at the centre of decision-making and ensure the most appropriate and relevant outcomes for them while preserving their rights and dignity and increasing their resilience to face situations of vulnerability and crisis. In practice, this means that people – including children and adolescents – have a say in decisions that affect their lives, receive the information they need to make informed decisions, have access to safe and responsive mechanisms to provide feedback or to complain, and have equitable access to assistance in proportion to their needs, priorities, and preferences. Affected populations are girls, boys, women, and men with different needs, vulnerabilities, and capacities who are in situations of vulnerability and are adversely affected by poverty, conflict, disasters, or other crises³¹.

UNHCR's Accountability to Affected People (AAP) is a commitment to the intentional and systematic inclusion of the expressed needs, concerns, capacities, and views of persons of concern in their diversity and to being answerable for our organisational decisions and staff actions in all protection, assistance, and solutions interventions and programmes³².

As of 2022, FAO is establishing a comprehensive and centralised grievance and feedback mechanism covering the entire programme in Bangladesh. The SOPs for the mechanism have been developed in a participatory manner and approved by the FAO Representative. Since 2018, FAO has been enhancing the livelihoods and resilience of Rohingya refugees and host communities through appropriate, market-driven inputs and training opportunities. Environmental impacts are being mitigated through reforestation, land stabilisation, and restoration of the natural resource base. Community-based

³⁰ The essential linkages between Accountability to Affected Populations (AAP) and Prevention of Sexual Exploitation and Abuse (PSEA) by IASC (Source):

https://interagencystandingcommittee.org/sites/default/files/migrated/2015-12/aap_psea_2-pager.pdf

³¹ Accountability to Affected Populations: A handbook for UNICEF and partners.

³² Operational Guidance on Accountability to Affected People (AAP) by UNHCR September 2020.

disaster risk reduction (DRR) activities are implemented through cash-for-work programmes to mitigate natural hazards and provide income sources³³.

In response to the accountability to the affected population, IOM adheres to the IASC understanding of AAP, which defines it as “an active commitment by humanitarian actors to use power responsibly by taking account of, giving account to, and being held to account by the people they seek to assist³⁴.

In WFP, accountability to affected populations is considered a cross-cutting issue. This means that WFP sees AAP as an issue informing all aspects of its response. Examples of AAP initiatives are found in all types of programmes and contexts, from emergency operations to country programmes, and both formal and informal avenues for engaging affected communities are utilised. WFP is accountable not only for achieving results but also for how programmes are implemented. Issues related to staff conduct, prevention of fraud and sexual exploitation and abuse, and humanitarian protection and gender are all a part of the AAP³⁵.

It is also evident that all the implementing partners are implementing the planned activities at the field level, taking leadership roles. For example, IOM and UNHCR provide LPG and pressure cookers (only UNHCR) to the Rohingya households under strategic priority 1: Access to Cleaner Energy. They have successfully covered nearly all the vulnerable populations like elderly people, female-headed households, and persons with disabilities. SAFE+3 partners are engaged in tree plantation under strategic priority 2: Environment and Ecosystem. Finally, FAO and WFP are also implementing activities planned under strategic priority 3: Resilience. After contextual analysis and realizing the challenges and social and environmental consequences caused by the Rohingya influx, these organizations prioritized their activities as per the needs of Rohingya and host communities after having dialogues with the representative of the Government, community people, and the other NGOs. These planned activities are evidently helping restore the environmental and ecological system and increase the resilience of the host and Rohingya community and skill development capacity. As a part of monitoring and evaluation, this program has already conducted a few types of research to realize the effectiveness, outcomes, and impact of the activities already executed at the field level to adjust the feedback and complaints provided by the targeted population. Finally, the programme has also ensured the participation of the mostly affected population, as presented in Figure 10.

As per the evaluation, all the implementing partners have successfully followed the AAP framework, from designing the programme’s proposal and activities to executing these activities at the field level. As per the discussion before, this programme has successfully responded to the affected population, including displaced Rohingya refugees and the surrounding host community affected by the Rohingya influx, including women, girls, children, Persons with disabilities, and elderly people. This evaluation found that the accountability of the UN implementing agencies toward the affected population was active, effective, visible, functional, and responsive.

³³ Accountability to affected people Experiences and good practices from FAO Country Offices

³⁴ Accountability to Affected Populations Framework published by IOM.

³⁵ Accountability to Affected Populations (AAP) Engaging Affected People by World Food Programme (WFP) (<https://wfp-unhcr-hub.org/wp-content/uploads/2023/10/WFP-0000013057.pdf>)

Figure 10: The programme's Accountability to Affected Population**Strategic Priority 1: Cleaner Cooking Energy**

- 99.8% of the total (vulnerable) Rohingya population received LPG refills of its programme target population
- 22% female-headed HHs taken under the LPG provision
- 2% of target HHs have PWDs
- 11.7% 13% of target HHs have elderly people

Strategic Priority 2: Environment and Ecosystems

- Partners have planted trees covering 105 hectares of land
- 5.9% of the Rohingya community is engaged in the maintenance of tree plantation at a minimum cost of wages
- 30.4% Of conflicts over natural resources are successfully managed

Strategic Priority 3: Resilience

- 36.3% of farmers and producers with increased market sales.
- 88.9% females and 11.1% males received agricultural training
- The average production was 789 kGs in 2023 and 749 kGs in 2022

Gender: Cross-cutting Issue

- 62.1 % approximate number of women and girls (individuals) who report reduced hours spent on unpaid care work due to SAFE+2 activities.
- 31.2% of men in Rohingya households make decisions on the use of transferred resources.
- 40.3% Of women in Rohingya households make decisions on the use of transferred resources.
- 28.5% Of both men and women in Rohingya households make decisions on the use of transferred resources.

3.6 Programme's Durability and Exit Strategy

The duration of SAFE+2 is 36 months, from 01 April 2022 to 31 March 2025. Since its inception, this programme has been running for one and a half years. To achieve the expected result, several reprioritised activities under the designed outcome indicators based on three strategic priorities were executed. This programme encompasses emergency-responsive activities addressing the lifesaving needs of the targeted population. The activities being executed have a long-term socio-economic and environmental impact on the host and Rohingya communities.

For example, LPG distribution has provided security to reduce their cooking cost, health hazards, deforestation, cooking time, conflict with host communities, and carbon dioxide emissions. Similarly, these interventions have also helped land/ecosystems be rehabilitated in Cox's Bazar and develop the capacity of the host and Rohingya community to resolve conflicts over natural resources. Lastly, these interventions have also helped build resilience among host and Rohingya communities by providing agricultural and income-generating training.

So, a sustainable exit strategy must be developed to ensure all the benefits of the programme are maintained. Otherwise, a sudden exit without sustainable or effective planning might have devastating consequences not only for the host and Rohingya communities but also for the environment and ecology of Cox's Bazar district. The preconditions to consider when developing a sustainable exit plan are below.

- The programme should ensure the LPG distribution to the host community in alignment with the government or other international organisations with a subsidised donation even after the project.
- These interventions should continue the LPG refill distribution until the Rohingya communities develop the financial ability to purchase LPG for cooking.
- This programme should try to enhance the capacity of host communities by providing either skill development training or agriculture-based training. Agricultural training should be provided to participants with cultivable land or the opportunity for homestead gardening, while skill development training should be provided to landless people.
- Skill development training should be provided to both the host and Rohingya community. This programme should concentrate on finding a way for the Rohingya to manage two-thirds of their daily costs using this IGA training.
- Community awareness programmes should be arranged regularly for the host and Rohingya community. General knowledge about the restrictions and laws for the Rohingya community and disaster risk reduction should be highly focused as part of awareness.
- Community awareness programmes should always be arranged for the host community regarding assistance to the Rohingya community and what training they received. The market linkage should be strengthened for the host community.
- Tree plantations should be executed nearer or within the camps where deforestation is a serious issue. Watershed management and ecosystem rehabilitation should be planned with the government with a clear target.

Section 4: Challenges, Key Considerations, and Lessons Learned

4.1 Lesson Learned

Table 12: Lesson Learned, Best Practices, and Key Success Factors

Areas	Lesson Learned	Success Factors
Cleaner Cooking Energy	- LPG distribution is the most optimum solution for cooking fuel in Cox's Bazar. All the Rohingya households use LPG as the best cooking option instead of firewood. - LPG use and pressure cookers have helped decrease cooking time, providing security for more cooking days. As a result, the use of firewood has reduced.	- All the Rohingya households are satisfied with the LPG provision. - It is proven that the use of LPG has helped reduce deforestation and carbon emission.
Environment and Ecosystems	- The roadside tree plantation has been an effective initiative for restoring the environment. Rohingya's engagement in maintaining and caring for the forest land has allowed them to earn cash. - This programme's initiatives to resolve conflicts over natural resources are effective, as most of the surveyed Rohingya and host communities reported that conflicts have decreased recently.	- Rohingya households are satisfied with engagement in caring for the forestland and tree plantation. - Both the Rohingya and host communities are not interested in conflicts over natural resources.
Resilience	Training, awareness, support, and market linkage mechanisms can help increase agricultural production.	The overall agricultural production has increased in 2023 than in 2022. Women's participation both in training and production has increased.
Aggregation Centre	This programme has established this Aggregation centre as a facility for aggregation, storage, processing, distribution, and marketing of locally or regionally produced food products".	- Of the 20 aggregation centres, 13 have already been registered, and others are in the process of registration. - Most local producers sell the products they produce through these centres.
Gender Mainstreaming	- This intervention has provided LPG to a mentionable portion of female-headed households, elderly people, and persons with disabilities. - Women's inclusion in training might increase agricultural production.	- The women autonomy index shows that employees have more freedom or ability to make decisions about nearly three of five indicators. - About two-fifths of the Rohingya women can make decisions on using transferred resources.

4.2 Challenges and Key Considerations

Table 13: Area-wise list of Challenges and Key Consideration Issues

Areas	Challenges	Key Considerations
Cleaner Cooking Energy		
LPG Distribution	All the households getting LPG are satisfied with this provision. Nearly two-thirds of the households use alternative energy like firewood, borrowing gas from others, and purchasing gas. It would be challenging for this programme to stop LPG distribution without managing an alternative. It might have a huge negative impact on not only the Rohingya community but also the environment.	There should be a clear exit option assuring an uninterrupted LPG supply even after the programme ends.
Pressure cooker	Nearly half of Rohingya households have yet to get a pressure cooker. Most households generally use pressure cookers, but the frequency can be increased. However, increasing the frequency of use of pressure cookers among the Rohingya is challenging to achieve better output under this programme.	This programme should try to increase the frequency of pressure cooker use among households.
Environment and Ecosystems		
Environment rehabilitation and eco-DRR projects -	This project has taken so many activities under implementation, like revegetated land, slope revegetated, streambank rehabilitation and maintenance, slope stabilisation, drainage improvement, and tree plantation. Finally, it has implemented only tree plantation.	The programme should assess these planned activities and determine which activities are essential to execute in the current context. Additionally, this programme should be concerned about the shortage of funds.
Conflict over Natural Resources	This programme has many planned activities, such as conflicts over natural resources, including the human-elephant conflict and snake rescue. However, it has failed to execute all the activities as intended, making it difficult to achieve the result.	Conflict over natural resources might be a burning issue for the host and Rohingya community. The primary task should be to build up the capacity of these communities to resolve these conflicts.
Resilience		
Market Linkage Development and Aggregation Centre	This programme has executed a few activities out of all the planned activities but has already completed half of its project timeline. The executed activities are the development of FSS guidelines, making 13 Aggregation centres registered out of 20, arranging exchange	Now, this programme should be more realistic about reprioritising its outcomes and activities, which will ultimately be achievable.

	visits among the agents of aggregation centres, E-farmer's platform development, and livelihood programme. There are a total of four outcomes under 3A, but there are many activities that have yet to be done. It would be challenging for this programme to achieve an effective result by executing these activities within the duration of the project.	
	Aggregation centres are mainly used for aggregating, storing, processing, distributing, and/or marketing locally or regionally producing food products. Some host communities are connected with these centres, but not as high as expected. It is a challenge for this programme to make these centres more effective for market linkage.	- Creating awareness among the host community - Inclusion of women in this centre more effectively - Many of the community members took training, but many of them are not functionally connected to these centres.
Shortage of Fund	It is clear that funds are uncertain for many of the planned outcomes and activities. Activities are expected to be executed if funds are available. As a result, most planned activities were not executed in this period.	Reprioritization of outcomes, outputs, and activities per the available budget. This consideration should be given to the more focused areas within the budget available for the rest of the programme.
Engagement of Women in Production	More women received agricultural training than men. The evaluation also shows that their engagement in production increased in 2023 than in 2022. After receiving training, a greater part of them remains inactive, especially in production. So, there is potential for creating more resilience among women by engaging them in the production process and market linkage.	- Providing more support for women in production as per their needs - Considerations for many more women's involvement in market linkage through Aggregation Centres

Section 5: Conclusion and Recommendations

The Safe Access to Fuel and Energy (SAFE+ 2) programme was initiated in 2022 in coordination with the GoB, international donors, and FAO, IOM, UNHCR, and WFP to meet the immediate need for practical, safe, and sustainable cooking fuel essential to food security through the provision of LPG, mitigate deforestation, rehabilitate impacted environments, and foster greater social cohesion between refugees and host communities through livelihoods and skills development. In parallel, UNHCR undertook coordinated energy, environment, and resilience interventions in its area of Responsibility.

This evaluation attempted to assess the degree of achievements per the objectives and outcome indicators designed for this programme. Under the developed indicators, this programme executed a list of activities based on the availability of funds. Despite achieving this, this programme needs to perform many activities in the rest of the months to reach the final goal. The recommendations that the implementing agencies can follow for the rest of the months are given below.

Strategic recommendations:

Contingency Plans and exit strategy: Conduct a risk analysis of the project to identify risks and scenario planning, especially regarding funding reduction, assess their severity, and develop mitigation measures. Establish a contingency mechanism to address unforeseen challenges, with regular revisions as needed to adapt to evolving circumstances and funding landscape. Sustain and diversify funding sources, maintaining a balance between addressing immediate humanitarian needs and long-term developmental concerns. Develop an exit strategy, particularly for strategic priority 1: provision of clean cooking energy.

Enhance sustainability: Advocate with the Government of Bangladesh, showcasing the macroeconomic benefits of involving Rohingya refugees, particularly women and youth, in income-generating activities. Engage donors and partners in policy advocacy initiatives. Explore climate action funding sources to secure more sustainable funding streams. Develop livelihood activities tailored for refugee women to be implemented at the family and block levels within the camps, enhancing their empowerment, safety and reducing social stress.

Gender Analysis: While the LPG distribution covers the entire population, prioritize a gender-focused approach across all three strategic priorities of the project. Conduct additional analysis on the role of women in cooking and fuel collection, plantation activities, and livelihood pursuits to inform targeted interventions and support gender equality objectives.

Focus Areas	Operational Recommendations
Access to Cleaner Cooking energy	• All households should be provided with pressure cookers to minimise the cost of cooking and the use of firewood.
	• Rohingya households should receive refresher training on the use and benefits of LPG and pressure cookers.
	• Community awareness interventions should be provided to the host and Rohingya communities, focusing on the reasons for environmental damage and its devastating impact on us and steps that need to be taken to restore the environment at the individual and community levels.
Environment and Ecosystems	• Community awareness interventions should be provided to the host and Rohingya communities, focusing on the conflict of natural resources and how to solve the problems mutually. This programme may develop a mechanism-chain for resolving these conflicts.
	• This programme should ensure many more women's engagement in food production with a robust monitoring system.
Resilience	• This intervention should take more initiatives to strengthen the Aggregation Centre effectively by increasing the production of both males and females and enhancing their capacity.
	• The programme should strengthen the e-commerce platform by popularising the Farm2Go App.
	• The programme should reprioritise the activities per the budget available to the implementing agencies. Many activities should be deducted from the planned activities as per the requirements.
Reprioritising the Activities	• This programme should set the baseline value and the targets as early as possible to measure its final goal and impact.
Programme Target Setting	• This programme can replicate the findings of lessons learned and best practices in other areas.
Aligning the Lesson Learned and Best Practices	• The MPTF and bilateral fund model is efficient but has some disadvantages to implementing the activities at the planned timeline. To avoid this problem, the program should reprioritise the activities as per the timeline and availability of funds to achieve the target at the end of the program.

Final Report

Impact Assessment of Pressure Cooker Distribution in Rohingya Refugee Camps – Post Pilot Phase



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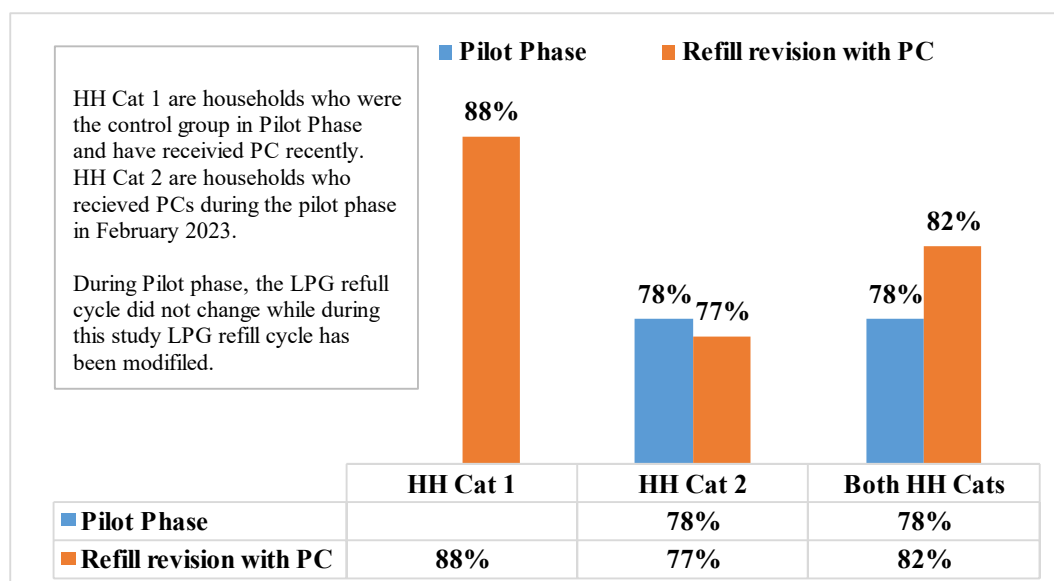
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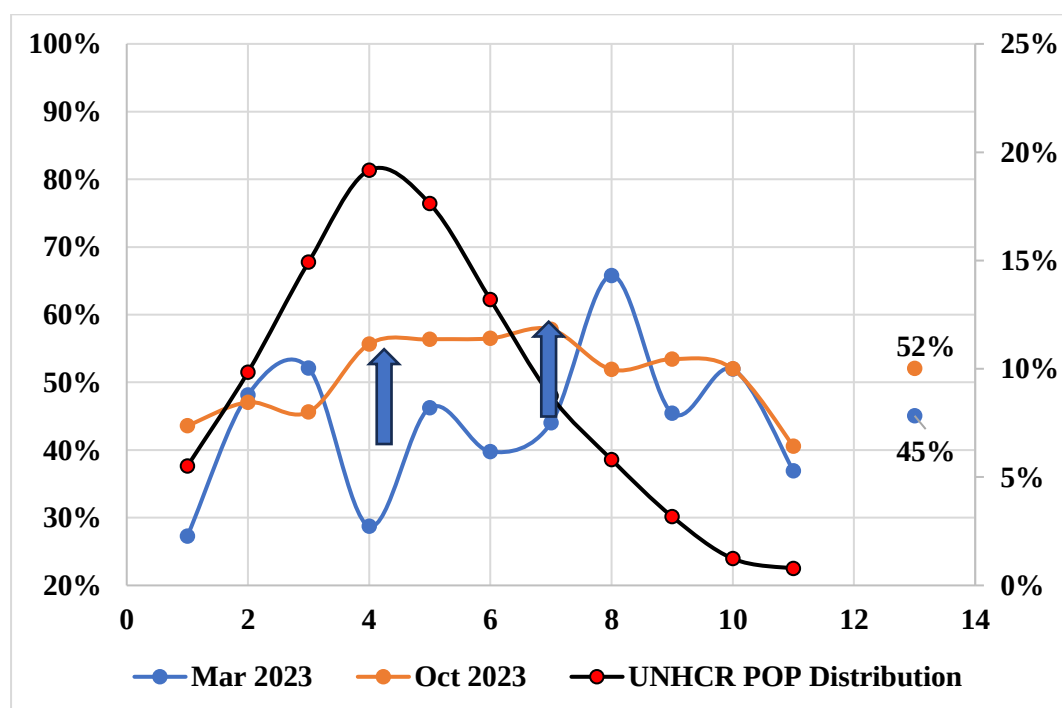
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Executive Summary

1. Since 2018, a crucial initiative has been underway, led by the United Nations High Commissioner for Refugees (UNHCR) and the International Organization for Migration (IOM). The initiative involves providing Liquid Petroleum Gas (LPG) to nearly 200,000 households of Rohingya refugees residing in the Teknaf and Ukhiya refugee camps. The primary objective is to ensure a stable supply of cooking fuel while mitigating the demand for firewood from the stressed forests in the region. This initiative has yielded significant results, with an 80% reduction in the demand for firewood, as highlighted in the 2019 IUCN report.
2. To sustain this provision, a substantial amount of LPG is required, presenting a significant operational challenge and consuming a considerable portion of the allocated funds for refugee support. Recognizing the imperative for efficiency in LPG utilization, the UNHCR took a strategic initiative in 2020 to distribute pressure cookers in two selected camps (camp 2W and 8E) and conducted a pre-pilot study to assess the impact on gas consumption. Subsequently, in 2022, the project was expanded, distributing pressure cookers to nearly 6,000 households in camp 4 extension and camp 27. Tailored solutions were implemented during the distribution to address the diverse needs of different household groups. For instance, households with 1-3 members received a 5-liter pot each, 4-5 member households received a 6-liter pot, 6-7 member households received a 6.5-liter pot, and households with 8 or more members were supplied with a 7-liter pot each.
3. In September 2023, UNHCR took a significant step by instituting a substantial revision to the LPG refill cycle policy followed by **a) distribution of a pressure cooker to every refugee family within their camps, and b) intensive awareness on using pressure cooker through i) continuous streaming of training videos at the distribution centres and ii) block-based initiatives aimed at promoting the effective use of pressure cookers.** By the end of 2023, all households in the UNHCR-managed camps received one pressure cooker each. This strategic move aimed to optimize resource usage and enhance the cooking efficiency of households in these communities.
4. Given that the current study involves revisiting the same households included in the pilot phase, the anticipated sample size is approximately 1,276, with 622 households in Camps 4X and 27, and 654 households in Camps 4 and 26. These households were initially chosen through a random selection process in the pilot phase. However, it is noteworthy that, in the end, only 1,070 households were actively monitored for the use of pressure cookers in these camps.
5. The breakdown of these monitored households is as follows: 541 of these families, who were originally part of Camps 4 and 26 and received pressure cookers for the first time during this phase, constituted the control group during the pilot phase. In contrast, 529 families from Camps 4X and 27, who previously received pressure cookers during the pilot phase, were the original treatment group and are also monitored in this phase to assess the impact of refill changes along with an intensive campaign program. The following table provides a summary of our sample composition.
6. During the pilot phase, only 78% of households that received pressure cookers utilized them at least once within the two-week monitoring period. In contrast, the current study, with its new campaigns, reflects an increased adoption rate, with 88% of households utilizing pressure cookers during the same monitoring period. This stark contrast highlights the positive impact of the new campaigns and the modified refill cycle on encouraging the use of pressure cookers among refugee households.



