Environmental Assessment Report

IFRC Bangladesh Population Movement Operation 2017

Summary and Recommendations

An environmental specialist was deployed for one month as part of the BDRCS and IFRC Population Movement Operation in Cox's Bazar, Bangladesh. The deployment had duel objectives; of (1) completing an initial assessment to identify the key environmental issues associated with the PMO, and (2) to suggest options to improve environmental outcomes for the ongoing operation. The key environmental issues identified were cooking fuel, erosion and landslips, water and sanitation, solid waste management and human wildlife conflict. The recommendations improve the environmental outcomes of the PMO are given below.

Cooking Fuel

- Provision of LPG as cooking fuel to camp communities and targeted members of host communities will significantly reduce adverse environmental impact of the camps
- For maximum environmental benefit LPG should be provided to all camp inhabitants closely linked to other agencies and be associated with a ban or restrictions on firewood collection
- Provision of LPG should also include a safety education program to ensure safe and efficient use of the resource, including investigation into shelter design to ensure adequate airflow and prevent build-up of carbon monoxide.
- Stove parts that may wear out and cause heightened risks such as hoses or valves should be freely available

Erosion and Landslips

- Relocation of households from areas of high landslide risk to areas lower risk as identified by the ADPC study should be conducted in association with other agencies
- Additional large scale earthworks to reduce the risk of landslips including drainage and other water management work should be conducted before the onset of the monsoon season
- Planting of ground cover and deep rooted plant species is important to prevent surface erosion and landslides in future years
- Conducting investigations into the possibilities of reducing sediment outflows into waterways and agricultural land during flood periods may reduce the likelihood of negative impacts on the host communities

Water and Sanitation

- A comprehensive survey of water quality of the current hand pumps and water sources across the camp is required including an investigation of sustainability of shock treatment of contaminated pumps
- A groundwater monitoring plan to assess the changes of water level and detect changes in salinity and contaminants should be set up with a key focus on sustainably monitoring the system and reporting the results
- Education campaigns are required to change the water use habits of the camp population to distinguish between drinking water and water for other uses

Solid Waste Management

- Develop a waste management plan for all waste generated by the PMO operations including ERU operations taking into account the limited facilities within the Cox's Bazar district
- Work with UNDP waste specialist and Cox's Bazar civil systems to develop waste management solutions for the camps including recycling of plastic products
- Investigate the possible synergies of combining in camp waste management activities with cash for work programs

- Develop end-of-life/life cycle plans for all items, and packaging, purchased and imported as part of an emergency response
- Develop minimum standards for waste management for warehouse operations

Human Wildlife Conflict
- Provide training to key members of PMO staff to better understand how to best react to wild elephant encounters

Other Issues
- Monitor the price and supply of bamboo to ensure price spikes do not adversely impact response operations
- Investigate the efficacy of pre-treating bamboo before distribution
- Plan for contribution to restoration efforts
- Ensure restoration plans fit with government plans, have community support and are ecologically sound

Deployment Assessment
- Deployment of an environmental specialist with RCRC operations can achieve significant environmental gains both in the ongoing operation and identifying issues for future improvement
- A one month deployment allows for the collection of information and the identification of key issues however it does not allow time for interventions to be instituted
- Deployment of an experienced environmental specialist with a strong understanding of RCRC systems allows for efficiency in identifying issues and instituting solutions in time limited situations

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Introduction

As of 8 November 2017, the Inter Sector Coordination Group (ISCG) reported that 611,000 people displaced from Rakhine State had moved across the border into Bangladesh. This is an addition to the 210,000 people living in in the Cox's Bazar region who had moved from Rakhine State prior to this most recent influx. The majority of the population moved to Ukhia and Teknaf upazilas of Cox's Bazar district in either collective sites or in dispersed setting within the host communities. The greatest concentration of people moved into what became the Kutapalong Extension which greatly increased the size of the original Kutapalong Camp had been in existence for 20 years.