7. Moreover, the data reveals a compelling correlation: households that utilized a pressure cooker for more days during the 14-day monitoring period exhibited a higher usage rate. This indicates a gradual increase in pressure cooker use rate as they gain more experience—an observation that reflects a growing sense of familiarity and ease of using pressure cooker among individuals. Figure 10 also illustrates that the use rate in the October survey surpasses that of the March survey, suggesting an improvement in pressure cooker use rate coinciding with the introduction of the pressure cooker, a new refill cycle, and an associated campaign (the trendline has shifted up in October survey compared with the March survey).
8. The current survey indicates a significant increase in the utilization of pressure cookers among families with sizes ranging from 2 to 8. This positive trend is visually depicted in the following figures.



9. Using the current rate of use of LPG by family groups, Table 10 shows, for example, that while a household of four to five members, for example, typically requires 284g of LPG per day, they are receiving an average of 280g per day. Using a normal distribution, we estimate that nearly 45% of the household in this family group will encounter shortages of LPG before their next refill cycle. However, at the same time, it is also true that 56% of the families will not encounter any shortage before their next refill date.

LPG groups	per day use of LPG (gm)	Per day allocation in a refill cycle (gm)	Shortage / surplus in days within a refill cycle	Percent of HH with shortage / surplus of LPG
1-3 HH size	258	245	2.3	44.8%
4-5 HH size	284	280	0.6	45.5%
6-7 HH size	332	316	1.8	46.3%
8-9 HH size	384	375	0.7	47.9%
10-11 HH size*	443	462	1.1	48.1%
12 and above HH size*	505	522	0.8	47.7%

NOTE: * **red colored** text means surplus – households on average received more gas than what they need.

10. Using a regression analysis to the study team assessed the net savings in LPG under three distinct scenarios: a) baseline, b) scenario I and c) scenario II. These are described below.

Scenario	Assumptions
Baseline or Business-as-Usual Scenario	Households do not need to change their current cooking or social behaviour
Scenario I – No allocation of LPG for guests	There are significant number of guests within the Rohingya families who visit each other from neighbouring camps. Since total number of persons are same, this scenario assumes that LPG allocation will not include allocation of gas for their guests.
Scenario II – rice is cooked with PC only	Households cooked 2-3 times rice for their meal. However, data shows that they do not cook these rice with PC yet. This behaviour can be modified and if all the time, rice is cooked with PC there will be further room for improvement and hence saving LPG.

11. Based on the regression model, the study estimated the refill cycle for all family sizes. The results revealed nearly 14% savings in LPG under Scenario I and about 18% savings in LPG under Scenario II.

Family Size	No of days per cylinder			
	Current refill cycle (in days)	Refill cycle based on BAU scenario	No LPG allocation for Guests (Scenario I)	No LPG allocation for guests and 100% PC use for rice cooking (Scenario II)
(1)	(3)	(4)	(5)	(6)
1	49	46	49	49
2	49	49	52	53
3	49	45	47	49
4	43	44	45	47
5	43	41	43	45
6	38	37	39	40
7	38	35	36	38
8	32	32	33	35
9	32	30	31	32
10	26	28	28	29
11	26	27	27	28
12	23	24	25	26
13	23	23	23	24
14	23	21	22	23

12. The study recommends implementing the Scenario I-based refill cycle for all family sizes except for families of size 1, who are mostly PSN (Persons with Special Needs). In the long run, the study recommends developing an incentive mechanism to switch to the Scenario II-based new refill cycle.

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1.1 Background of the Study

Since 2018, a crucial initiative has been underway, led by the United Nations High Commissioner for Refugees (UNHCR) and the International Organization for Migration (IOM). The initiative involves providing Liquid Petroleum Gas (LPG) to nearly 200,000 households of Rohingya refugees residing in the Teknaf and Ukhiya refugee camps. The primary objective is to ensure a stable supply of cooking fuel while mitigating the demand for firewood from the stressed forests in the region. This initiative has yielded significant results, with an 80% reduction in the demand for firewood, as highlighted in the 2019 IUCN report.

The continuous provision of LPG is imperative due to several factors. Firstly, there is a scarcity of alternative cost-effective fuels to meet the substantial demand arising from over one million refugees. Secondly, the refugees in Cox's Bazar face limitations in generating income or moving outside their localities, hindering their ability to purchase fuel from local markets. Thirdly, the provision of LPG not only addresses cooking needs but also aligns with the critical priority of safeguarding adjacent forest ecosystems by government and refugee assistance organizations.

To sustain this provision, a substantial amount of LPG is required, presenting a significant operational challenge, and consuming a considerable portion of the allocated funds for refugee support. Recognizing the imperative for efficiency in LPG utilization, in 2020, the UNHCR took a strategic initiative of distributing pressure cookers in two selected camps (camp 2W and 8E) and conducted a pre-pilot study to assess the impact on gas consumption. Subsequently, in 2022, the pilot of the project was initiated, distributing pressure cookers to nearly 6,000 households in camp 4 extension and camp 27. Tailored solutions were implemented during the distribution to address the diverse needs of different household groups. For instance, households with 1-3 members received a 5-liter pot each, 4-5 member households received a 6-liter pot, 6-7 member households received a 6.5-liter pot, and households with 8 or more members were supplied with a 7-liter pot each.

The findings from the pilot survey on the utilization of pressure cookers indicated a significant potential for increasing the efficient use of LPG in the camps if families incorporate pressure cookers in the preparation of major meals. Consequently, the report proposed a substantial revision of the LPG refill schedule tailored to various family sizes. The pilot survey additionally revealed that with these measures in effect, a minimum of 7.7% reduction in LPG consumption is anticipated, and this figure could potentially rise to 14.6% with increased adoption of pressure cookers in meal preparation among refugee families. To achieve this, the study recommends placing particular emphasis on smaller families (up to 6 members), which form the majority in the refugee community. Furthermore, the research emphasizes the importance of ensuring that the designated family cook is proficient in using pressure cookers, suggesting the implementation of a campaign in each camp to promote proper usage.

Based on the findings of our pilot phase study, UNHCR has updated the refill cycle for households that received pressure cookers. The revised schedule (currently in place) tailored by family sizes, is outlined in Table 1. The study also highlighted a low adoption rate of pressure cooker usage among households with 2 to 6 members, which represent most of the refugee population. As such, it recommended to monitor these households closely and in addition, launch a more intensive campaign aimed at increasing their adoption rate. Doing so is likely to result in greater savings in LPG.

Table 1: Current Refill Cycle for Refugee Households

Family Size	Revision Refill Cycle in days
1-3	49
4-5	43
6-7	38
8-9	32
10-11	26
11 and above	23

The New Initiative

In September 2023, UNHCR took a significant step by instituting a substantial revision to the LPG refill cycle policy followed by **a) distribution of a pressure cooker to every refugee family within their camps, and b) intensive awareness on using pressure cooker through i) continuous streaming of training videos at the distribution centres and ii) block-based initiatives aimed at promoting the effective use of pressure cookers.** By the end of 2023, all households in the UNHCR-managed camps received one pressure cooker each. This strategic move aimed to optimize resource usage and enhance the cooking efficiency of households in these communities.

The implementation of these changes is not merely procedural; it is a deliberate effort to address the specific needs of varying family sizes while also promoting sustainable and efficient cooking practices within the refugee camps. This particular survey serves as a crucial follow-up, seeking to gauge the tangible impact of introducing pressure cookers in these communities, assessing changes in consumption patterns, and gathering insights on the overall well-being of the refugee families.

1.2 Objective of the Research

The primary objective of this study–

- (a) To examine the change in the pressure cooker uptake rate (adoption rate) among the refugee families
- (b) To estimate the average LPG consumption per day per household given the revisions in the refill cycle along with a more intensive campaign to promote adoption of pressure cooker for cooking at the block-level.
- (c) To provide recommendations on refill cycle adjustments based on family size

This assessment aims to uncover valuable insights into how the introduction of pressure cookers has influenced cooking practices, resource utilization, and overall efficiency in preparing meals. The study's overarching goal is to go beyond data collection and statistical analysis. It aspires to offer a holistic understanding of the dynamics surrounding LPG consumption, considering the nuances of varying family sizes and their corresponding refill cycles. By delving into these intricacies, the research aims to present a nuanced perspective on the effectiveness of the revised LPG refill schedule and the provision of pressure cookers.

Ultimately, the study seeks to translate its findings into actionable recommendations. These recommendations are geared towards enhancing fuel efficiency, reducing costs, and promoting sustainable cooking practices within the unique context of refugee communities.

2.1 Research Design

The current study is an extension and expansion of the pilot phase study, which was initially conducted in Camps 4, 4X (Extension), 26, and 27, all of which are under the management of UNHCR. During the pilot phase, pressure cookers were distributed to Camps 4X and Camp 27. In this subsequent phase, additional pressure cookers were distributed in Camps 4 and 26 as well as in all other UNHCR-managed camps.

It is important to note that in this phase, all households within camps received pressure cookers, leading to the absence of an effective control group. To address this challenge and ensure the validity of the measurements of gains, a strategic approach has been devised. This strategy involves careful consideration of various factors and methodologies to establish a robust framework for evaluating the impact of the introduced interventions. By implementing this strategy, the study aims to overcome the absence of a control group and ensure that the measurements of gains are credible and meaningful.

Approach 1: The households previously surveyed during the pilot phase were revisited for a follow-up survey.

Approach 2: The control group identified in the pilot phase (Camp 4 and Camp 26) retained as the foundational group, but during this phase, they turned into a new treatment group.

Approach 3: The initial treatment group from the pilot survey (in Camp 4X and Camp 27) was also surveyed to assess whether there have been any changes in their behaviour because of large scale introduction of pressure cooker in this phase within the UNHCR-managed camps.

Based on this, the impact of introduction of pressure cooker in the UNHCR-managed camps is assessed using the analytical framework presented in Table 2.

Table 2: Impact Table for Analysis

Camps	Pilot Phase Survey	Current Survey	Impact
Camp 4 and Camp 26	Control Group (C) (old refill cycle and no pressure cooker) 	Treatment Group (T2) (new refill cycle + new pressure cooker + campaign on PC use) 	Change measures net savings due to changes in the refill cycle and introduction of pressure cookers with intensified awareness campaigns on PC use (T2C) [on same cohort]
Camp 4X and Camp 27	Treatment Group (T1) (old refill cycle + pressure cooker) 	Treatment group (T3) (new refill cycle + pressure cooker + intensified campaign on PC use) 	Change measures the impact of refill cycle change with intensified campaign on PC use. (T3T1) [on same cohort]

It is crucial to examine the difference between T1 and T3 (labelled as T3T1), as this comparison specifically aims to discern the potential impact on families already utilizing pressure cookers due to a revision in the refill cycle along with intensified campaigns promoting the use of pressure cookers to save LPG. On the other hand, T2C represents a comparison between the same households who received the pressure cooker for the first time and were exposed to intensive pressure cooker use campaigns along with a change in their refill cycle.

2.2 Sample size

Given that the current study involves a revisit to the same households included in the pilot phase, the anticipated sample size is approximately 1,276, with 622 households in Camps 4X and 27, and 654 households in Camps 4 and 26. These households were initially chosen through a random selection process in the pilot phase. However, it is noteworthy that, in the end, only 1070 households were actively monitored for the use of pressure cookers in these camps.

The breakdown of this monitored households is that 541 of these families, who were originally part of Camps 4 and 26 and received pressure cooker for the first time at this phase while they constituted the control group during the pilot phase. In contrast, 529 families from Camps 4X and 27, who previously received pressure cooker in the pilot phase were the original treatment group, are also monitored in this phase for assessing impact of refill changes along with an intensive campaign program. The following table provides a summary of our sample composition.

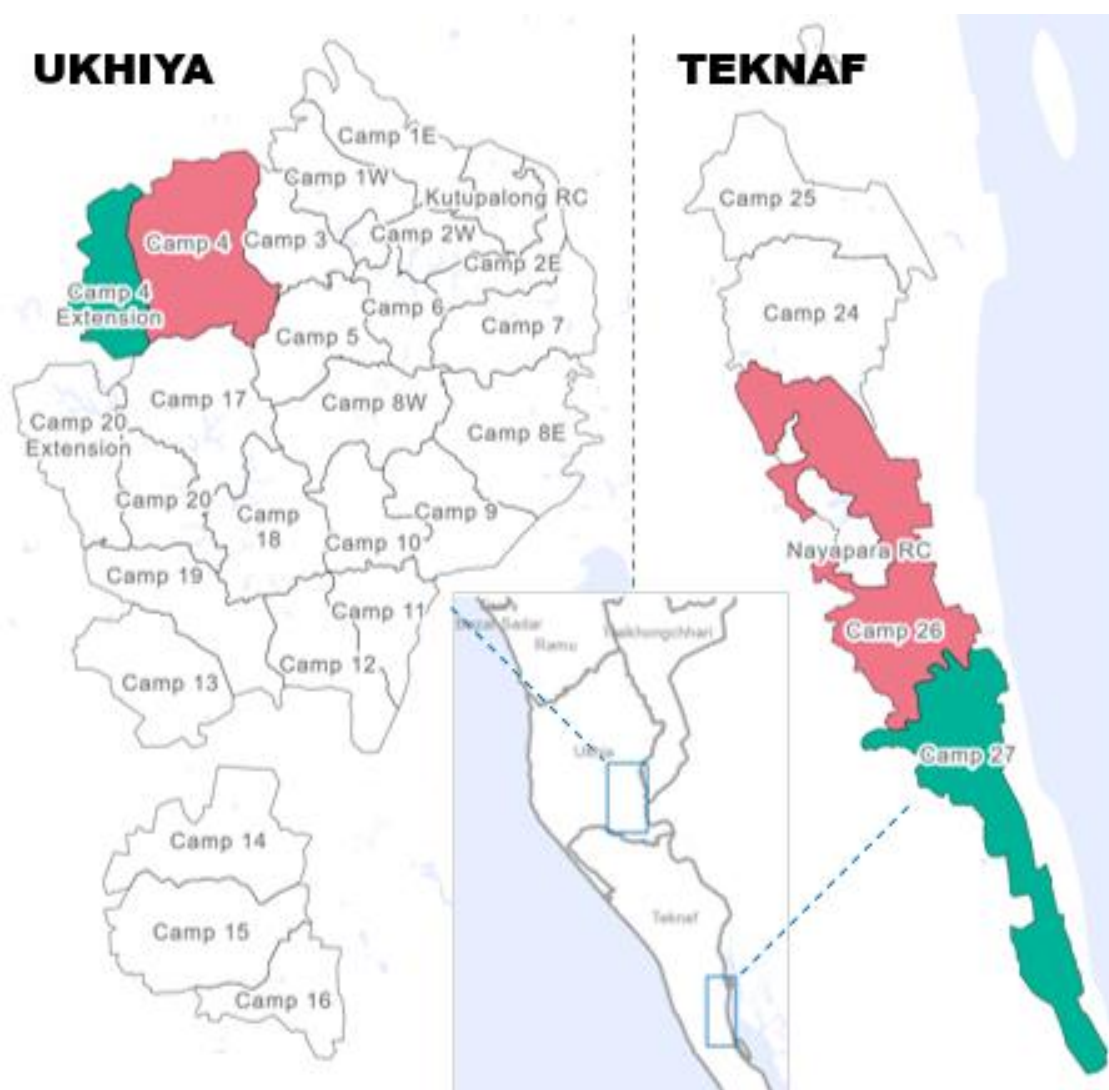
Table 3: Sample Size

Camp Name	Location	Pilot-Study	Number of HHs
Camp 4	Ukhiya	Control	272
Camp 26	Teknaf	Control	269
Camp 4X	Ukhiya	Treatment	254
Camp 27	Teknaf	Treatment	275
Total	-	-	1070

2.3 Map of Survey Locations

Map 1 shows location of the camps where the survey was conducted.