In response to the influx of people from the Rakhine State the International Federation of the Red Cross (IFRC) supported the Bangladesh Red Crescent Society (BDRCS) to initiate the Population Movement Operation (PMO). The PMO operation was a categorized on 11th of September as crisis level 'Red' on the IFRC Emergency Response Framework, implying that the situation was critical. The 9 November 2017 revision of the Emergency Plan of Action aimed to meet the humanitarian needs of 200,000 people and has an overall operation budget of CHF 33,516,627. Global response tools were deployed to provide immediate support; including:

- Head of Emergency Operations (HEOps)
- Field Assessment and Coordination Team (FACT)
  - Team Leader
  - Cash Transfer Programme
  - Communications
  - Community Engagement and Accountability
  - Health
  - Information Management
  - IT/Telecom
  - Logistics
  - Public health in emergencies (PHiE)
  - Relief
  - Shelter
  - Water, sanitation and Hygiene (WASH)
- Emergency Response Units (ERUs)
  - WASH M40 (human resource + lab)
  - WASH MSM20 (human resource)
  - 2 RC Emergency Clinic
  - ERU RC Emergency Hospital
  - ERU Relief Benelux Red Cross
- Global surge support
  - Communications
  - Finance
  - Security
  - Admin
  - Protection, Gender and Inclusion
- PMER
- Regional Disaster Response Team (RDRT)
  - Logistics
  - Relief
  - WASH (3)
  - PGI
- Danish Red Cross extension of camp accommodation team

Cox's Bazar has monsoonal climate that is warmer and wetter in the middle of the year and comparatively dry and cool at the end of the year. Although the temperature is relatively constant year round the rainfall varies greatly with monthly averages around 10 mm during the dry months of December and January rising to 900 mm per month during the monsoon in June and July.

The Kutupalong extension is situated in an area of low, steep sided hills divided by narrow flat bottomed valleys with ephemeral streams depended on immediate rain fall. The host communities used the broader valley areas for paddy rice fields and some areas have also been dammed, creating small ponds used for irrigation and fish farming.

The Kutupalong extension is positioned on the edge of and partially within the Teknaf Wildlife Sanctuary which is classed as a critical biodiversity area. The 11,615 ha sanctuary was established in 1983 to protect the areas wild Asian Elephants. The nearby Himchari National Park (1,729 ha) and Inani Protected Area (7,700 ha) are also likely to be affected by the population influx.

Green Response is an IFRC initiative lead by Swedish Red Cross. The goal of the Green Response Initiative is to improve the environmental outcomes of Red Cross Red Crescent activities while still retaining the primacy of the Movements lifesaving and relief operations. As part of the Green Response Initiative an Environmental Specialist was deployed to the PMO operation for one month from 22nd of November until the 15th of December.

The deployment had duel objectives; of (1) completing an initial assessment to identify the key environmental issues associated with the PMO, and (2) to suggest options to improve environmental outcomes for the ongoing operation. This report outlines the activities and findings from the deployment of the environmental specialist. It should be noted that given the short timeframes and constraints of the deployment it was not possible to conduct a comprehensive environmental assessment of the PMO.

Unusually the broader response operation had a number of environmental practitioners working for a number of key agencies. Primarily these included one month deployments by UNHCR of an Energy and an Environmental Specialist. FAO deployed an Emergency Program Coordinator and an Environmental Field Advisor was provided by MSB for the Interagency Hub. In addition UNDP undertook to conduct a Rapid Environmental Assessment in association with UN Women and UNOCHA and also WFP conducted a Safe Access to Fuel and Energy Initiative investigation.

Key Environmental Issues

The arrival of over half a million people onto what was previously forest and farmland, of course, has significant negative environmental impacts. Without a long term environmental study it is not possible to fully elucidate this impact or the impact of the efforts taken to assist the newly arrived population. However it is possible, through short term observation and reference to previous similar events, to identify key environmental issues that may successfully be addressed to reduce the negative impact on the immediate and surrounding environment. It is important to focus attention on those issues that can reasonably addressed. Whilst there are larger and more intractable environmental issues associated with the population influx focusing on problems without solutions reduces motivation for improvements and wastes resources.