Map 1: Location of Camps in the Study



Source: IUCN Pressure Cooker Pilot Survey, 2023

3.0 Descriptive Statistics: Survey Findings

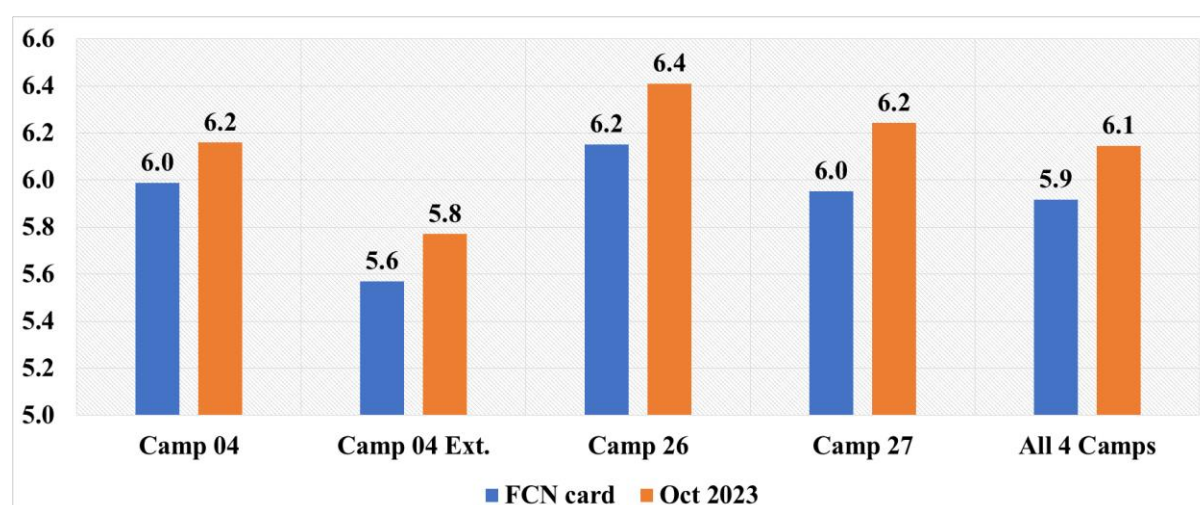
This section highlights the results of descriptive analysis based on the survey findings:

3.1 Changes in family sizes

In the refugee camps, each family is assigned a Family Counting Number (FCN), containing details about the number of family members in accordance with the UNHCR records. While there exists a procedure to update this information to reflect changes such as births, deaths, marriages, and separations, this process is not instantaneous. Nonetheless, it is crucial to acknowledge that the majority of households in refugee camps receive their allocated quotas of food, fuel, and other supplies based on this recorded information. Figure 1 illustrates the variations observed between the FCN records and the actual family sizes, shedding light on the deviations that may exist in the latest official documentation compared to the current household compositions. The difference is due to the fact that a) UNHCR registration is based on nuclear families, while married children may decide to eat together with their

parents (in that case they receive two cyclinders); b) sometimes there are delays in obtaining CiC approvals for updating registration

Figure 1: Difference in HH Size between FCN Card and October 2023 Survey



Source: IUCN Pressure Cooker Post Pilot Survey, 2023

3.2 Refugee Families and income

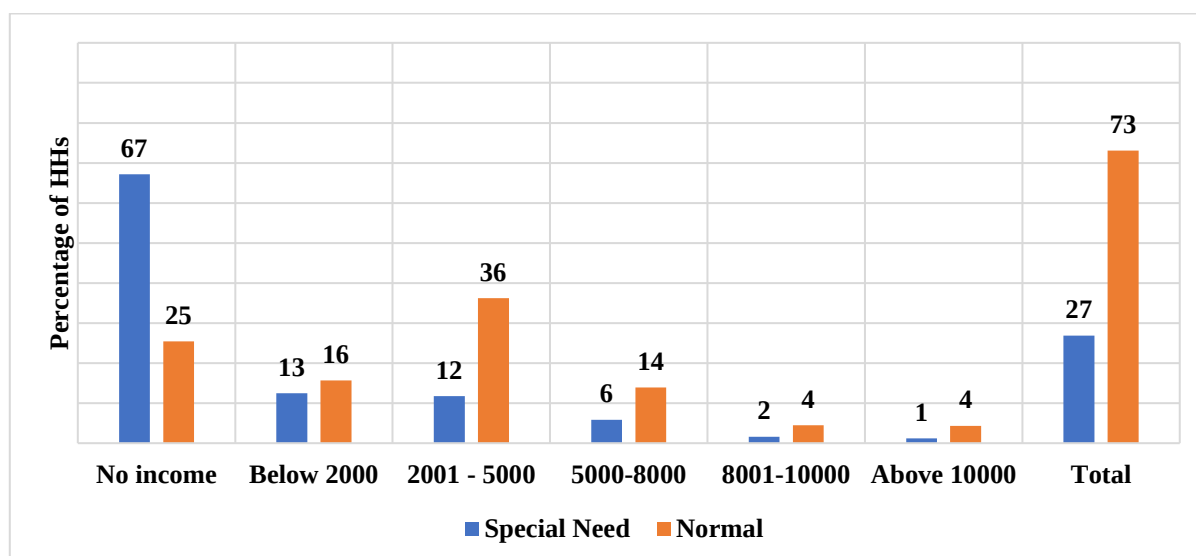
Refugee families, by and large, are comprised of individuals who have endured the hardships of war, discrimination, and various injustices in their home country. Consequently, a significant proportion of these families fall into special category of persons with specific needs (PSN). UNHCR has established a family classification system, tailoring assistance to the specific needs of these distinct groups. According to the survey findings, approximately 27% of the households surveyed fall within these special categories, highlighting the prevalence of families in unique circumstances that may require specialized support and attention.

Within the category of special needs households, a notable two-thirds find themselves without any income, underscoring the financial challenges prevalent in this group. In contrast, among non-PSN refugee families (no member needs special attention), a comparatively smaller one-fourth reports having no income.

Examining the income distribution further, 13% of PSN and 16% of non-PSN have average monthly cash income of less than 2,000 taka¹. Within the income bracket of 2,000-5,000 taka, approximately 36% are non-PSN refugee families while only 12% of PSN families. Similarly, within the 5000-8000 income range there are 14% non-PSN families whereas only 6% of PSN families are in this group. Finally, in the income group of 8000+, there are 8% families who are non-PSN and only 3% are PSN families. This implies that income distribution of PSN families is left-skewed where large majority have less income than non-PSN refugee families.

¹ In addition to cash income, families do have in-kind income in terms of food, fuel, and hygiene ration from UNHCR. There are, however, some families who are engaged in paid work with local businesses inside the camps or income from different kinds of paid job available within the camps.

Figure 2: Percentage of HHs by Income Groups by Non PSN and PSN refugee Families



Source: IUCN Pressure Cooker Post Pilot Survey, 2023

3.3 Income Group and Food Consumption

The Food Consumption Score (FCS) serves as a metric utilized by the World Food Programme (WFP) and other organizations for evaluating the quality and diversity of household diets. It assigns a numerical value based on the frequency and variety of food groups consumed by a household within a specified timeframe, typically the preceding seven days. This score plays a crucial role in measuring the food security status of communities, pinpointing vulnerable populations, and formulating targeted interventions to enhance nutrition and overall food security.

Based on the FCS value, households are categorized into three groups. Those with a food consumption score between 0-21 are classified as having poor dietary income. Additionally, households with a food consumption score between 21 and 35 are considered to have a dietary variety in the borderline range, while households with a food consumption score above 35 falls into the category of acceptable dietary variety. According to survey data, 4.7% of refugee households in selected camps exhibit poor dietary and nutritional intake, whereas 38.9% fall into the borderline category, and 56.4% are within the acceptable range. Table 4 underscores that an increase in household income contributes to improved dietary variety and nutritional intake for these refugee households.

Table 4: Percentage of HHs by Income Groups and by their Food Consumption Status

Income Group	% of HHs		
	Poor	Borderline	Acceptable
No income	8.3	47.0	44.7
Below 2000	4.3	43.3	52.5
2001 - 5000	2.1	37.2	60.6
5000-8000	2.7	25.9	71.4
8001-10000	2.9	17.1	80.0
Above 10000	0.0	15.2	84.9
Total	4.7	38.9	56.4

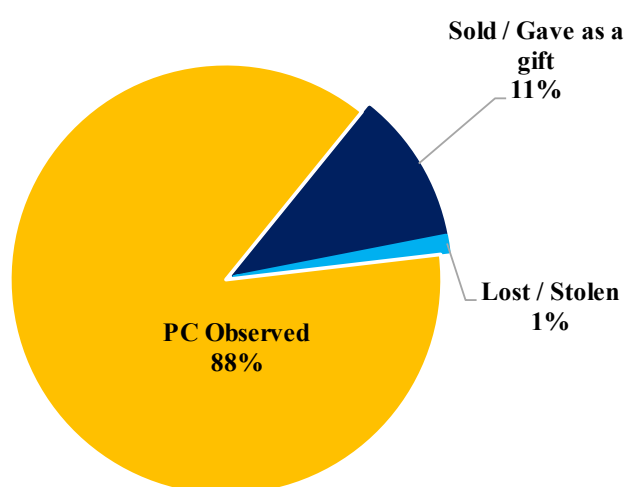
Source: IUCN Pressure Cooker Post Pilot Survey, 2023

3.4 Status of Pressure Cooker at Household level

Even though each family received one pressure cooker, the anticipated outcome of reduction in demand for LPG depends ultimately hinges on its actual utilization during cooking. However, a significant portion of refugee families lacks a concrete income source, raising the possibility that some may have resorted to selling the pressure cooker in the market to obtain cash for addressing urgent family needs.

As an integral part of the study, comprehensive data was collected to assess the current status of the distributed pressure cookers. Figure 3 indicates that a significant portion, nearly 88%, retained the pressure cooker in their possession, while 12% did not. Further analysis reveals that approximately 11% of households either sold the pressure cooker or chose to 'gift' it to relatives, while a minimal 1% reported that it was lost or stolen. These findings provide valuable insights into the effective implementation and retention of the distributed pressure cookers among the target households.

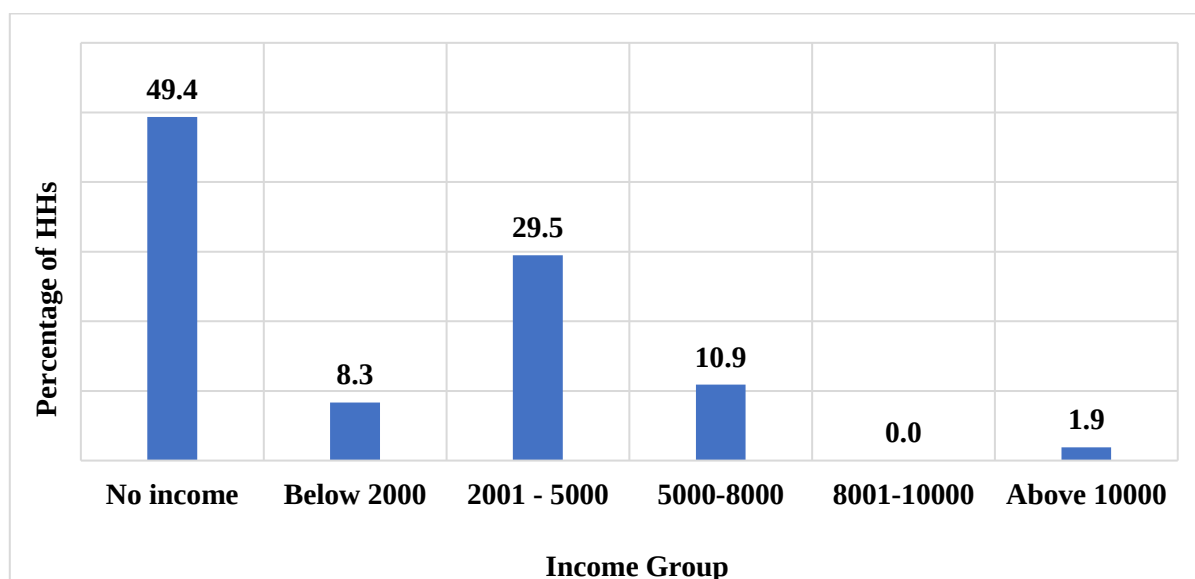
Figure 3: Status of Pressure Cooker by Percentage of HHs



Source: IUCN Pressure Cooker Post Pilot Survey, 2023

Almost half, or 49%, of refugee households without a pressure cooker reported having 'no income,' (see Figure 4) highlighting a significant trend of pressure cooker sales among financially strained households. Supplementary information gathered during on-site field visits further revealed that many of these families resorted to selling their pressure cookers to meet urgent cash needs, particularly for medical treatment.

Figure 4: Pressure Cooker Missing by Income Group



Source: IUCN Pressure Cooker Post Pilot Survey, 2023

3.5 Awareness Campaigns

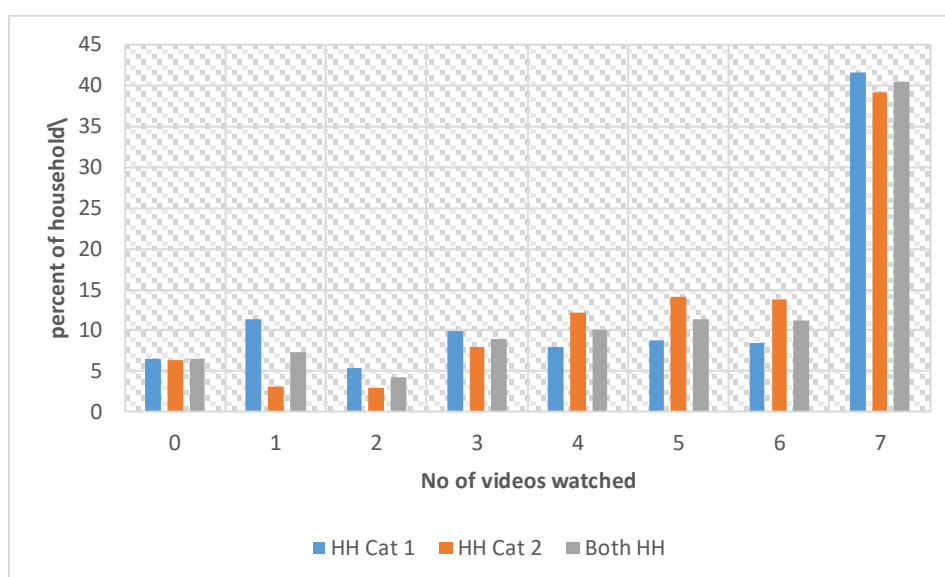
Cooking with a pressure cooker presents challenges, as it necessitates adjustments in cooking times and the practice of cooking without opening lids. The use of whistles as indicators adds complexity and serves as a major barrier for individuals. Recognizing this, various initiatives were introduced to educate and encourage the use of pressure cookers.

To address the learning curve, non-stop instructional videos were broadcasted at distribution centres, guiding individuals on cooking essentials such as rice, lentils, potatoes, and meat dishes using pressure cookers. These videos also covered instructions on boiling water and proper post-cooking cleaning procedures. Survey data reveals that over 70% of refugee households actively engaged with these instructional videos, indicating a significant uptake in efforts to educate and motivate them to embrace the use of pressure cookers.

The survey categorized households into two groups. Household Category 1 (HH Cat 1) comprises households that recently received pressure cookers and were part of the control group during the pilot phase study. They received the pressure cooker now and are subjected to a new campaign to promote its use. On the other hand, Household Category 2 (HH Cat 2) are the households that received pressure cookers in the pilot phase and are also targeted by the new campaign (because they had low adoption rate of PC use between households of size 2-6). They will also have gained access to the new campaign videos and the block-level campaign. This is because households living in these camps who did not receive pressure cooker in the pilot phase, received the pressure cooker now along with a block-level campaign to promote its use. Consequently, household category 2 is also subjected to the same campaign and within the provision of revised refill cycle.

Figure 5 indicates that the first category of households, specifically those who received pressure cooker for the first time and are targeted by a new campaign (Household Category 1), exhibited a higher viewing rate of campaign videos compared to the Household Category 2. This suggests that the campaign was effective and reached the intended audience, resulting in a higher possibility of uptake in using pressure cooker.

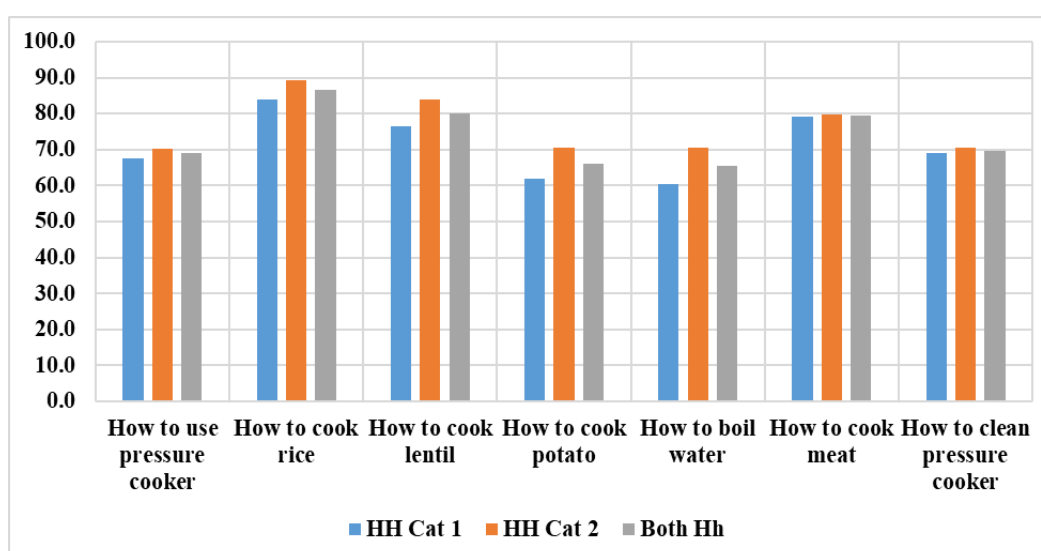
Figure 5: No of videos watched by different households



Source: IUCN Pressure Cooker Post Pilot Survey, 2023 NOTE: HH Cat 1 means households who received pressure cooker recently and were part of the control household group in pilot phase), HH Cat 2 means households who received the pressure cooker in March – during the pilot phase.

Figure 6 illustrates a notable increase in viewership attributed to the current campaigns, surpassing the levels observed during the pilot phase. This indicates that households receiving pressure cookers in this phase have engaged with the instructional videos at a higher rate compared to the pilot phase. Such a trend signifies the effectiveness of the new campaign in successfully reaching and resonating with the target audience.

Figure 6: Reach of campaign video streaming

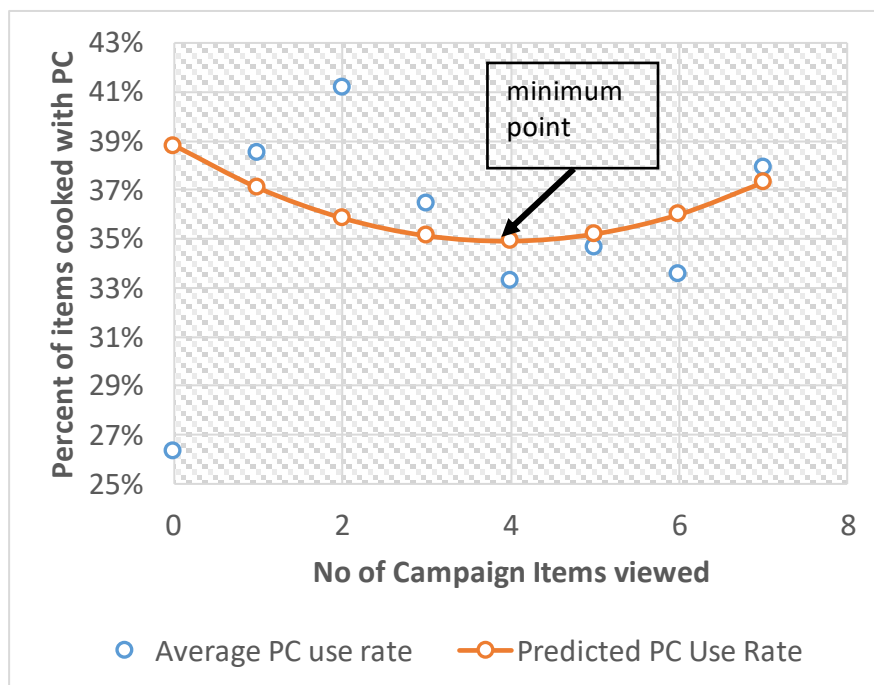


Source: IUCN Pressure Cooker Post Pilot Survey, 2023 NOTE: HH Cat 1 means households who received pressure cooker recently and were part of the control household group in pilot phase), HH Cat 2 means households who received the pressure cooker in March – during the pilot phase.

Figure 7 examines the correlation between the viewing of promotional materials and the percentage of daily items cooked using a pressure cooker. A trend analysis is superimposed, showing that, on average,

households tend to increase their pressure cooker use after the 4th viewing—a transition point from a sceptical user to an experienced user of pressure cookers. This relationship is statistically valid. This suggests that repeated exposure to campaigns is important to promote the use of pressure cookers for cooking food.

Figure 7: Viewing of Campaign Items vs Pressure Cooker Use Rate by Households



NOTE: Regression based prediction.

3.6 Uptake of the Pressure Cooker Use

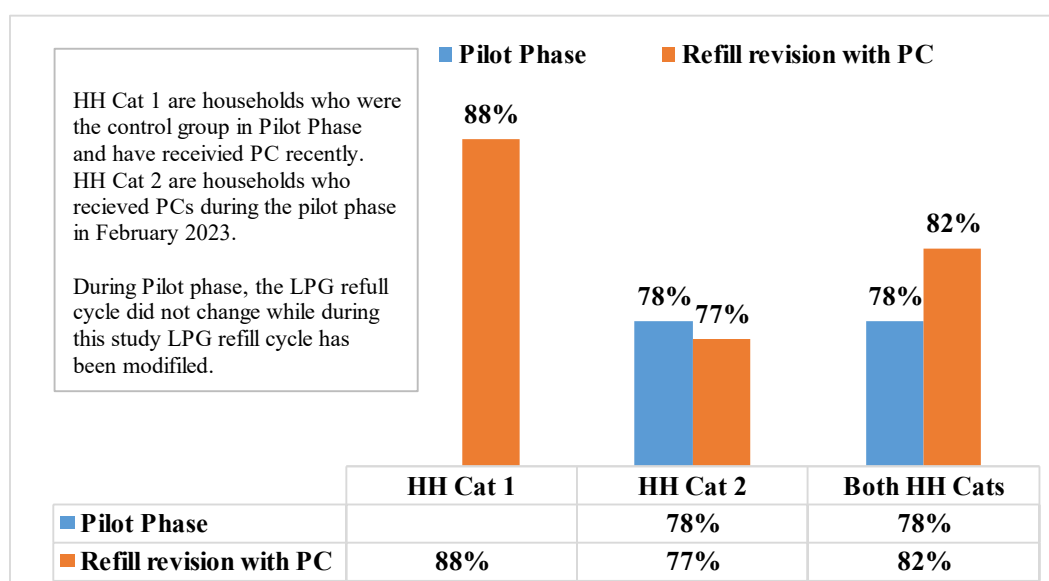
The survey is categorized into two groups. HH Cat 1 comprises 541 households (the control group during the pilot phase) from camp 4 and 26, which recently received a pressure cooker. HH Cat 2 consists of 529 households (the treatment group during the pilot phase) who received a pressure cooker in February 2023 during the pilot phase study.