The major environmental issues identified are:

- Cooking fuel
- Erosion and Landslips
- Water and Sanitation
- Solid Waste Management
- Human Wildlife conflict.

The key points of each of these issues are outlined below along with current actions taken to address the issue both within the PMO and amongst the broader response actors. Recommendations are given for actions in both the short and long term to improve the environmental outcomes in these situations.

Cooking Fuel

Assessment

The camp population has not been provided with cooking fuel. The majority of camp population uses firewood to cook with which is collected from surrounding woodland. Significant unpublished studies into the energy requirements of the camp population were undertaken by FAO, UNHCR and WFP as part of the SAFE (Safe Access to Fuel and Energy) initiative. These studies found that most of the firewood used in the camp is purchased from firewood suppliers from both within and outside the camp population and some local communities are charging for access to the forest areas. The cost of cooking fuel is causing families to miss meals and exchange food rations for cooking fuel. Collection of firewood is beginning to cause conflict with the local population and is seen as a protection issue particularly to women and girls.

The FAO study indicates that between three and five football fields are being cleared every day for collection of firewood. This is rate of clearance is unsustainable in the forest areas surrounding the camp. The UNHCR study indicated that there is insufficient land available to initiate sustainable forestry firewood supply and improved cook stoves and other technologies such as cook bags will not reduce firewood use to sustainable levels. Compressed rice husk briquettes and other biomass based solutions cannot be supplied in great enough numbers to meet demand of the camp.

Food is generally cooked inside shelters on home built clay stoves. This is inefficient and creates major air quality issues within the shelters which impact women and children more directly. In the evenings when cooking fires are being used there is a significant drop in air quality across the camp.

Collection of firewood has a significant impact on the broader environment, extending the impact of the camp well beyond its borders. The firewood collection significant clears surrounding land of all vegetation from standing trees to small bushes which negatively impacts local fauna including elephants and increases the likelihood of conflict between elephants and camp populations. Vegetation removal has the additional impact of increasing the likelihood of landslips and erosion in the surrounding hills. The increased erosion may negatively impact crops of host community during periods of high rainfall. In addition firewood collection increases the likelihood of conflict with the host community which also relies on the woodlands for their own cooking needs. It should be noted that the forest reserves were overexploited and significantly degraded before the influx of people from Rakhine State.

Current Actions

UNHCR and IOM have agreed a plan to distribute LPG to all camp inhabitants. Gas will be supplied by private companies using a voucher system for both initial distribution and refilling of gas. Costs are estimated at USD 50 per household for set up and USD 26 ongoing cost per person per year which equates to USD 130 per household for the first year. These predicted costs are reportedly lower than current costs to families of purchasing firewood. IOM (and UNHCR) are starting a tender process for supply of gas and stoves, which is expected to take at least two months and will target 200,000 households.

The PMO appeal includes supply of improved cook stoves to 20,000 households. It was agreed to amend this to supplying LPG in line with the IOM, UNHCR initiative. The procurement process for LPG bottles and stoves is in its initial stages. Swedish RC has contributed CHF176,000 to the appeal earmarked for stoves. There are currently no plans for education program or any additional work that is likely to be required around provision of LPG.

Recommendations

- Provision of LPG as cooking fuel to camp communities and targeted members of host communities will significantly reduce adverse environmental impact of the camps
- For maximum environmental benefit LPG should be provided to all camp inhabitants closely linked to other agencies and be associated with a ban or restrictions on firewood collection
- Provision of LPG should also include a safety education program to ensure safe and efficient use of the resource, including investigation into shelter design to ensure adequate airflow and prevent build-up of carbon monoxide.
- Stove parts that may wear out and cause heightened risks such as hoses or valves should be freely available

Landslide and Erosion Risk

Assessment

The camp is located in an area of steep, low hills. To make adequate flat space for the shelters cuts were made into the hillsides making earth platforms on which the shelter structures were made. In addition the ground cover and other plant material have been removed, either to make space for the structures and/or to be used as cooking fuel. Other earthworks associated with the camp including the making of roads and walking tracks and compacting of the ground surface will also impact on landslide and erosion risk.

The earthworks and removal of groundcover have greatly increased the likelihood and erosion and the risk of land slumps and landslides. These impacts will be most likely realized during the monsoon season, which runs from April until October each year with rainfall peaking in June and July. Although the clearance of vegetation and ground cover immediately increases surface erosion. Landslide risk may be delayed for up to 2 years as the roots of cleared vegetation may still have a stabilizing effect even after the vegetation is cleared.

The impacts of landslides and slumps will be directly within the camps. Impacts are most likely to be through damage to property and infrastructure, but may also include injury and loss of life. Mass land movement will also increase the rate of erosion.

Erosion is inevitable during the wet season and may become a very significant issue even without landslides. Erosion itself is likely to cause damage to property and infrastructure as well as increasing the risk of landslides. Erosion will also increase the sediment loads in surface and flood waters, decreasing water quality and potentially harming fisheries and increasing flood risk. The increased sediment load is also likely to increase the flood damage to the host community by smothering crops and damaging infrastructure.

Current Actions

The broader response community is strongly aware of the landslide risk associated with the camp with an initial DRR TWG being set up between the Shelter and Site Coordination sectors to coordinate responses. UNHCR has contracted the Asian Disaster Preparedness Center to conduct coarse and fine scale landslide-risk assessment across the whole camp with the first results due at the end of January. In addition FAO has begun work with host communities to respond to changes in croplands caused by the increased erosion.

Recommendations

- Relocation of households from areas of high landslide risk to areas lower risk as identified by the ADPC study should be conducted in association with other agencies
- Additional large scale earthworks to reduce the risk of landslips including drainage and other water management work should be conducted before the onset of the monsoon season
- Planting of ground cover and deep rooted plant species is important to prevent surface erosion and landslides in future years
- Conducting investigations into the possibilities of reducing sediment outflows into waterways and agricultural land during flood periods may reduce the likelihood of negative impacts on the host communities

Water and Sanitation

Assessment

The area of the extended Kutupalong camp has very limited available fresh surface water. All streams and rivers in the area have at least some degree of tidal salt influx. A small number of small to midsized ponds have been created that are used for fish farming. Shallow and deeper tube wells are common in the host community and are used for home supply and crop irrigation.

Due to the limited surface water solutions a large profusion of shallow tube wells and some deeper tube wells were very quickly drilled by many different agencies. It is predicted that during the dry season many shallow tube wells will dry up and no longer be useful. Many emergency latrines of varying quality were built. With the very limited space within the camp latrines and shallow tube wells are in close proximity. A large number of shallow wells show fecal contamination and it is considered likely that this contamination would spread to the majority of shallow wells and possibly also deeper wells.

Deep tube wells and larger production wells are being installed as a mid to long term solution to provide safe drinking water for the camp inhabitants. There are a large number of unknowns about the ground water aquifer including;

- The connection between shallow and deep water aquifers including the impact of deep water extraction on shallow wells and the likelihood of contamination of deep aquifer by surface contamination
- The resilience of the aquifer to water extraction including concerns of salt water intrusion exist, but it is not thought to be likely
- Presence of Arsenic, Fluoride, Iron or other potentially harmful chemicals within different aquifer layers

Current Actions

There is a deadline set by the WaSH sector to cease the construction of emergency latrines by the end of 2017 and pressure to find more sustainable solutions for management of sewage waste. The PMO is also including a specialized team to set up and run a sludge treatment plant to better manage the sanitation situation. The environmental impacts of this treatment plant will also require careful management.

Some limited testing of surface water has been conducted by the Department of Environment. The result of this testing already indicates a decline in water quality that is most likely associate with

surface run of and erosion. The M40 ERU water laboratory and other agencies have completed some testing of water quality, both biological and chemical, but this has not been comprehensive or strategic.

The PMO M40 ERU has begun work on developing a ground water monitoring system. This has involved discussions with the Hydrogeology TWG and the Department of Health Engineering. There is strong enthusiasm for this project and sources of funding need to be found.