According to the study, Figure 1 reveals that during the 14-day monitoring period between October 15 and 30, 2023, 88% of HH Cat 1 used the pressure cooker at least once, while it was 77% for HH Cat 2. This observation suggests that the adoption rate of pressure cookers is higher among HH Cat 1 compared to HH Cat 2.

Figure 8 provides a comparative analysis of pressure cooker usage by refugee households during the previous study (Pilot phase) and the current study. The data distinctly indicates a substantial increase in the use of pressure cookers during the current study, coinciding with the implementation of a change in the refill cycle.

During the pilot phase, only 78% of households that received pressure cookers utilized them at least once within the two weeks of the monitoring period. In contrast, the current study, with its new campaigns, reflects an increased adoption rate, with 88% of households utilizing pressure cookers during the same monitoring period. This contrast highlights the positive impact of the new campaigns and the modified refill cycle on encouraging the use of pressure cookers among the refugee households.

Figure 8: User of Pressure Cooker (within treatment group)



Source: IUCN Pressure Cooker Post Pilot Survey, 2023 NOTE: HH Cat 1 means households who received pressure cooker recently and were part of the control household group in pilot phase), HH Cat 2 means households who received the pressure cooker in March – during the pilot phase.

There has been a minor decline in the utilization of pressure cookers among households that received them in March (2023). This finding is statistically insignificant. On the contrary, it was anticipated that the uptake rate would have increased by October (2023), as these households had ample time to adapt. One potential explanation for this discrepancy is the concern that households might have misled enumerators due to the anticipated change in the LPG refill cycle post-survey. Several enumerators noted that these households displayed reluctance to share information, expressing dissatisfaction after the LPG refill cycle adjustment following the March survey.

3.6.1 Pressure Cooker usage pattern during 14-days monitoring period

Each family in the sample was monitored for 14 days to understand their habit of using pressure cooker for preparing different types of meals. There are several ways we can highlight the use of pressure cooker in a household: a) percent of families used pressure cooker at least once during the 14-day monitoring period; and b) percent of times a key item (rice) is cooked using pressure cooker.

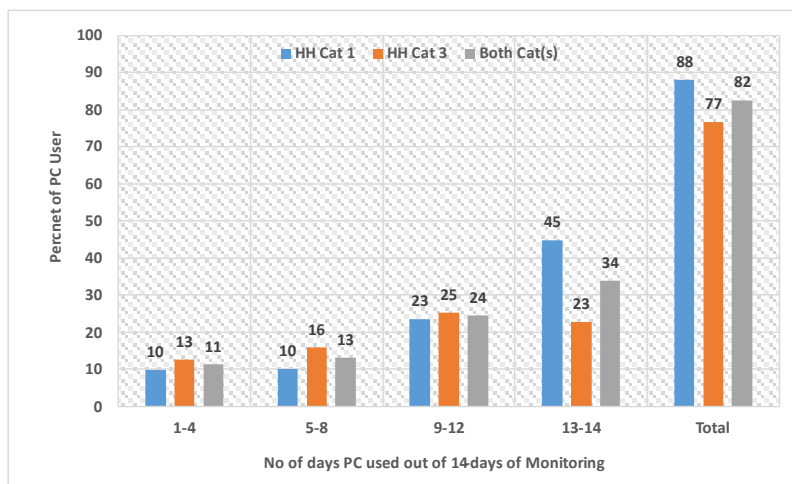
First, Figure 8 and Figure 9 provide valuable insights into the usage patterns of pressure cookers within households, particularly those falling under category 2. In the March 2023 survey, these households exhibited a noteworthy pressure cooker use rate of 78%, as depicted in Figure 8. However, upon revisiting the data in the October 2023 survey, Figure 9 reveals a marginal decrease in the usage rate to 77%.

What's particularly intriguing is that this change occurred over a span of 7 months since the distribution of pressure cookers to these households. Despite this relatively extended period, there appears to be minimal fluctuation in the pressure cooker use rate. As noted above, the lack of behaviour change could be attributed to the fact that after the March research, UNHCR adjusted the LPG refill cycle, bringing the perception to this group (who received pressure cooker in February 2023) that using more pressure cooker will result in more LPG adjustment.

Figure 9 provides a detailed breakdown of the pressure cooker usage patterns during the 14-day monitoring period in this study. Among the users, 34.0% of households consistently utilized the pressure cooker throughout the entire 13-14-day period. Notably, this percentage is significantly higher

among HH Cat 1 (45%) compared to households of Category 2 (23%), indicating a more pronounced adoption rate among households that received the pressure cooker after the pilot phase. This means that families who received pressure cooker recently and were exposed to special awareness campaigns are using it at a rate twice than that of the households who received it in February 2023 or before.

Figure 9: Use of Pressure Cooker by Number of Days at HH level



Source: IUCN Pressure Cooker Post Pilot Survey, 2023. NOTE: HH Cat 1 means households who received pressure cooker recently and were part of the control household group in pilot phase), HH Cat 2 means households who received the pressure cooker in March – during the pilot phase.

Further analysis of the data reveals that 24% of households used the pressure cooker for a duration of 9-12 days, with no significant variation in usage between Category 1 and Category 2. Additionally, 13% of households used the pressure cooker for 5-8 days, while 11% used it for 1-4 days. Despite an overall improvement in the pressure cooker uptake rate between the two survey rounds conducted from March to October 2023, there remains room for improvement, especially among the 24% of households that continue to use the pressure cooker for less than 9 days in a 14-day monitoring period.

3.6.2 Per day use of LPG

Over the 14-day monitoring period, the research team successfully gathered comprehensive data from 1065 households, resulting in a total of 20,355 observations regarding their food intake and LPG usage behaviour. The team consistently recorded the weight of the gas cylinders during each visit to the families. The following table provides a descriptive summary of the data related to LPG usage.

Table 5: Summary of 14-day Monitoring Data by Household Size

Household size	Daily LPG consumption in KG	Average Number of Guests per day	Percent of time rice cooked using pressure cooker (PC)	Monthly average income in Taka	Number of times rice is cooked in a day
1	0.260	1.12	31.3	325.12	2.29
2	0.246	0.66	35.7	910.62	2.24
3	0.267	0.45	33.9	1948.26	2.27
4	0.275	0.49	39.0	2585.20	2.38
5	0.290	0.55	40.8	3172.17	2.42
6	0.321	0.50	41.3	3277.70	2.37
7	0.340	0.38	42.6	2756.95	2.46

8	0.370	0.40	39.4	3332.17	2.51
9	0.401	0.42	40.6	2870.68	2.49
10	0.436	0.55	37.0	3552.45	2.67
11	0.453	0.47	38.4	4504.34	2.73
12	0.491	0.56	29.4	3354.53	2.63
13	0.516	0.23	42.5	3460.63	2.72
14	0.565	0.34	7.1	3811.32	2.66

Source: IUCN Pressure Cooker Post Pilot Survey, 2023

Table 5 highlights a significant fluctuation in daily LPG (liquefied petroleum gas) consumption, primarily influenced by household size. The average daily consumption (of LPG) varies, ranging from 246g for a family of two to 565g for a larger family of 14. Notably, excluding one-member households, LPG consumption consistently increases with the expansion of family size.

Table 5 further shows that one-member families had on average 1.12 guests per day, suggesting a continual presence of someone sharing meals with the single member. These guests often include individuals visiting single-member families, who either share kitchen spaces or actively contribute to cooking or relatives visiting them on social calls. Consequently, this leads to a slightly higher overall daily LPG consumption in one-member households. For families with more members, the guest size fluctuates from 0.23 to 0.66, indicating the presence of a guest in almost every 2-4 days. This observation underscores the prevailing culture of hospitality within Rohingya families. The data reflects not only the impact of family size on LPG consumption but also the cultural aspects of hospitality and communal cooking practices within the Rohingya community.

3.7 Number of items cooked with pressure cooker

The examination of pressure cooker utilization within refugee households goes beyond merely tracking adoption rates. The study investigates into the quantitative aspect by exploring the number of items prepared with pressure cookers in comparison to alternative cooking methods. This analytical approach is visually represented in Figure 10, where the pressure cooker usage rate (%) reflects the percentage of items cooked in pressure cookers out of the total items prepared by the households in a day.

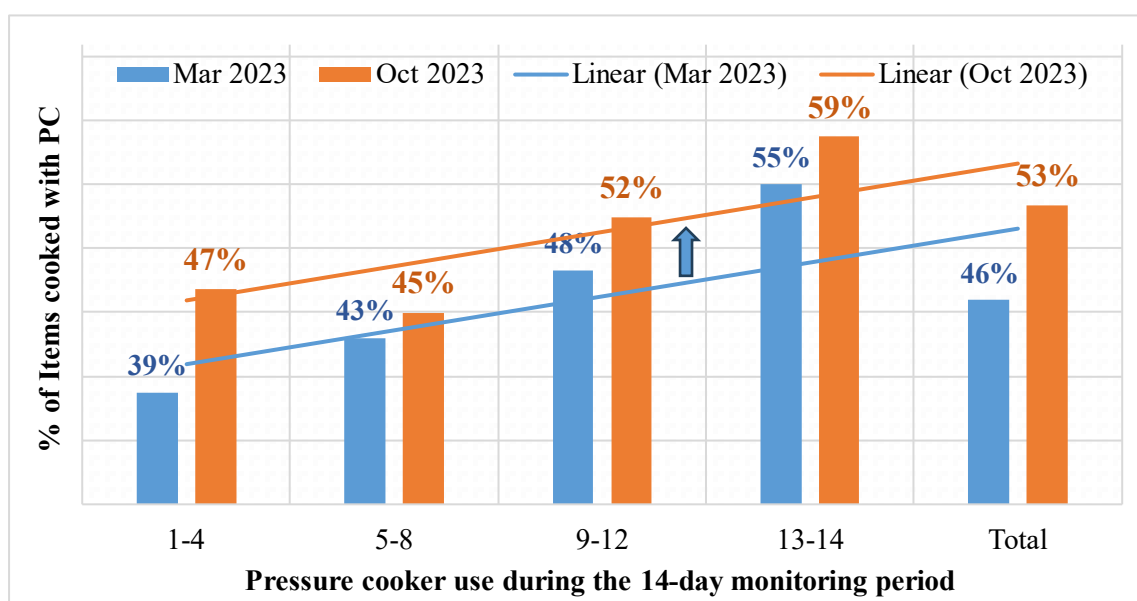
To elucidate, imagine a scenario where a refugee household cooks rice twice daily but employs a pressure cooker only once. In this instance, the pressure cooker usage rate would be 50%. This metric provides a comprehensive understanding of the frequency with which pressure cookers are employed in the preparation of various meals within a household.

The study's findings bring forth a significant revelation: presently, around 53% of all items cooked in refugee households are prepared using pressure cookers, as opposed to 46% in March 2023. The difference is statistically significant. This means, that with changes in refill cycle and with newly implemented strategies of campaign, the pressure cooker use rate has increased. However, it is still used for cooking 1 in 2 items cooked daily.

Moreover, the data reveals a compelling correlation: households that utilized a pressure cooker for more days during the 14-day monitoring period exhibited a higher usage rate. This indicates a gradual increase in pressure cooker use rate as they gain more experience—an observation that reflects a growing sense of familiarity and ease of using pressure cooker among individuals. Figure 10 also illustrates that the use rate in the October survey surpasses that of the March survey, suggesting an improvement in pressure cooker use rate coinciding with the introduction of the pressure cooker, a new refill cycle, and an associated campaign (the trendline has shifted up in October survey compared with the March survey).

In essence, this data not only underscores the widespread adoption of pressure cookers but also highlights their versatility in culinary preparations. The acknowledgment that nearly half of the food items in refugee households are cooked using pressure cookers suggests that this kitchen tool is not merely a novel addition but can be an integral component of daily cooking routines. This insight establishes a valuable foundation for future interventions, emphasizing the importance of sustained usage and the potential expansion of the repertoire of recipes that can be prepared using pressure cookers (refer to Figure 10).

Figure 10: Pressure Cooker Utilization Rate (%)

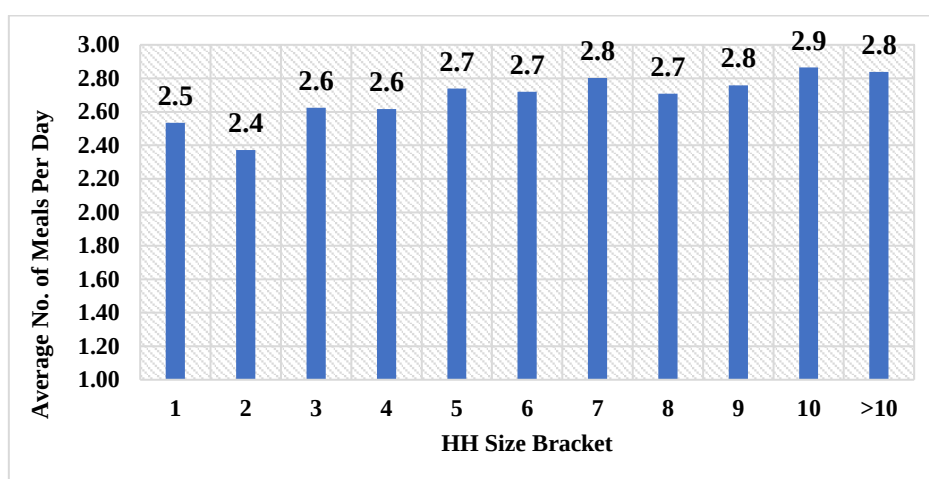


Source: IUCN Pressure Cooker Post Pilot Survey, 2023

3.8 Number of meals cooked per day

The frequency of daily meals prepared has a notable impact on fuel usage efficiency. The research examined cooking habits across various household sizes to assess this influence. The study reveals that smaller households, consisting of 1 to 3 family members, tend to cook meals approximately 2.4 to 2.6 times per day on average. As the family size increases, the frequency of cooking also rises. Larger households, specifically those with more than 10 members, cook more frequently, preparing approximately 2.8 to 2.9 meals per day. (See Figure 11).

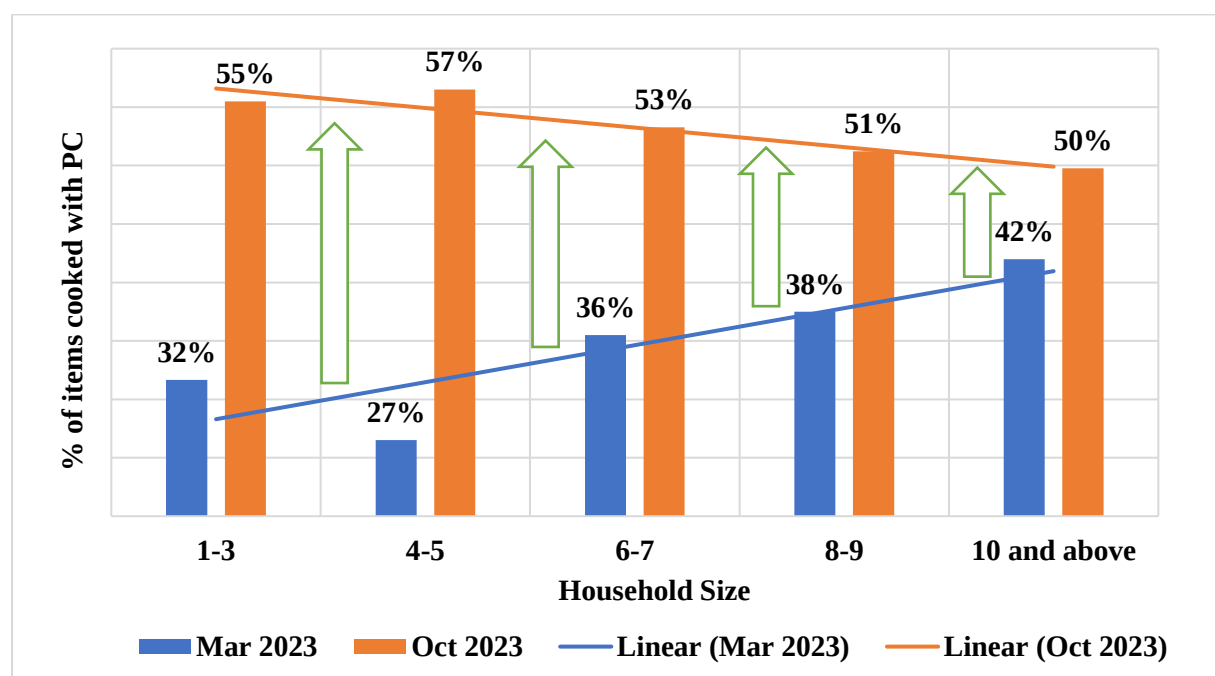
Figure 11: No of Meals cooked per day



Source: IUCN Pressure Cooker Post Pilot Survey, 2023

Regarding the utilization of pressure cookers for meal preparation, Figure 12 indicates an overall increase in the pressure cooker use rate across households of various sizes. Notably, the rise is more pronounced among smaller households compared to larger ones. The significant increase in smaller households is attributed to the fact that they initially had a much lower use rate than larger households in the March 2023 survey. This shift signifies a notable success of the campaign operation during this round, as it has effectively led to an increased adoption of pressure cookers, particularly among smaller families.

Figure 12: Pressure Cooker Utilization Rate (%) by Household Size



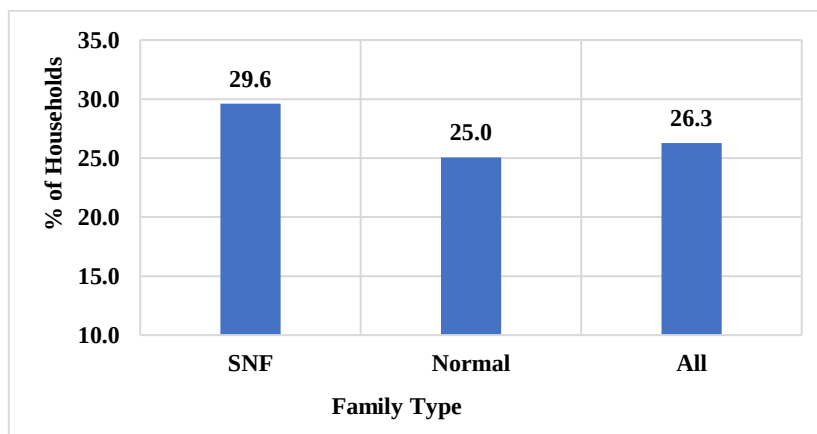
Source: IUCN Pressure Cooker Post Pilot Survey, 2023

3.9 Water Boiling Habit

Figure 13 illustrates the percentage of households that used pressure cookers to boil water, categorized by types of households non-PSN (non-Persons with Special Needs) and PSN (Persons with Special Needs) refugees. In the surveyed households, nearly 26.3% used pressure cookers for boiling water.

The use of pressure cookers for boiling water is found to be slightly higher among special needs families (29.6%) than among non-PSN families (25.0%). Historically, the average minimum temperature in March is around 17.9°C, while in October it is nearly 23.4°C (2001-2020). Hence, no changes in the habit of boiling water are expected.

Figure 13: Water Boiling



Source: IUCN Pressure Cooker Post Pilot Survey, 2023 Note: SNF means Special Need Family (PSN).

3.10 Fuel Choices for Cooking

While cooking food, there is always a need to use different types of cooking ware and stoves. Therefore, it is likely that families might occasionally use non-LPG stoves for preparing certain meals. Moreover, since each household has only one LPG stove, they may also possess a second stove for use to save cooking time.

During our field visits, we noticed that families with specific needs, such as those with one elderly member or families with no adult members, face particular difficulties. Many of them rely on other families to cook their food or supply them with food, and these caregivers take care of their cooking needs. We observed one special needs family living with a local host family who shared their LPG cylinder in exchange for them preparing food. This illustrates the challenges that special needs families encounter in terms of cooking and transporting LPG cylinders. Fortunately, the current LPG cylinders have a lower tare weight than previous ones.

Table 6: Source of Fuel for Cooking

	No of alternative fuels used			Total
	0	1	2	
No LPG user	53 ²	0	1	54
LPG users	753	169	55	977
Total	806	169	56	1031

Source: IUCN Pressure Cooker Post Pilot Survey, 2023. Note: n = 1031

In Table 6, the survey of 1031 families reveal that most of them, precisely 977 families (94.76%), are users of LPG, whereas approximately 54 families (5.24%) do not utilize LPG. Among the non-LPG users, 53 families rely on other households to cook for them, signifying a dependence on communal

² UNHCR later completed a tracer study on 43 of these households and noted that 39 of these households were able to show presence of LPG cylinders. Furthermore, 11 of them (25.5%) were PSN families (person with special needs).

cooking arrangements. Interestingly, only one family reported using two different types of fuel for cooking.

Within the LPG user category, nearly 77% (753 families) exclusively rely on LPG for cooking, while 169 families (17.2%) use a secondary fuel in addition to LPG. The remaining 57 households utilize two additional types of fuel for their cooking needs. The detailed distribution of fuel sources among the 978 households is presented in Table 7. Notably, 10.43% of households still use firewood for cooking, and 18% utilize twigs, leaves, etc. Upon closer examination during our field survey, it was observed that many households predominantly use dry bamboo as a fuel source for cooking. In total nearly 29% households use more than one fuel for cooking reflecting the diverse need for fuel to cook different food items.