Recommendations

- A comprehensive survey of water quality of the current hand pumps and water sources across the camp is required including an investigation of sustainability of shock treatment of contaminated pumps
- A groundwater monitoring plan to assess the changes of water level and detect changes in salinity and contaminants should be set up with a key focus on sustainably monitoring the system and reporting the results
- Education campaigns are required to change the water use habits of the camp population to distinguish between drinking water and water for other uses

Solid waste management

Assessment

Bangladesh and Cox's Bazar has poor waste management systems. There is some limited collection within the city and reportedly some sorting and composting of organic waste. There are no official landfill sights. There is a strong plastic and other recycling industry which is largely demand driven with private collection and recycling of cost effective items such as PET bottles and metals but no recycling or management of items such as plastic bags. Within the camps there is little to no solid waste management. Plastic waste is beginning to build up, this is slower than expected which may be because plastic waste is being used as a cooking fuel.

The PMO has no strategic waste management plans. The warehouse does not have any waste management plan. Warehouse waste is primarily packaging materials from unpacking and re-packing carried out with warehouse and consists largely of plastic sacking and paper products. Waste is disposed of by informal reuse and recycling of desirable items by the host community and open burning of other waste.

The Field Hospital has medical waste incinerators for their own clinical waste and that of mobile and small clinics. Other general waste is collected by outside supplier who takes recyclable items and the rest is burnt in public collection point. There is no planning for 'end-of-life' processing of distributed items such as plastic sheeting or bedding materials.

Current Actions

The WaSH coordination group has decided to not focus on waste management until 2018**.** UNDP has deployed a waste management specialist, provided by MSB, who will work across both the emergency situation and the greater Cox's Bazar region. Currently a pilot study has been started as collaboration between UNDP, WFP, IOM and BRAC to give basic and immediate support for solid waste management to the camp and host communities in Leda.

The PMO response currently has no waste management plan either for its own work or for the broader camp situation. The MSM20 ERU had developed a limited number of waste pits in the camp

and was providing education on separating biodegradable and non-biodegradable waste. In addition the Danish RC was beginning to look for solutions for waste management.

Recommendations

- Develop a waste management plan for all waste generated by the PMO operations including ERU operations taking into account the limited facilities within the Cox's Bazar district
- Work with UNDP waste specialist and Cox's Bazar civil systems to develop waste management solutions for the camps including recycling of plastic products
- Investigate the possible synergies of combining in camp waste management activities with cash for work programs
- Develop end-of-life/life cycle plans for all items, and packaging, purchased and imported as part of an emergency response
- Develop minimum standards for waste management for warehouse operations

Human Wildlife Conflict

Assessment

The Kutupalong Extension is within wildlife management areas and as such raises the potential for conflict between camp inhabitants and wildlife. The camp is also built across a traditional elephant migration route and there is a history of conflict between the local population and elephants. On average of 10 – 12 people are killed by elephants in Cox's Bazar region each year without the added influx of people from Rakhine State. There have been multiple incidents of physical conflict between camp inhabitants and elephants resulting in human deaths and injuries and damage to shelters and personal property. Elephants are water limited so conflict is may increase during dry periods.

Current Actions

UNHCR have contracted IUCN to conduct community education on responding correctly to the presence of elephants and to investigate options for deploying elephant deterrents. The DRR TWG proposed to move people away from known migration routes; however, this seems impractical as the cleared routes will be very narrow.

The PMO currently has not programs related to human wildlife conflict.

Recommendations

- Provide training to key members of PMO staff to better understand how to best react to wild elephant encounters

Other issues

Bamboo Use

The shelter material provided to the people from Rakhine State included bamboo for the frame of the structure. The bamboo is harvested from plantations and wild areas from within Bangladesh and transported to Cox's Bazar by local suppliers and was purchased on site by shelter teams. Before the influx Bangladesh's use of bamboo exceeded its supply by an estimated 110%. This over-exploitation will have been exaggerated by the demand from the response. The bamboo was not treated before distribution to the camp community. Treatment can extend the useful life of the bamboo.