Table 7: Various Fuel Sources for Cooking

Fuel Sources	% of families	No of families
Liquefied Petroleum Gas (LPG)	99.9	977
Compressed Rice Husk (CRH)	0.31	3
Firewood	10.43	102
Twigs, leaves etc.	18	176
Others, specify	0.72	7

Source: October 2023 Survey. Note: n = 978 * Sum of families is 1265 due to multiple responses.

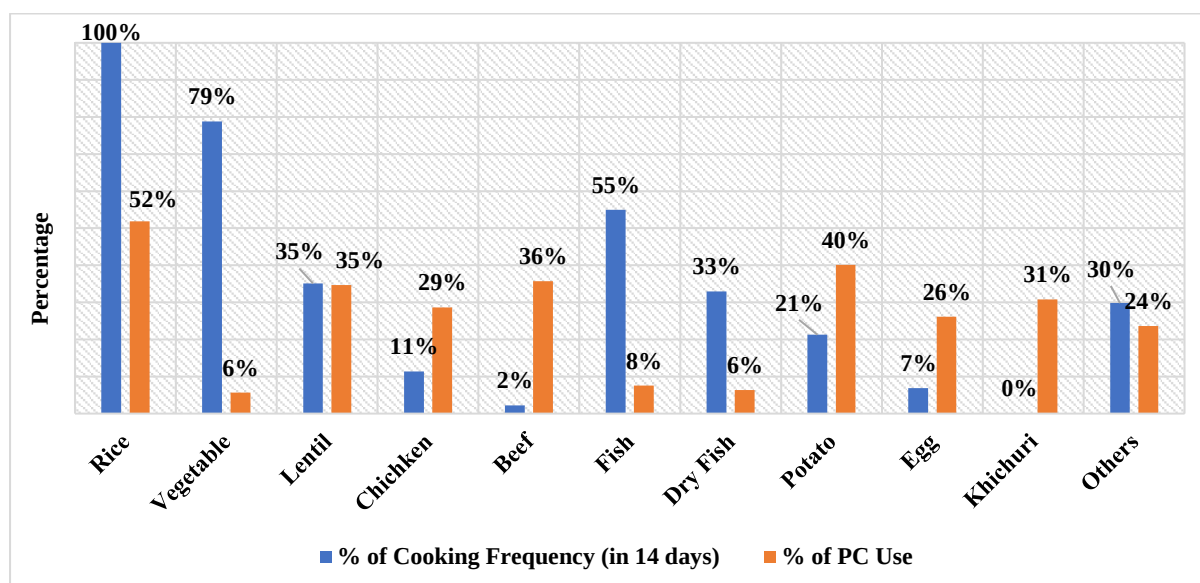
3.11 Food Habit of Refugee Households

The utilization of pressure cookers is significantly influenced by the types of food items being cooked, as not all items can be efficiently prepared using this cooking method. In order to gain insights into the dietary habits of refugee households, the survey incorporated questions regarding the food items prepared the day before. The responses provided a comprehensive picture, indicating that all households included in the survey cooked rice. Furthermore, 79% of households prepared vegetables, 55% cooked fish, and 35% cooked lentils. In addition to these staples, 33% of households mentioned cooking dry fish, 21% prepared potato dishes, and 11% cooked chicken meat. A smaller percentage, 2%, mentioned cooking beef.

What's notable is that this diversity in food items remained consistent across both household categories 1 and 2, as depicted in Figure 14. This underscores the similarity in dietary practices within the refugee community. As such, differences in their uptake of pressure cooker use, or in their fuel choice should not be different under an ideal situation.

Among these food items, the top three food items prepared using a pressure cooker include rice, lentils, and potato dishes. Approximately 52% of the time, rice is cooked using a pressure cooker, while lentils are prepared using pressure cooker about 35% of the time. Similarly, potato dishes are cooked using a pressure cooker in approximately 40% of instances.

Figure 14: Food Habit and Items of Food



Source: IUCN Pressure Cooker Pilot Survey, 2023

3.12 Uptake of PC use for cooking rice, lentil, and potato

Figure 14 shows that how the families are using pressure cooker and daily frequency of cooking the selected items in the camps. Except for rice none of the items are cooked daily. 79% of households cook vegetables in a day, while 35% cook lentils in a day. This is 21% for potato, 55% for fish and for most other items it is 10% or below. On the other hand, pressure cooker use rate is much higher for rice, lentil, chicken, beef, potato, eggs and for cooking khichuri (*Khichuri* in Bangla).

In the pilot study report, a noteworthy observation highlighted that the adoption of pressure cookers for cooking rice, potato, and lentils was relatively low among family sizes ranging from 3 to 5 members. Recognizing the potential for maximizing benefits in terms of saving LPG, it was recommended to conduct a targeted campaign during the distribution to these specific household groups.

In response to this recommendation, during the final phase of pressure cooker distribution, UNHCR implemented a comprehensive awareness campaign. This campaign included as mentioned before a) video presentations at distribution centres and b) block-based initiatives aimed at promoting the effective use of pressure cookers.

The current survey indicates a significant increase in the utilization of pressure cookers among families with sizes ranging from 2 to 8. This positive trend is visually depicted in the following figures.

Figure 15: Current Use of PC for Cooking Rice by HH Bracket

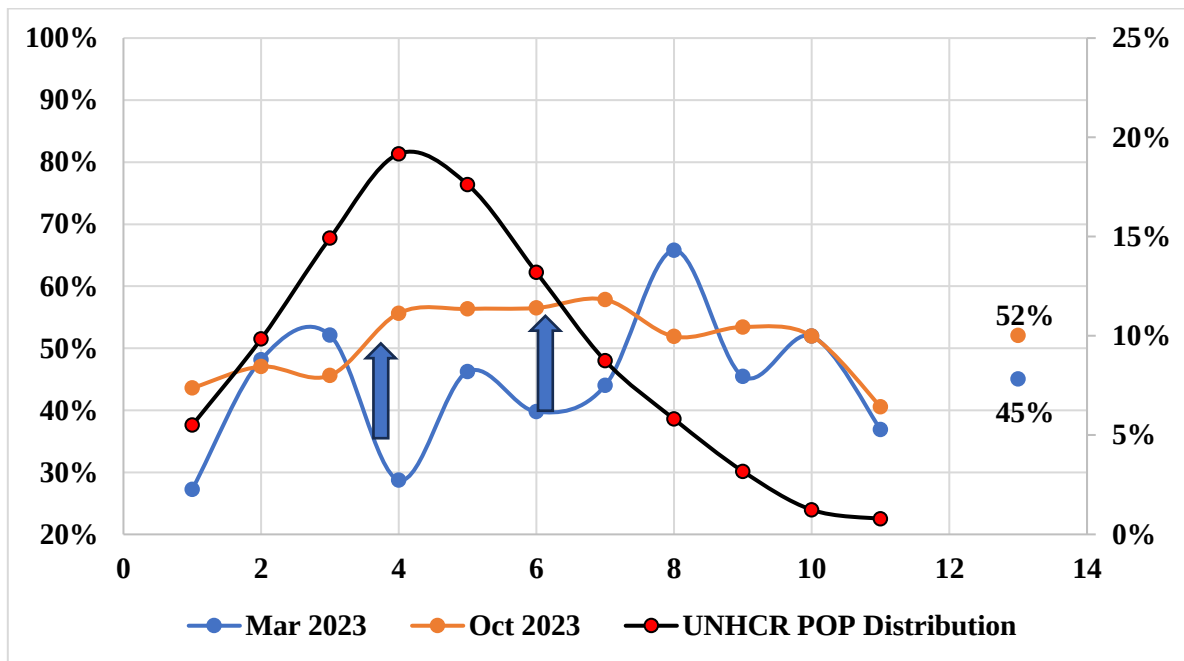


Figure 16: Current Use of PC for Cooking Lentil

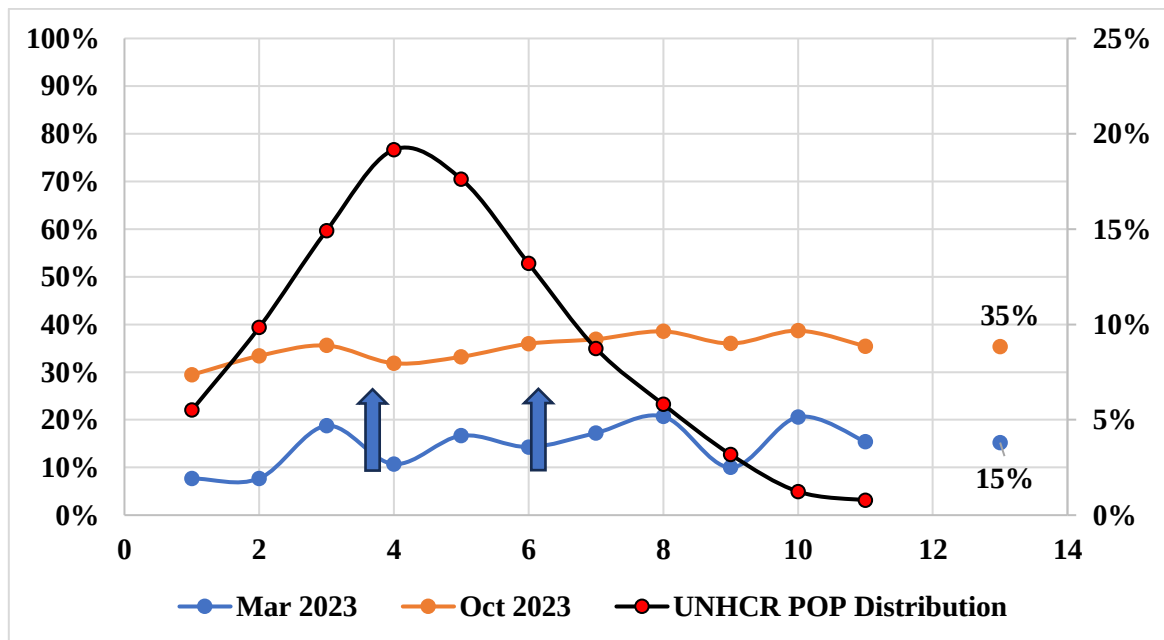
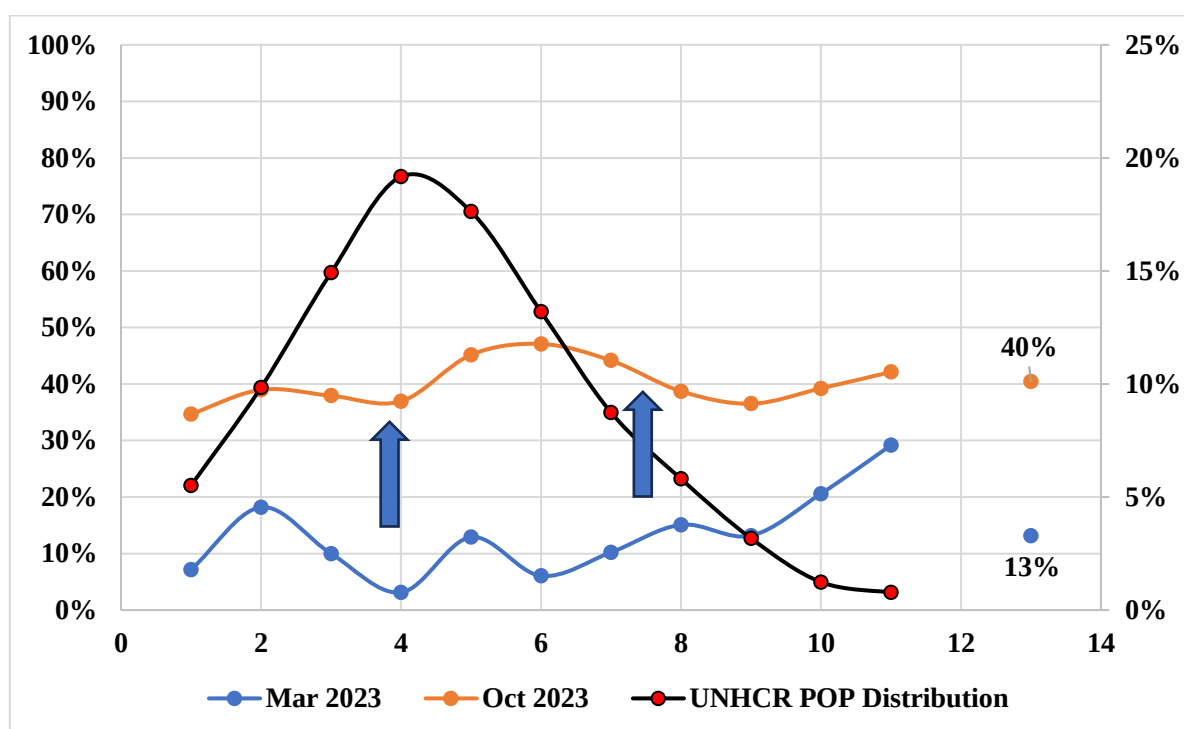


Figure 17: Current Use of PC for Cooking Potato Dishes



Source: IUCN Pressure Cooker Pilot Surveys, 2023

This represents a remarkable success story, as the notable surge in the adoption of pressure cookers among families in the camps is poised to yield substantial benefits, particularly in terms of LPG savings. The increased uptake is anticipated to have a cascading effect on the overall consumption patterns, resulting in a significant rise in the conservation of LPG within the camp community.

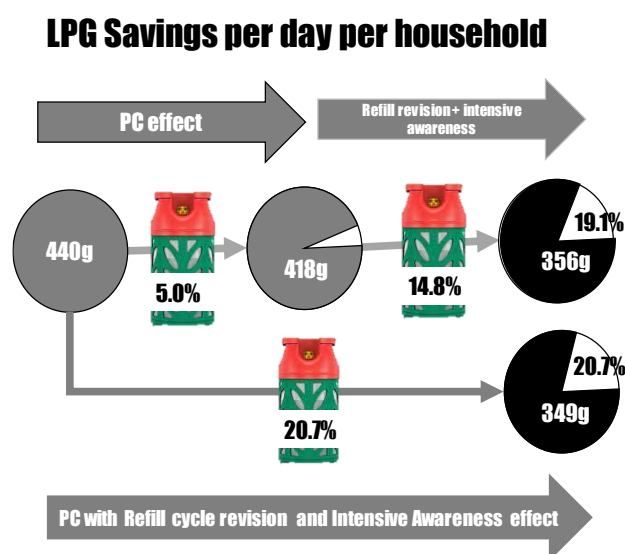
With this heightened acceptance of pressure cookers, there is an optimistic outlook for even greater gains in LPG savings than initially projected in our prior studies. As the new refill cycles commence, the impact of this positive trend is expected to surpass earlier estimations, reflecting a promising shift towards more sustainable and efficient cooking practices within the camp environment.

4.0 Impact of Pressure Cooker Use and Savings of LPG

Figure 18 illustrates the influence of utilizing a pressure cooker on daily LPG savings in a household. The analysis differentiates between the effects of the pressure cooker itself and the alteration in the refill cycle for LPG distribution. On average, a refugee household previously consumed 440 grams of LPG per day, and with the integration of a pressure cooker, this amount decreased to 418 grams per day, reflecting a 5% reduction. Notably, this reduction is statistically significant.

However, when the use of PC is incentivised by refill cycle change from a prior study, the impact becomes substantial. Households were able to lower their daily LPG consumption from 440 grams to 356 grams, resulting in a notable 19% reduction in LPG usage. This signifies an additional reduction of almost 14% in LPG consumption. A comparative analysis of households already using LPG in March 2023 reveals that the refill cycle change alongside intensive awareness campaign led to a nearly 20% reduction in LPG usage (see Figure 18).

Figure 18: Impact of PC use and Savings of LPG



4.1 Impacts of pressure cooker use

There are two different ways we can estimate the impact of introducing pressure cooker on LPG consumption. In the first phase, we measure average impact on LPG savings due to the intervention. This is the gross impact. In the second phase, we measure the net or marginal impact on LPG savings and how it is affected by family size.

4.1.1 Average Impact on LPG use per day

Firstly, let's compare the averages, specifically the average drop in LPG consumption per day by household size. This calculation is presented in the following table. We refer to this as the gross or average impact of PC introduction on LPG savings. However, this does not account for other factors that may have influenced these savings, such as family size, cooking habits, types of items cooked, and so on.

Table 8: Gross Saving of LPG by introducing LPG

Impact due to	LPG savings per day per family
Pressure cooker distributed without refill cycle adjustment (Pilot Phase – PC distributed in March 2023) – T1C as in Table 2.	22.0g
Refill cycle revision with intensified PC use campaign (Pilot Phase household – March 2023 group of household) - T3T1 as in Table 2.	62.0g
Pressure cooker + refill cycle changes + intensified PC use campaign (PC distributed in October 2023) – T2C as in Table 2	91.0g

Undoubtedly, the revision of the refill cycle has been a pronounced and noteworthy incentive on households to use pressure cooker, demonstrating a marked inclination towards LPG savings. This outcome aligns seamlessly with the findings of our prior study, wherein we could only anticipate a modest 6-7% reduction in LPG consumption in the absence of any alterations to the refill cycle.

Therefore, the combined implementation of a pressure cooker and the revised refill cycle among refugee households has proven to be significantly more effective in bringing the behavioural change and achieving substantial savings in LPG usage. This synergy underscores the importance of a comprehensive approach in promoting energy conservation within these communities. Table 8 presents the gross savings of LPG due to introduction of LPG based on the survey data.

4.1.2 Net or Marginal Impact on LPG conservation

To estimate the net or marginal impact of introducing pressure cookers among refugee families, we employed a panel regression model using the difference-in-difference technique. This model not only controls for family size but also for other characteristics of the families, including:

- a) the number of guests eating with them,
- b) cooking habits such as cooking lentils, rice, and potatoes with a pressure cooker,
- c) the total number of times these items are cooked per day, and
- d) the income of the households.

We specified two such regression models (shown in Table 9). These models control for these differences in family characteristics and then estimate the impact of cooking with a pressure cooker on LPG consumption.

This model is described below using the following equation.

$$\text{Average Savings per day} = \text{Constant} + \beta_1 (\text{Household Income}) + \alpha_2 (\# \text{ of rice cooked per day}) + \alpha_3 (\% \text{ of times rice cooked with PC}) + \beta_4 (\# \text{ of guests per day}) + \varepsilon$$

Where the coefficient α_1 measures impact of income on LPG consumption at the household, α_2 measures impact on LPG consumption due to rice in the number of time rice is cooked in house in a day, α_3 measures net impact of using PC for rice cooking; and α_4 measures the impact on LPG consumption due to guests in the house during meals.

The important parameter in this case is the coefficient α_s which is the marginal impact of saving LPG per times a household cook their rice with PC and so on. The β -coefficients measure impacts of other variables on consumption of LPG in the family.

The results, so far, indicate a potential for increased LPG savings if households adopt pressure cookers for cooking rice, lentils, and potatoes. Currently, households are cooking only one out of every two daily items with a pressure cooker on average. However, there are variations among households. To assess the net impact of introducing pressure cookers on LPG consumption, we employed a panel regression, and the results are presented in Table 9.

Table 9 includes two regression models: the first one incorporates all variables, while the second one excludes lentils and potatoes. This exclusion was necessary due to the limited data availability (as only a very few households cooked lentil, rice and potato on a day of monitoring) and so there are only 1,861 observations with rice, lentil, and potato consumption compared to 20,355 observations for rice consumption. Consequently, we utilized model 2 for our analysis which is robust. Coefficients that are not statistically significant (significant coefficients are indicated by *, **, ***) are excluded from the numerical calculation.

To interpret the results, the key parameter is the coefficient of “% of times rice cooked with PC (pressure cooker) - Treatment 1” which is printed in bold fonts. It implies that if the household cooks rice meals using PC, then about 14.7 gm of LPG is saved per cooking. This is statistically significant with 99% confidence level. However, difference in LPG use for using PC for cooking lentil and potato are not

statistically significant. Hence, we have re-estimated the model in the last column without lentil and potato in the model, where the reduction of LPG for cooking rice with LPG is also similar (14.8g per day).

Econometric estimates suggest that maximum advantage of using PC to save LPG is possible through cooking rice with PC and if an average family cooks rice 2 or more times in a day.

Table 9 presents the panel regression result. It shows that by pursuing a strategy to increase use of pressure cooker for cooking rice will save 14g of LPG per day in the family while it will be only 9g per day if they cook another lentil meal and it will be 12g if they do it for cooking potato.

Figure 14 already showed that while 100% of the households cook rice every day, only 35% cook lentil and it 21% in case of potato. However, coefficients of lentil and potato are not statistically significant and hence are not counted. Raw data also suggests that only 52% of the households are currently using pressure cooker to cook rice while it is about 35% for households cooking lentil and 41% for cooking potato and they do not cook lentil and potato every day.

Table 9: Panel Regression Results

VARIABLES	(1) Daily Consumption of LPG	(2)
Number of guests per day	0.0175*** (0.00251)	0.0211*** (0.00105)
Family size	0.0203*** (0.00157)	0.0208*** (0.000892)
% of times rice cooked with PC (treatment 1)	-0.0147*** (0.00351)	-0.0148*** (0.00141)
% of times lentil cooked with PC (treatment 2)	-0.00856 (0.00884)	
% of times potato cooked with PC (treatment 3)	0.000976 (0.00799)	
Income of the household	7.95e-07 (9.76e-07)	-1.65e-06*** (5.36e-07)
Number of times rice cooked in a day	0.0285*** (0.00715)	0.0487*** (0.00224)
Number of times lentil cooked in a day	0.0173* (0.0100)	
Number of times potato cooked in a day	0.0152** (0.00764)	
Constant	0.181*** (0.0216)	0.131*** (0.00693)
Observations	1,861	20,335
Number of Families	656	1,048

NOTE: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1 SOURCE: Panel regression results are estimated using 14-day monitoring period data with STATA – an econometric software

Using Model 2, it is possible to estimate savings in LPG for households of all sizes. The coefficients of ‘number of guests per day’ is statistically significant implying that with increase in guests in the house, LPG consumption rises. Similarly, coefficient of family size is also significant implying that with increase in family size by one member, there will be a 21g rise in LPG use per day. The income

coefficient is significant but is extremely small and hence ignored while every time of cooking rice in the family increases the use of LPG by 49g.

4.2 All households do not encounter shortage/surplus

Given the average findings indicating a potential 20% reduction in LPG consumption at the household level (see Figure 18), a question arises, whether the refill cycle should be revisited again to leverage these savings and consequently manage LPG more effectively. To address this inquiry, we examined the distribution patterns of LPG usage across households of different sizes for the current distribution groups.

Using the current rate of LPG usage by family groups, Table 10 shows, for example, that while a household of four to five members typically requires 284g of LPG per day, they are receiving an average of 280g per day. Using a normal distribution, we estimate that nearly 45% of households in this family group will encounter shortages of LPG before their next refill cycle. However, it is also true that 56% of families will not encounter any shortage before their next refill date.

Table 10: Critical Analysis of LPG supply at the household level

LPG groups	per day use of LPG (gm)	Per day allocation in a refill cycle (gm)	Shortage / surplus in days within a refill cycle	Percent of HH with shortage / surplus of LPG
1-3 HH size	258	245	2.3	44.8%
4-5 HH size	284	280	0.6	45.5%
6-7 HH size	332	316	1.8	46.3%
8-9 HH size	384	375	0.7	47.9%
10-11 HH size*	443	462	1.1	48.1%
12 and above HH size*	505	522	0.8	47.7%

NOTE: * **red colored** text means surplus – households on average received more gas than what they need. This means that on average 48.2% households of 10-11 size had a surplus of gas allocated to them.

During the field survey, we observed that some households are engaged in using LPG to earn income, such as operating stalls for tea or sharing LPG with others. Our estimates show that the shortage is very small, less than a day. On the other hand, households with family sizes of 10 and 11 will end up with an extra day of gas. This highlights the need for harmonizing the refill cycle according to household sizes.

4.3 Proposed Harmonized Refill Cycle by Family Size

In order to estimate the new refill cycle for households by family size, the regression coefficients are used to calculate net savings in LPG use by family sizes. The simulation is based on several scenarios. Firstly, a baseline or business-as-usual scenario is created under the current behavioural conditions, and then two scenarios are tested using the model. Secondly, Scenario I assumes that UNHCR does not allocate additional LPG for guests. This means that a visiting guest is considered a member of another Rohingya household, resulting in reciprocal savings in another family. Consequently, the allocation of LPG will not account for any guests in the house. Thirdly, currently, refugees do not cook rice with a pressure cooker 100% of the time. Scenario II assumes 100% uptake of using a pressure cooker for cooking rice. This scenario would require additional efforts to promote the use of a pressure cooker for cooking rice. The simulation results are used to propose changes in the LPG refill cycle.

Table 11: Simulation Scenarios for Harmonization of Refill Cycle

Scenario	Assumptions
Baseline or Business-as-Usual Scenario	Households do not need to change their current cooking or social behaviour
Scenario I – No allocation of LPG for guests	There are significant number of guests within the Rohingya families who visit each other from neighbouring camps. Since total number of persons are same, this scenario assumes that LPG allocation will not include allocation of gas for their guests.
Scenario II – rice is cooked with PC only	Households cooked 2-3 times rice for their meal. However, data shows that they do not cook this rice with PC yet. This behaviour can be modified and if all the time, rice is cooked with PC there will be further room for improvement and hence saving LPG.

Using the regression model, the following table (Table 12) summarizes the refill cycle changes for every family sizes. The proposed refill cycle is calculated for every family size under three scenarios: a) baseline or BAU scenario, b) Scenario I – no allocation of LPG for guests; and c) Scenario II – Scenario I + 100% of the time rice is cooked using PC. Table 12 shows the calculation based on these scenarios.

Column (1) of Table 12 shows the family size, column (2), shows the average volume of LPG used per day by the family, column (3) lists the current refill cycle for the family. Column (4) calculates the number of days a 12-kg LPG cylinder will last based on their current consumption rate under BAU scenario. Column (5) estimates the number of days per 12-kg LPG cylinder under Scenario I, and column (6) shows the number of days a 12-kg LPG cylinder will last if Scenario I is superimposed with additional condition that refugee families are persuaded to cook their rice with PC 100% of the time.

Table 12: Proposed revision of refill cycles under different conditions

No of days per cylinder						
Famil y Size	LPG use per day (as is scenario) BAU scenario	Current refill cycle (in days)	Refill cycle based on BAU scenario	No LPG allocation for Guests (Scenario I)	No LPG allocation for guests and 100% PC use for rice cooking (Scenario II)	comments
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	260	49	46	52	53	
2	246	49	49	52	53	Increase refill cycle dates
3	267	49	45	47	49	Increase refill cycle dates
4	275	43	44	45	47	Increase refill cycle dates
5	290	43	41	43	45	Increase refill cycle dates
6	321	38	37	39	40	Increase refill cycle dates
7	340	38	35	36	38	Decrease in refill cycle
8	370	32	32	33	35	Increase refill cycle dates
9	401	32	30	31	32	Decrease in refill cycle
10	436	26	28	28	29	Increase refill cycle dates
11	453	26	27	27	28	Increase refill cycle dates
12	491	23	24	25	26	Increase refill cycle dates
13	516	23	23	23	24	Increase refill cycle dates
14	565	23	21	22	23	Decrease in refill cycle

Table 12 shows under the new harmonized scheme of LPG distribution (Scenario I) few families will see an increase in refill cycle while some might see a decrease in their refill cycle.

5.0 Recommendations

Based on the above analysis, here are the major recommendations that we can draw.

Recommendation 1

Table 12 suggests modifications to both the duration of refill cycles and the implementation of individualized refill cycles for each household. Two proposed revisions are outlined under Scenario I and Scenario II in the table. Scenario I is easy to implement as it only assumes that UNHCR does not allocate additional gas for their guests. This scenario has zero liability since all households within the camps are covered with the allocation of gas. Scenario II, on the other hand, requires further engagement with Rohingya families to persuade them to become accustomed to cooking rice using pressure cookers, hence it requires additional intervention. However, it shows that further savings in LPG are possible if households are prepared to cook rice with pressure cookers only.

Based on this, we propose implementing Scenario I in the camps for all households except those with a family size of 1. Single-person families need a second set of eyes to look after them, and having a guest also provides psychological comfort. Therefore, to avoid potential future costs, such as psychological trauma, we recommend no changes to their current refill cycle. Additionally, many single-person families are also special needs families, requiring additional support to prevent sickness, loneliness, and similar issues.

Recommendation 2

Scenario II is not impossible but requires more effort on the part of the camp management to encourage households to become accustomed to cooking rice using pressure cookers. This can be achieved through additional promotion campaigns conducted at the camp level. While it may be difficult to implement, our suggestion is to provide incentives for households to further reduce LPG use. Additionally, it was evident that many households do not fully understand the refill process. They assume that if they miss their refill date, they might lose their gas supply entirely. Consequently, some households were found to release gas prior to the refill date during field trips. This practice is dangerous and could pose a significant fire hazard.

To mitigate this issue, we suggest the following: develop an incentive scheme to encourage households to refill their gas later than the due date. For this, additional in-kind or quasi-cash incentives may be given to the families. For example, a delay of one day could result in a minimum of 250g of LPG. This cost-saving measure, if half of the saving is passed on to the refugee families in the form of nutritious food coupons such as milk and eggs, would reduce the overall cost of managing the camps through subsequent benefits in terms of health and medical expenses. We recommend that UNHCR consider this or a similar measure to incentivize Rohingya families to conserve more LPG.

Furthermore, the carbon footprint of LPG (using lifecycle analysis) based on production, burning, and distribution is not insignificant. Saving LPG may contribute to reducing CO₂ emissions, and hence it might be possible for UNHCR to request carbon emission credits from companies.

Recommendation 3

The data analysis reveals that a significant portion of the benefits from introducing pressure cookers (PC) in refugee households is derived from using the PC for cooking rice. However, the observation that households use the PC for cooking rice only 38% of the time, on average, indicates room for improvement in adoption. A possible impact is a further reduction in the cost of LPG by another 7% if households are incentivized to cook their rice meals using pressure cookers.

We, therefore, recommend continuing and intensifying campaigns targeting the promotion of cooking rice with pressure cookers. Repeated push-through campaigns can play a crucial role in raising awareness and encouraging households to make more frequent use of the pressure cooker for this specific cooking activity. This has the potential to further save LPG by an additional 7% per day if households consistently use the pressure cooker every time they cook rice. This underscores the importance of focusing efforts on this particular aspect, as it not only contributes to resource efficiency but also aligns with the overall goal of reducing LPG consumption and associated costs.

In the ongoing campaign, it might be beneficial to analyse the reasons behind the current usage patterns and address any barriers or misconceptions that may be hindering broader adoption. Tailoring the messaging to highlight the benefits of using the pressure cooker for cooking rice, such as cost savings and environmental impact, could further motivate households to embrace this practice. Regular monitoring and evaluation of the campaign's impact will be essential to gauge its success and make adjustments as needed.

Recommendation 4

Furthermore, we propose changing the current refill policy from family size groups to refill cycles based on each unique family size (ranging from 1 to 14 members per family). This strategic adjustment aims to encourage families to consistently use pressure cookers for all their rice meals, maximizing the benefits of reducing LPG costs.

Implementing this change could result in an approximate 18.47% reduction in the LPG volume from pre-pressure cooker levels. The shift in refill policy introduces additional incentives for families to adopt pressure cooker usage consistently, tying refill cycles directly to family size. This approach reinforces the link between efficient cooking practices and cost savings, providing families with a clear economic incentive to embrace the recommended behaviour.



Food and Agriculture
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HWC Baseline Survey Report

Strengthening community-based human–wildlife conflict management in Cox’s Bazar



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Introduction

Elephants are keystone species that play a vital role in maintaining ecosystem function. In Bangladesh, the Asian elephant is critically endangered due to the shrinking of its natural habitat caused by fragmentation (IUCN Bangladesh, 2015). According to a census conducted by IUCN Bangladesh in 2016, the population of Asian elephants in the Chittagong region, Chittagong Hill Tracts, and Cox's Bazar is estimated to be between 210 and 330 individuals. As large mammals, elephants require a significant amount of food each day, prompting them to move from one forest to another through corridors. In Cox's Bazar, there are 03 identified corridors; however, these have been severely impacted by infrastructure development and settlements. Additionally, the creation of the Rohingya refugee camp has further obstructed a crucial corridor, isolating about 40 wild elephants. Consequently, the conflict between humans and elephants in this region has intensified, adversely affecting the elephant population and human property. Alongside elephants, other wildlife animals are also affected by losing core habitats including carnivore mammals, primates, birds, venomous and non-venous snakes, turtles, and amphibians. As a result, conflicts such as snake bites, crop damage by wild animals, and the intentional killing of snakes and other wild animals by humans in this region also increase over time.

To address human-elephant conflicts, IUCN Bangladesh has been collaborating with UNHCR in the Rohingya camps and surrounding host areas since 2018. Establishing coexistence between humans and elephants is vital for protecting the elephant population in this region. In October 2024, IUCN initiated a project with FAO titled "Strengthening Community-Based Human-Wildlife Conflict Management in Cox's Bazar." The project aims to engage the local community and the Forest Department through capacity development to reduce conflicts and ensure the protection of elephants and other wildlife animals. Additionally, support will be provided for non-preferred crops to vulnerable farmers in conflict-prone areas. A key activity in implementing this project involved conducting a baseline survey to identify areas in the Cox's Bazar South Forest Division that are prone to human-wildlife conflict (HWC).

Method

Survey plan and schedule

To identify the human-wildlife conflict-prone area, a detailed baseline survey was conducted in the Cox's Bazar South Forest Division covering the four administrative sub-districts including the Cox's Bazar Sadar, Ramu, Ukhiya and Teknaf Upazila. The survey was carried out for 12 days of active field work starting from 26 October to 07 November 2024 (Table 1). During this survey, 12 enumerators engaged who had experience with the questionnaire survey and got to know about the local dialect of the Cox's Bazar region. However, IUCN experts thoroughly described the method of the HWC survey and trained them on data collection tools before fieldwork (Figure 1).

Table 1: HWC survey plan and schedule

Date	Forest Range	Forest Beat
26-October-24	Rajarkul	Dariardighi, Upper Reju, Rajarkul
27- October -24	Panerchara, Doapalong	Panerchara, Tulabagan, Dhoapalong, Khuniapalong
28- October -24	Ukhiya	Dochari, Thainkhali, Ukhiya Ghat

HWC Survey Report

29- October -24	Whykheong	Shaplapur, Monkhali, Raikhiyong, Whykheong
30- October -24	Teknaf-Sadar	Teknaf-Sadar, Nhila, Madhya Nhila, Mochoni
31- October -24	Shilkhali	Shilkhali, Mathabhanga, Rajachara
2-November-24	Inani	Swankhali, Choto Inani, Iani
3- November -24	Inani, Cox's Bazar Sadar	Himchari, Rajapalong, Jaliapalong
4- November -24	Cox's Bazar Sadar	Kalatali, Chainda, Linkroad, Gilingja
5- November -24	Gap filling	Gap filling
6- November -24	Gap filling	Gap filling
7- November -24	Gap filling	Gap filling

HWC data collection

To delineate the HWC-prone area, a total of 108 transects were created which covered 9 forest ranges and 33 forest beats in Cox's Bazar South Forest Division (Figure 2). The transects were outlined in a way to avoid the forest area and mainly focus on the buffer zones, households, and cultivated areas where conflicts mostly occurred by the elephants and other wild animals. Previous IUCN survey results on human-elephant conflict (2021) in this region were used as a baseline for selecting transects in this HWC survey.



Figure 1: Field demonstration with enumerators on the HWC survey

HWC data was collected through a questionnaire survey targeting households and croplands (Figure 3). Besides, the footprints and dung data were also collected to understand the regular movement of elephants in recent times and validation of the response from the local people. The nature and scale of damages were determined through types of damage and frequency of damage within in last one year by the elephants. The injury and causality of humans were also taken to demark the intense HEC-prone areas. Additionally, damage caused by the other wildlife animals and the nature of interventions were delineated from the response by affected

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people. However, the detailed questionnaire is available in the Annex. The HWC data was collected using ArcGIS Survey123 application whereas SW Maps were followed to access the transect areas and record tract lines in the field (Figure 2). Finally, all GPS points were used to mark the HWC-prone area through mapping.

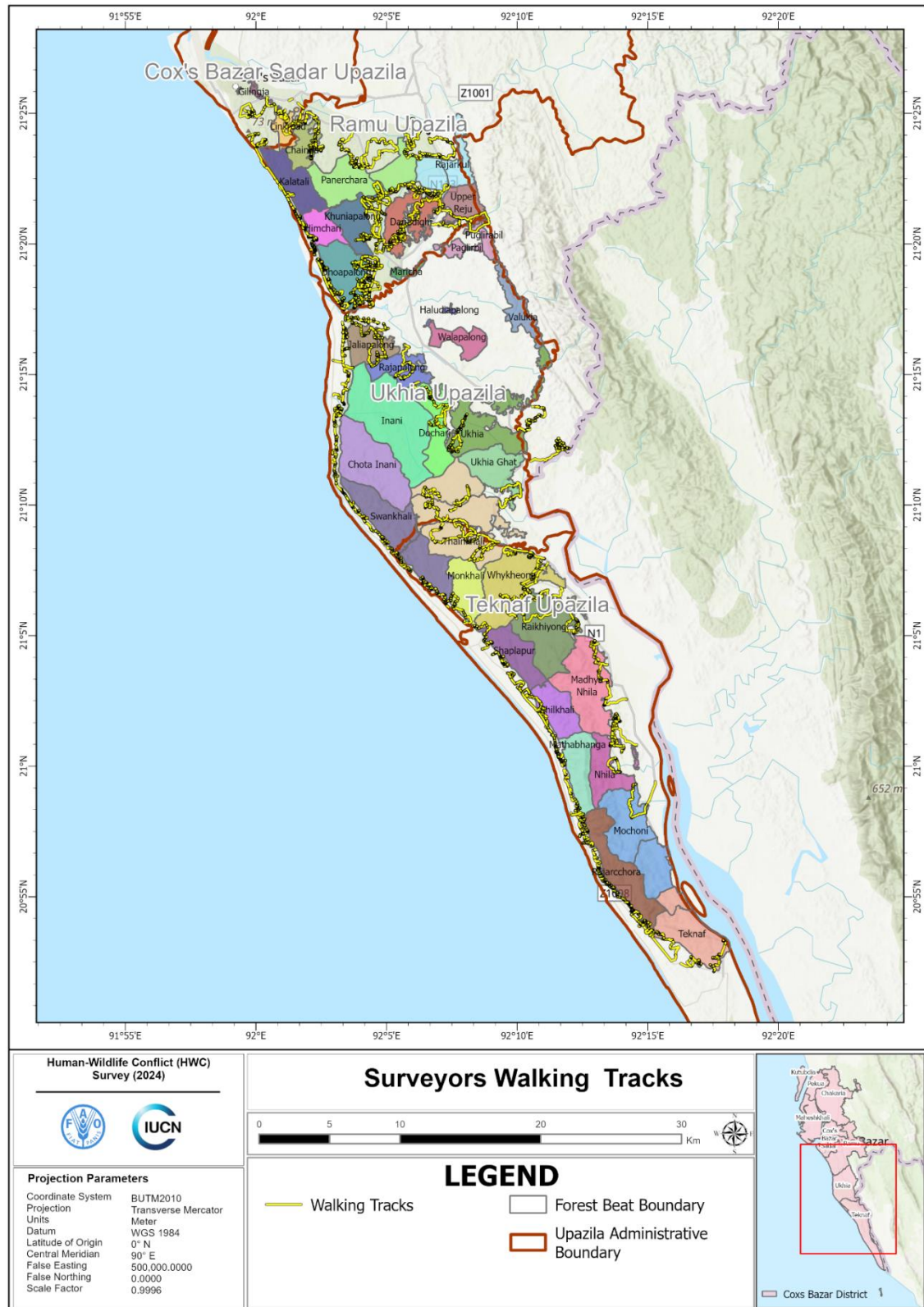


Figure 2: Survey tracts of the HWC survey in Cox's Bazar South Forest Division



Figure 3: HWC data collection by the enumerators



Figure 4: FAO visit during the HWC data collection

Result

A total of 954.87 km area was covered within 12 days to collect the HWC information from the four sub-districts including Cox's Bazar Sadar, Ramu, Ukhiya, and Teknaf. This survey resulted in 4204 observations, with 3234 respondents from households, 607 cultivated lands, and, 363 direct movement signs of elephants including dung (53) and footprints (310) (Figure 5; Table 2). From the direct signs, it was evident that elephant movement in human-dominated areas was relatively high in Teknaf upazila followed by Ukhiya, Ramu, and Cox's Bazar Sadar (Table 2).

Table 2: Overview of the HWC data collection in Cox's Bazar area

Upazila	Cropland	Dung	Footprint	Household	Total
Cox's Bazar	37	17	28	354	436
Ramu	177	9	48	940	1174
Ukhiya	161	10	96	874	1141
Teknaf	232	17	138	1066	1453
Total	607	53	310	3234	4204



Figure 5 Humam wildlife conflict data collection (a) footprint (b) dung (c) cropland farmer (d) household

Human-elephant Conflicts in Cox's Bazar

The HEC frequency over the past year was used to delineate the scale of the conflict zones in four Upazilas. To assess the scale, five categories were applied: very high (frequency >150 times), high (101-150 times), moderate (51-100 times), low (26-50 times), and very low (1-25 times) (Table 3). According to this categorization, the Shilkhali area was identified as a very high HEC-prone area, where 33 respondents reported more than 150 instances of elephant visits and damage (Figure 6,7 and 8; Table 3). Following Shilkhali, Inani was identified as another high HEC-prone area, where 49 respondents reported 101-150 instances of elephant damage in the past year (Figure 7; Table 3). A very high HEC frequency was also observed in the Rajakul area of Ramu Upazila (Table 3). In contrast, only low and very low categories of HEC frequency were recorded in Cox's Bazar Sadar Upazila. (Figure 6; Table 3).