Although the use of bamboo is exacerbating the over exploitation of Bangladesh's bamboo forests there are few options available to replace bamboo. The increase demand of bamboo is likely to increase the price and therefore lower the overall demand within Bangladesh.

Closure and Restoration

The development of the camp, particularly the clearance of vegetation and earthworks, has had an immediate and ongoing negative environmental impact on the immediate and broader site. Once the camp closes, whenever that may be, it is important to have strong plans to clear and restore the sites. Restoration plans should include consultation with host communities and government agencies as well as making use of environmental expertise to identify appropriate tree species

Recommendations

- Monitor the price and supply of bamboo to ensure price spikes do not adversely impact response operations
- Investigate the efficacy of pre-treating bamboo before distribution
- Plan for contribution to restoration efforts
- Ensure restoration plans fit with government plans, have community support and are ecologically sound

Assessment of Deployment

The short term deployment of an Environmental Specialist is relatively novel for a RCRC operation. The duel objective of collecting information for a broad assessment of environmental impacts while also looking to institute real time changes in the ongoing program is challenging, but potentially successful.

An alternative approach is to conduct a more comprehensive Rapid Environmental Assessment. In this response an REA was conducted by the UNDP. The formality of conducting an assessment and completing a report, even a rapid assessment, tends to encourage delays in action and promotion of generalized, non-specific recommendations which are easily ignored. As of the end of January the results of the UNDP REA are yet to be formally released despite being effectively completed by the end of November.

A one month deployment during the third month of the response is useful for identifying the important environmental issues. However, it does not allow enough time to institute projects to reduce the impact. An earlier deployment may also allow for the prevention of some negative environmental impacts through interventions before projects are begun e.g. in the case of land clearance for shelter construction. It is important that real time interventions must be practical and achievable within realistic timeframes not general and open ended.

It was notable in observing the deployment and work of the UNHCR energy and environmental specialists that they had a clear advantage in being experienced within the UNHCR system. This allowed them to more efficiently and effectively work within the UNHCR system and more quickly institute projects and initiatives.

There is a clear advantage to conducting environmental reviews in real time. This ensures that appropriate information and data can be collected and retained as it was found when conducting a

post hoc assessment of the RCRC EVD operation in Sierra Leone that such information is quickly lost or difficult to obtain once the operation has ceased.

Recommendations

- Deployment of an environmental specialist with RCRC operations can achieve significant environmental gains both in the ongoing operation and identifying issues for future improvement
- A one month deployment allows for the collection of information and the identification of key issues however it does not allow time for interventions to be instituted
- Deployment of an experienced environmental specialist with a strong understanding of RCRC systems allows for efficiency in identifying issues and instituting solutions in time limited situations

Conclusion

The deployment of an environmental specialist as part of an IFRC response has the potential to improve the environmental outcomes of both the immediate and future response. The earlier and longer the deployment within the response and the more experienced the specialist the greater the benefits that are likely to be realised.

The five key environmental issues identified were cooking fuel, erosion and landslips, water and sanitation, solid waste management and human wildlife conflict. Recommendations for ameliorating these impacts have been given above. The greatest impact is likely to be the collection of firewood as cooking fuel by the camp inhabitants. Therefore the single greatest action to reduce the environmental impacts of the PMO is the provision of LPG cook stoves in association. This action will have the greatest impact if conducted in association with IOM and UNHCR and includes restrictions on gathering of firewood.

The issue of second greatest concern is the long term provision of water to the camp through accessing groundwater. There are a large number of unknowns surrounding the extraction of ground water on the site. Establishing a groundwater monitoring system and agreeing to a long term monitoring and reporting plan will give greater opportunity to sustainably manage this vital resource.

There is an unusually large amount of interest in the environmental impacts of this emergency from humanitarian actors. As such the opportunity should be taken to partner with and support other activities being taken in relation to erosion and landslips, solid waste management and human wildlife conflict. Continued participation with the Environment TWG will allow the PMO response to leverage of these activities to achieve greater benefit for the people from Rakhine state.