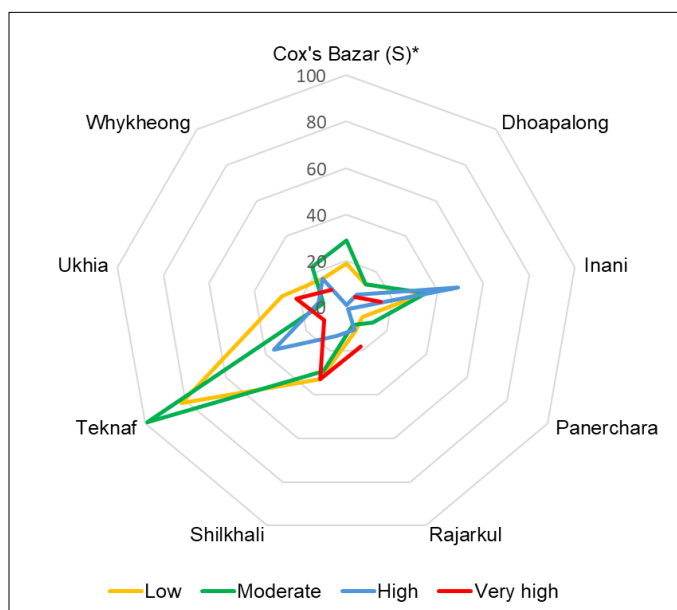


Figure 6 : Human-wildlife conflict in different forest ranges in Cox's Bazar

Table 3: Scale of the HEC-frequency in Cox's Bazar

Upazila	Range	The number of respondents mentioned on the HWC frequency					Total
		Very low (1-25)	Low (26-50)	Moderate (51-100)	High (101-150)	Very high (>150)	
Cox's Bazar	Cox's Bazar Sadar	69	1	-	-	-	70
Cox's Bazar	Ramu	141	18	29	1	-	189
Ramu	Dhoapalong	206	13	13	7	6	245
Ramu	Rajarkul	137	11	8	10	18	184
Ramu	Panerchara	108	8	13	1	-	130
Ukhiya	Inani	244	34	35	49	15	377
Ukhiya	Ukhia	149	28	10	12	22	221
Teknaf	Shilkhali	86	33	29	13	33	194
Teknaf	Teknaf	329	82	99	36	11	557
Teknaf	Whykheong	190	16	23	16	10	255
Teknaf	Grand Total	1659	244	259	145	115	2422

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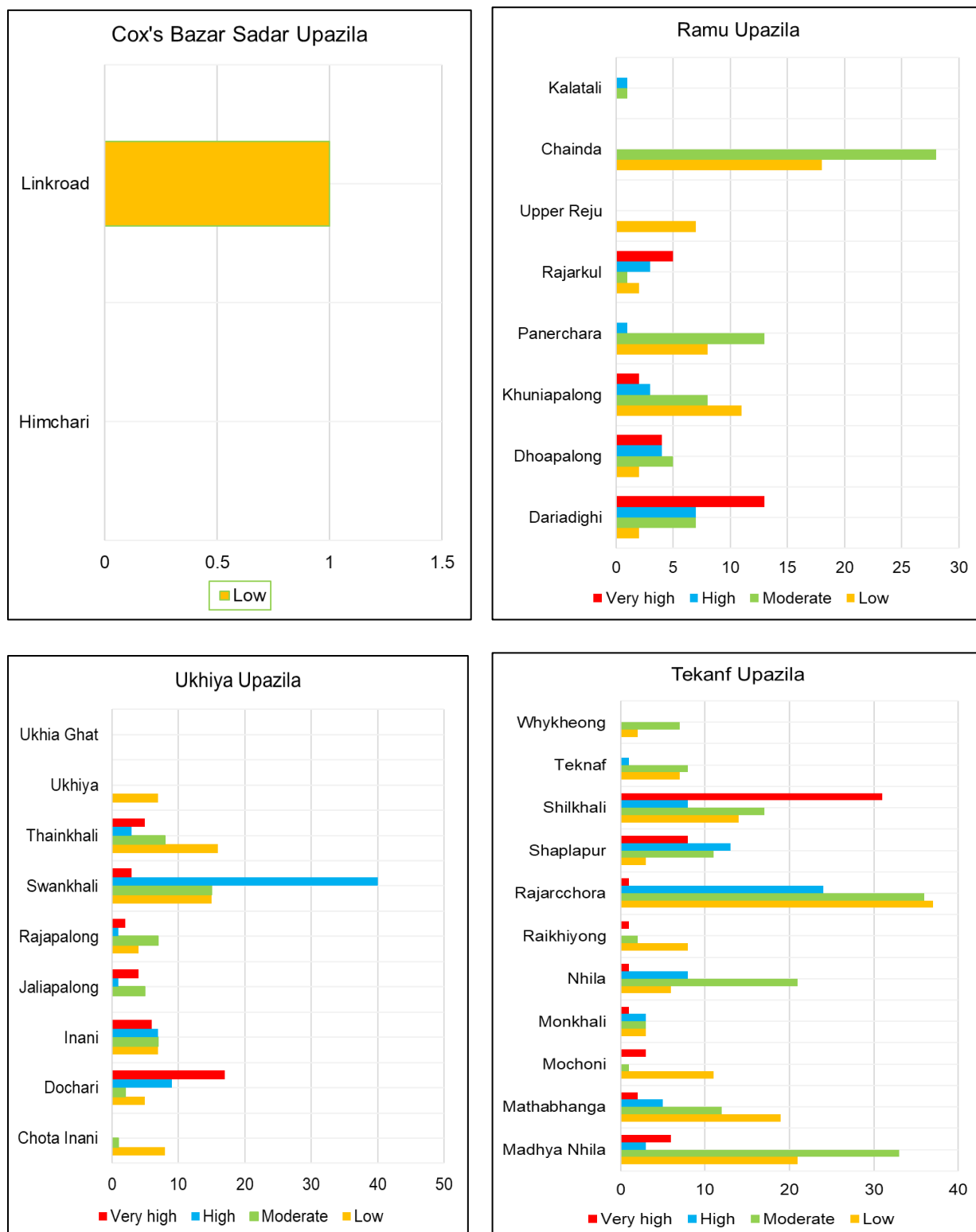


Figure 7: HEC in four subdistricts in Cox's Bazar

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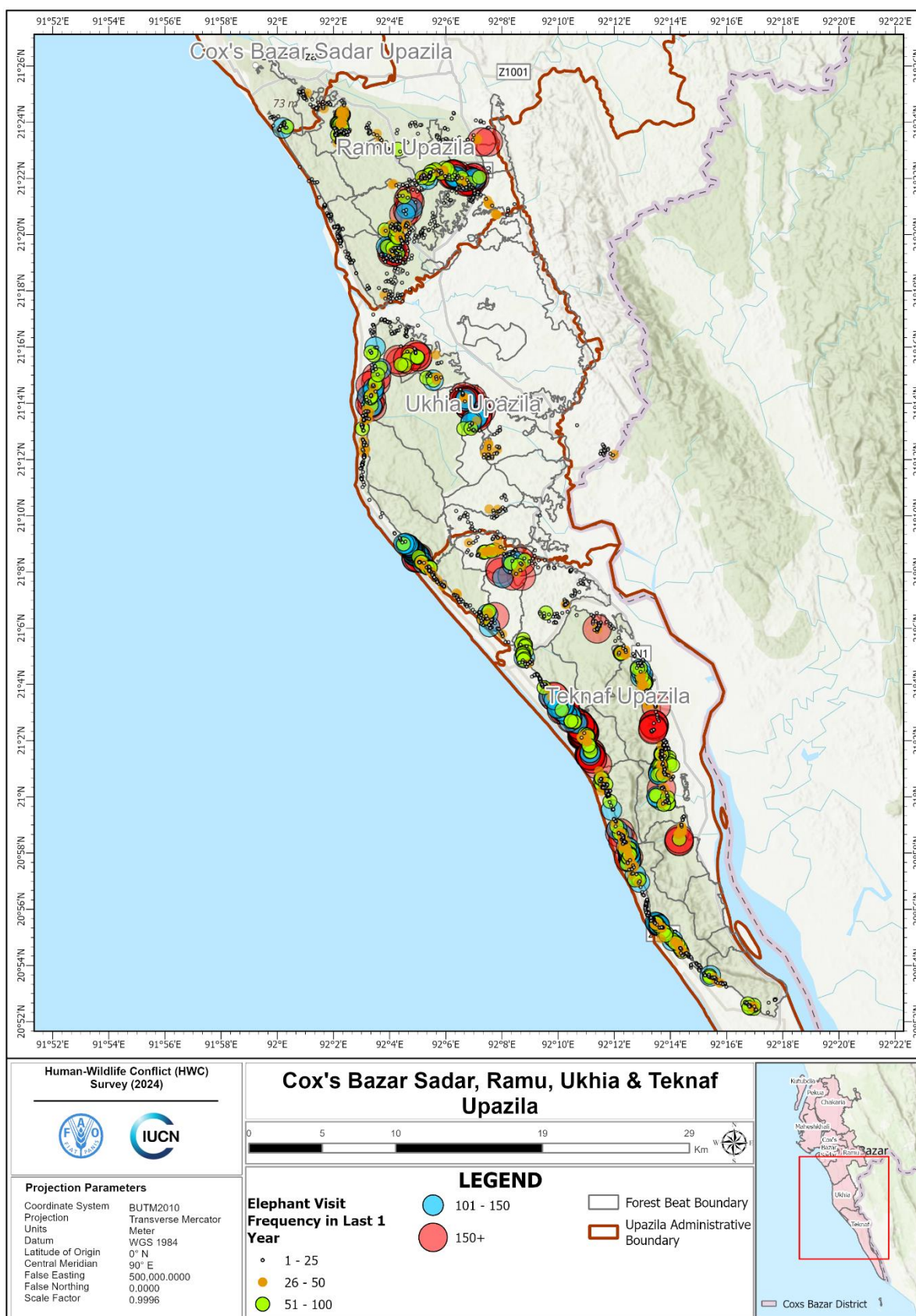


Figure 8: Scale of the HEC in four subdistricts in Cox's Bazar

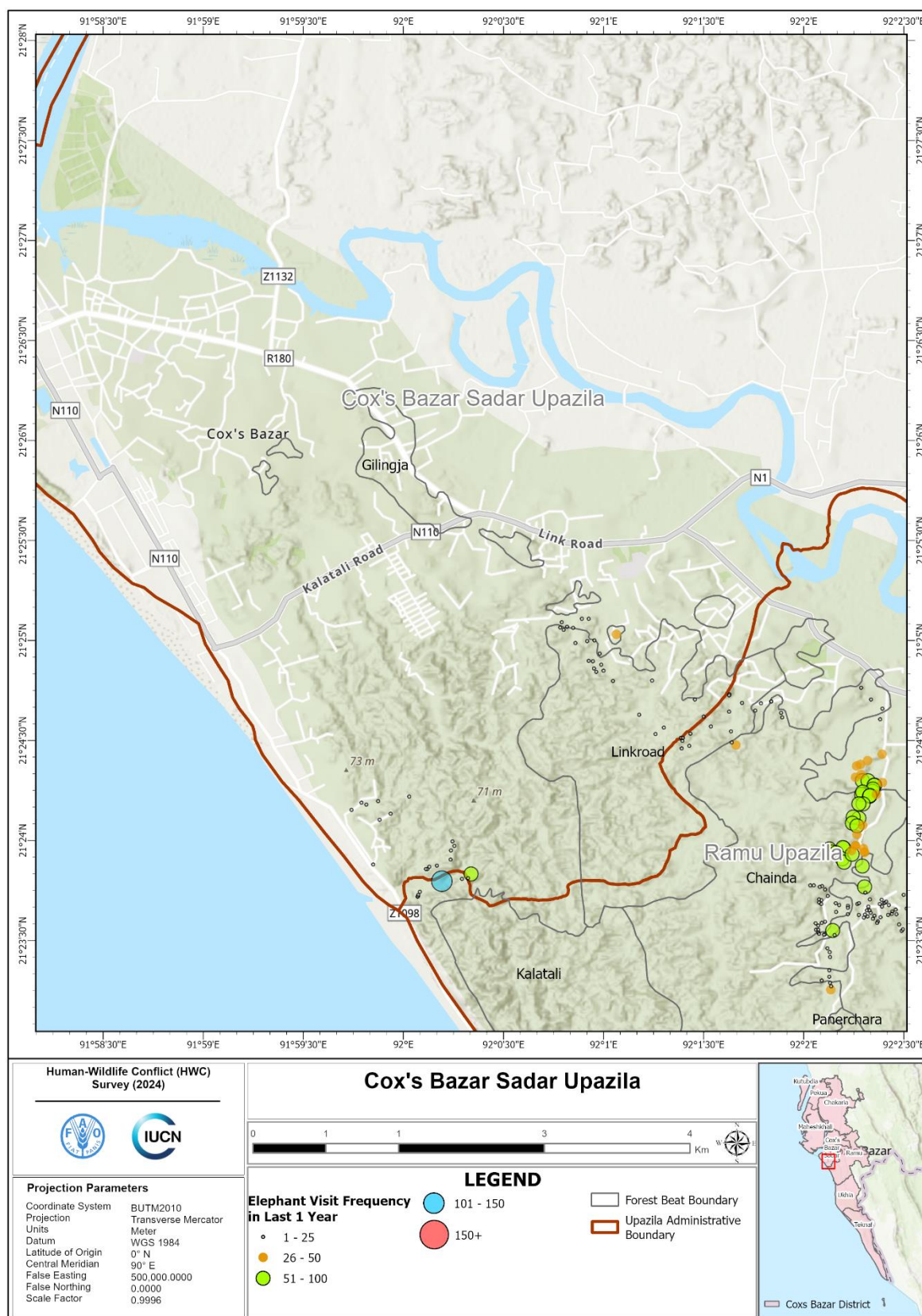


Figure 9: HEC in the Cox's Bazar Sadar Upazila

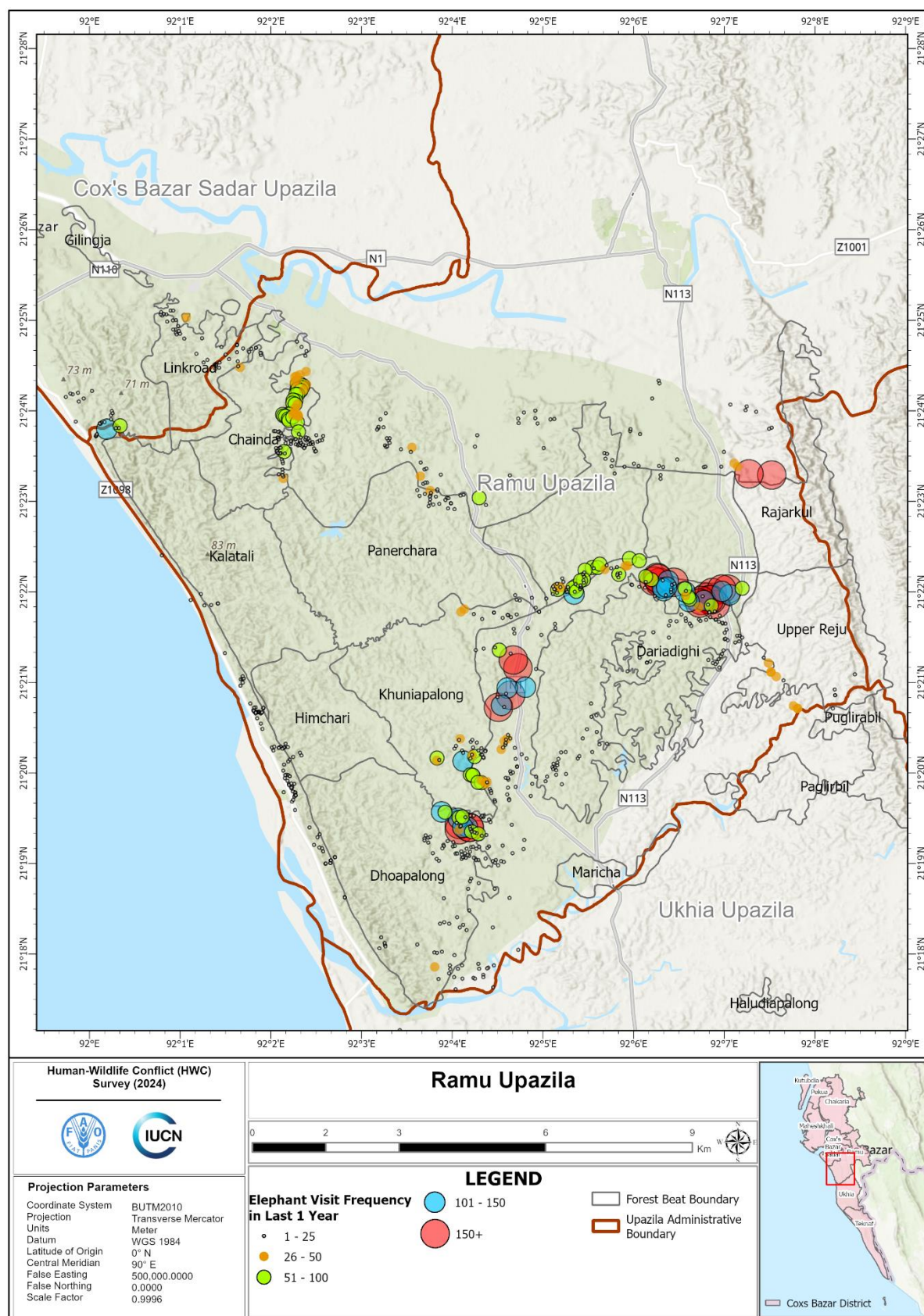


Figure 10: HEC in the Ramu Upazila

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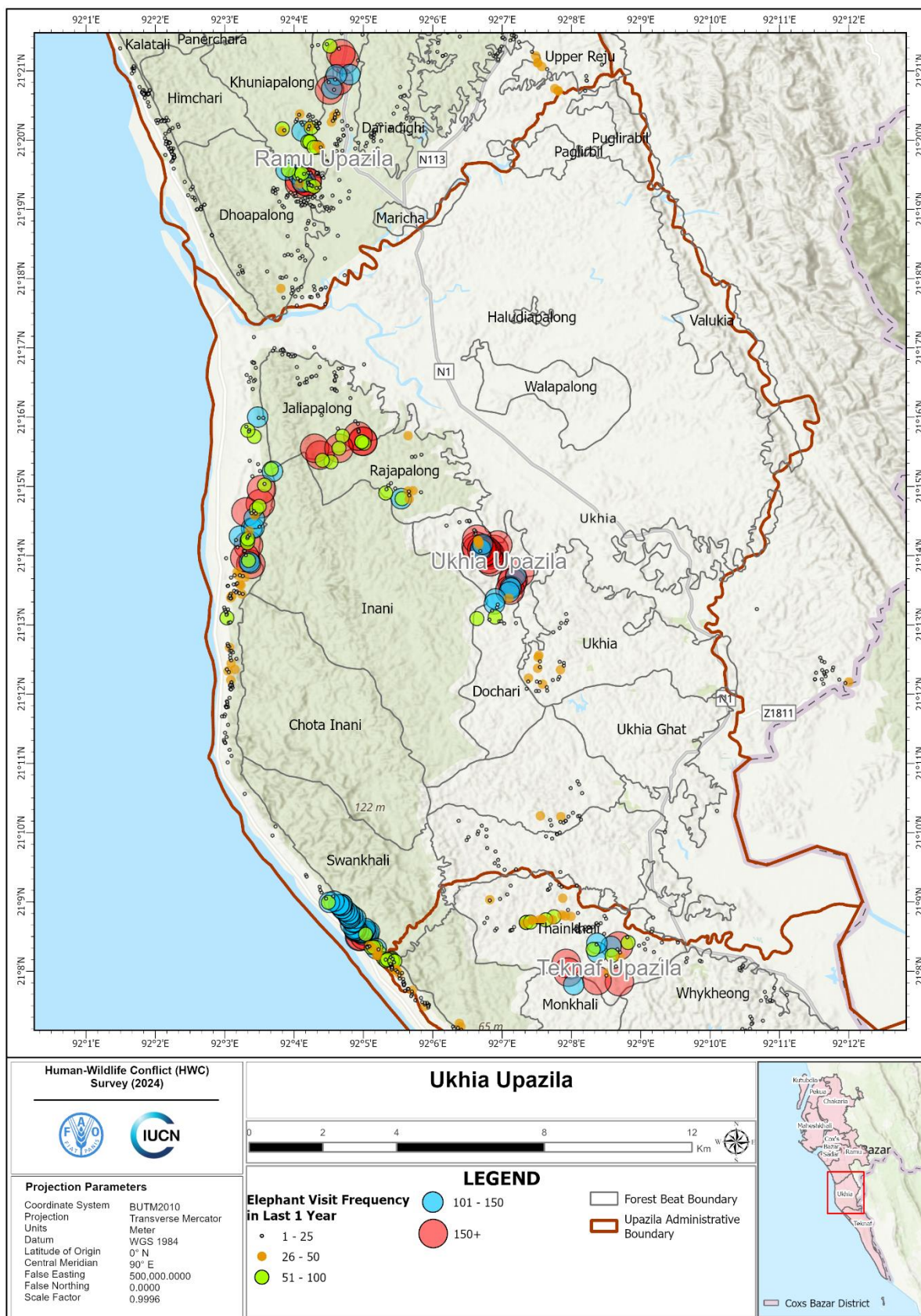


Figure 11: HEC in the Ukhiya Upazila

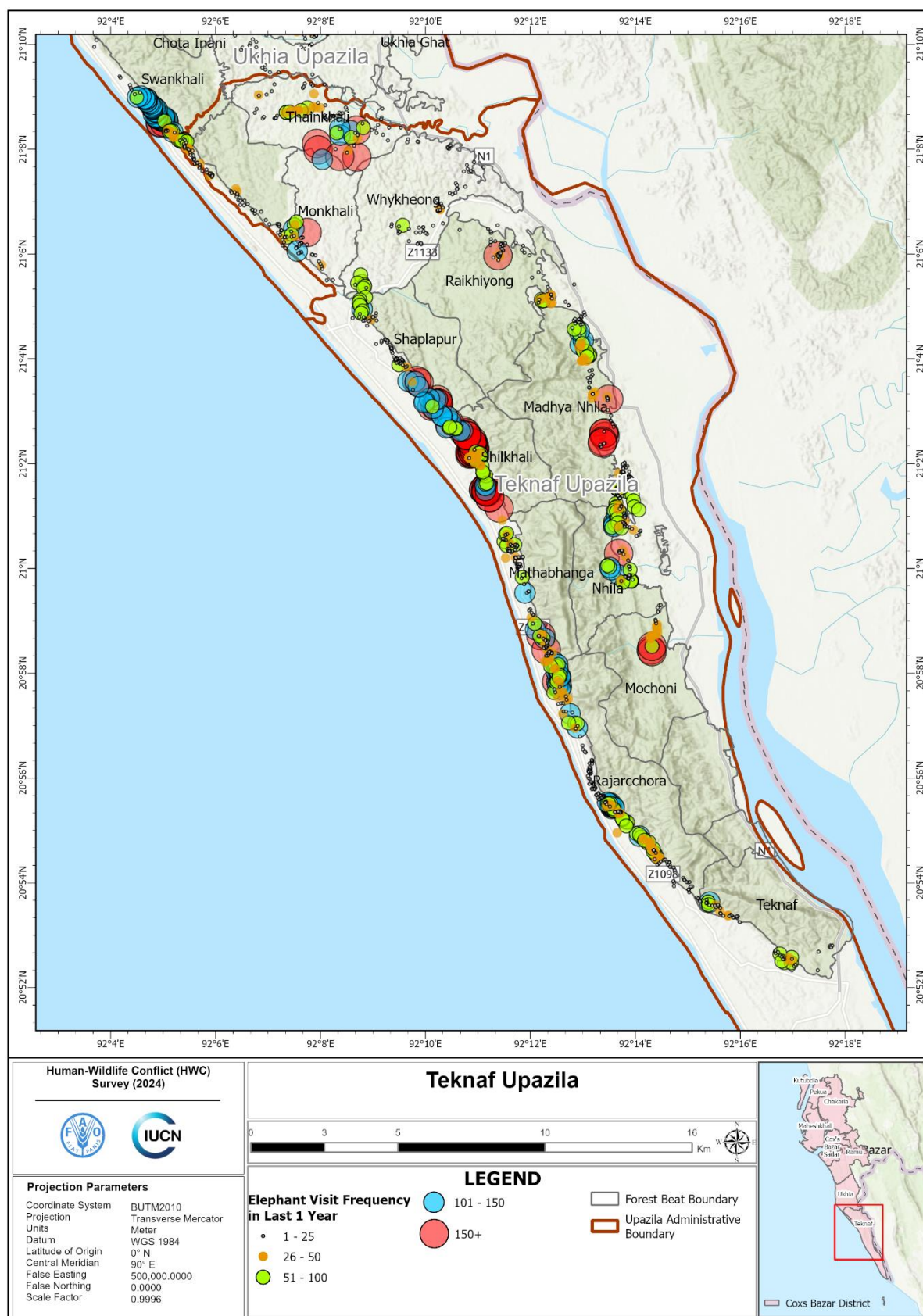


Figure 12: HEC in the Teknaf Upazila

Human-elephant conflict-prone areas following the forest beats

Overall, Shilkhali and Rajachara were found to be very high and high categories of the HEC-prone areas respectively, under the Teknaf Upazila (Figure 7; Figure 12). In Ukhiya, the HWC frequency was categorized as very high and high in the Dochari and Swankhali areas respectively (Figure 7; Figure 11). Although HWC frequency was low in Ramu, Dariadighi area was found to be a high conflict zone where both very high and high categories responses were quantified than other areas (Figure 7; Figure 10). Only a low category of HWC frequency was found in the Liankroad area from Cox's Bazar Sadar Upazila (Figure 7; Figure 9).

Nature of damage by wildlife janimals

Most of the respondents reported that elephants primarily damaged the homestead plantation while roaming around the household areas at night (Figure 13). Occasionally, they damage the households of the local people while seeking stored paddy or vegetables. Raiding crops and vegetables was also very common during the harvesting season. Human injury caused by wild elephants is rare but can occur when locals attempt to deter them during household invasions or crop raiding (Figure 13).

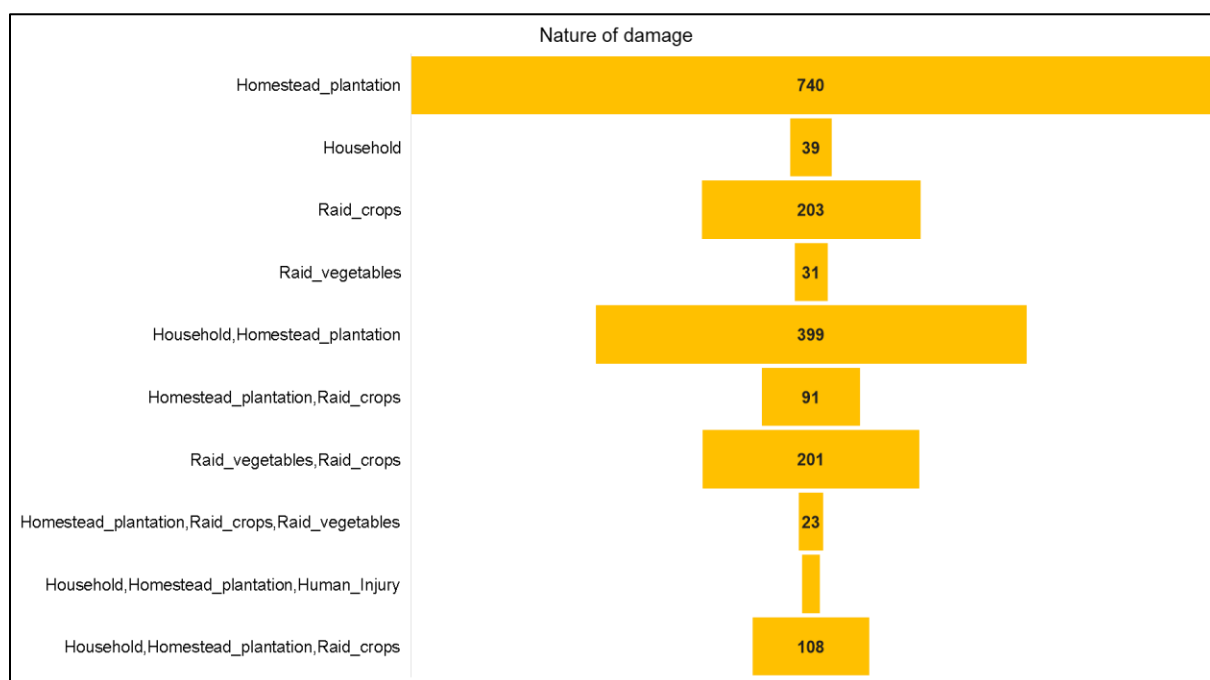


Figure 13: Types of damages by the wildlife animals

Spatial types of damage by wildlife animals

While comparing the nature of damages, it was evident that they were spatially varied in Cox's Bazar area. The homestead plantation was mostly damaged in the Inani and Teknaf range area whereas household invasion was prominent in Teknaf followed by Shilkhali and Ukhiya (Figure 14). Although crop raiding was common in different ranges, Dhopalong was the most affected area followed by Whykong (Figure 14). Overall, vegetable damage was found to be high in Ukhiya after Teknaf range. Finally, human injury tends to be high in the Shilkhali area followed by the Inani and Teknaf (Figure 14).

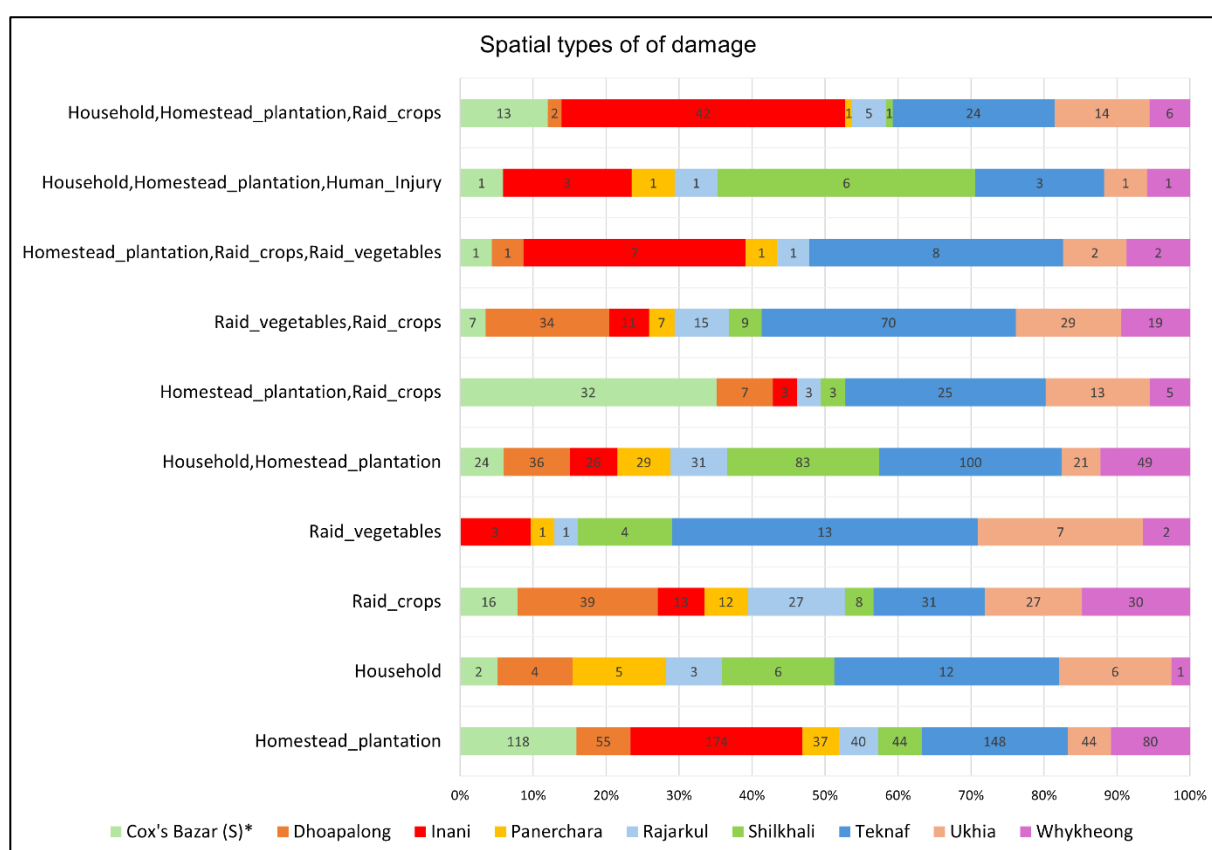


Figure 14: Types of damages in Cox's Bazar area

HWC conflict related to other wild animals

Overall, 2260 respondents mentioned the damage to other wild animals including the Wild Boar, Jungle Cat, Small-Indian Mongoose, Asian Golden Jackal, and Indian Porcupine. Some respondents also mentioned Pythons and monkeys, although they were aware of the species. The nature of the damages was mainly poultry (chickens and ducks), occasionally goats, and crops and vegetables. However, the Teknaf was the most HWC-prone area in terms of damage caused by other wild animals rather than elephants and followed by Doapalalong and Inani range areas (Figure 15; Table 4). In contrast, Shilkhali, Panerchara and Rajarkul were the least HWC-prone areas (Figure 15; Table 4). However, it is difficult to understand the scale of conflict between humans and other wildlife in this region based on the questionnaire survey because it persists in all forest ranges (Figure 16). A long-term study is needed implying camera traps to delineate the conflict scenario of other wildlife animals.

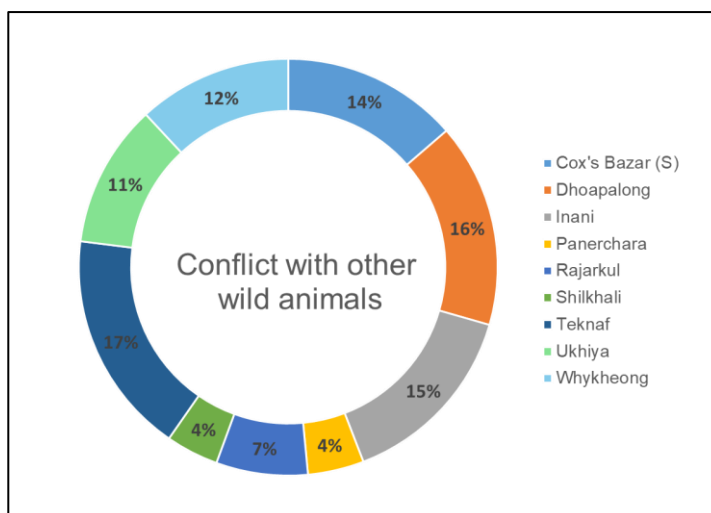


Figure 15: Conflict scenario of the other wildlife

However, the Teknaf was the most HWC-prone area in terms of damage caused by other wild animals rather than elephants and followed by Doapalalong and Inani range areas (Figure 15; Table 4). In contrast, Shilkhali, Panerchara and Rajarkul were the least HWC-prone areas (Figure 15; Table 4). However, it is difficult to understand the scale of conflict between humans and other wildlife in this region based on the questionnaire survey because it persists in all forest ranges (Figure 16). A long-term study is needed implying camera traps to delineate the conflict scenario of other wildlife animals.

Table 4: HWC through other wildlife animals in Cox's Bazar region

Forest Range	Number of respondents
Cox's Bazar Sadar	308
Dhoapalalong	358
Inani	332
Panerchara	98
Rajarkul	160
Shilkhali	92
Teknaf	392
Ukhiya	251
Whykheong	269
Grand Total	2260

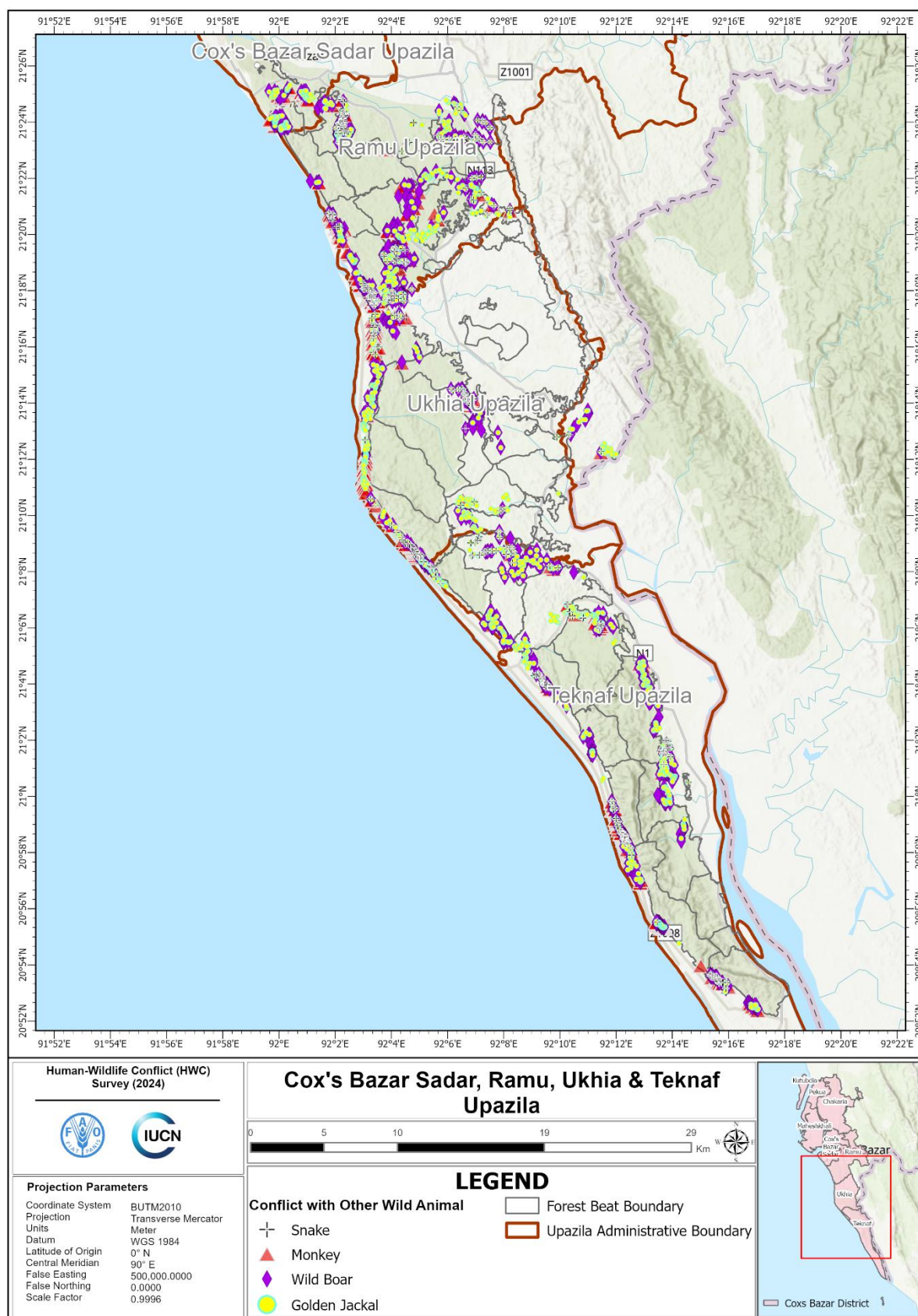


Figure 16: Conflict between human and other wild animals in Cox's Bazar

Way forward from the HWC-baseline survey

- Identification of the 1400 forest-dependent households (HHs) for the non-preferred crop support.
- Selection of the 150 HHs to capacitate wildlife non-preferred crop farming.
- Identification of the 100 HHs to provide logistic support and training to mitigate human-wildlife conflicts.

Annex

Strengthening community-based human–wildlife conflict management in Cox’s Bazar

Human-Wildlife Conflict Baseline (HWC) Survey 2024

Questionnaire

General

1. **Date:**
2. **Name of the Surveyor:**
3. **Type of response:**
 - Household
 - Cropland
 - Dung
 - Footprint

HWC information

4. **Does elephant visit in your area?**
 - Yes
 - No
5. **If yes, do they cause any damage?**
 - Yes
 - No
6. **What kind of damages are caused by elephants?**
 - Raid crops
 - Raid vegetables
 - Homestead plantation
 - Household
 - Human injury

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- ☐ Human death
- 7. How many times elephants came in last one year?**
- 8. Do elephants come and damage in a regular basis?**
 - ☐ Yes
 - ☐ No
- 9. Does an elephant die in your area within the last one year?**
 - ☐ Yes
 - ☐ No
- 10. Do other wild animals cause any damage?**
 - ☐ Yes
 - ☐ No
- 11. If yes, which wild animals?**
 - ☐ Wild Boar
 - ☐ Golden Jackal
 - ☐ Monkey
 - ☐ Porcupine
 - ☐ Snake
 - ☐ Others
- 12. If others, please mention them.**
- 13. What kind of damage is caused by the wild animals?**
 - ☐ Crop
 - ☐ Vegetable
 - ☐ Poultry
 - ☐ Human injury
 - ☐ Human death
 - ☐ Others
- 14. If others, please mention them?**
What kind of damage is caused by the other wild animals?
 - ☐ Crop
 - ☐ Vegetable
 - ☐ Poultry
 - ☐ Human Injury
 - ☐ Others

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15. If others please mention?

16. GPS point: