Project Completion Evaluation of Disaster Resilient City Development Strategies for Sri Lankan Cities Phase I & II (2011-2014)

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ABBREVIATIONS

AGA	Assistant Government Agent
AMC	Akkaraipattu Municipal Council
BMC	Batticaloa Municipal Council
BUC	Balangoda Urban Council
CBO	Community Based Organisation
CEA	Central Environment Authority
CEB	Ceylon Electricity Board
CCD	Department of Coast Conservation
CDPC	City Disaster Preparedness Committees
DAC	Development Assistance Committee
DMC	Disaster Management Centre
DMU	Disaster management Unit
DRR	Disaster Risk Reduction
DRR&P	Disaster Risk Reduction and Preparedness
DRTs	Disaster Response Teams
DS	Divisional Secretary
DS Office	Divisional Secretariat Office
DSD	Divisional Secretariat Division
DWLC	Department of Wildlife Conservation
FAR	Floor Area Ratio
FGD	Focus Group Discussions
GIS	Geographic information Sysyem
GN	Grama Niladhari
GND	Grama Niladhari Division
ICTAD	Institute for Construction Training and Development
IDPs	Internally Displaced Persons
KMC	Kalmunai Municipal Council
LA	Local Authority
MaRGG	Management and Resources for Good Governance
MOH	Medical Officers of Health Unit
MPS	Maritimepattu Pradeshiya Sabha
MC	Municipal Council
MUC	Mannar Urban Council
NBRO	National Building Research Organisation
NGO	Non-Governmental Organisation
PHI	Public Health Inspector
PWG	Planning Working Groups
RDA	Road Development Authority
RDS	Rural Development Societies
RMC	Ratnapura Municipal Council
SLILG	Sri Lankan Institute of Local Governance
SWOT	Strengths, Weaknesses, opportunities and Threats
TOR	Terms of Reference
UDA	Urban Development Authority
UOM	University of Moratuwa
VUC	Vavuniya Urban Council

EXECUTIVE SUMMARY

Urban Development Authority (UDA) is the national body that has legal authority to prepare, gazette, implement and monitor the Development Plans in areas declared by the UDA under section 8(A) of the UDA Act. However, not all urban areas declared by the UDA have Development Plans due to resource constraints. Moreover comprehensive Disaster Risk Reduction and Preparedness Plans (DRR&P) have not been incorporated to Development Plans prior to this Project intervention.

UN-Habitat, with the financial assistance of AUSAID stepped in, to bridge this gap by implementing the Project 'Disaster Resilient City Development Strategies for Sri Lanka'. It has been appropriately tailored to the local needs of the beneficiary communities addressing the large implementation gaps that existed in the programmes implemented with state patronage due to capacity constraints in technical knowledge and funding in the Local Authorities. The Local Authorities hitherto paid attention only to disaster relief and rescue operations and not to improving disaster resilience. As a result majority of the communities trained by the Project attributed their capacities in facing challenges in relation to disasters, to the Project.

UN-Habitat and its Partner Organizations have built strong relationships with the Local Authorities and the communities in the Project areas, which have helped in enhancing efficiency of implementation by reducing the bottlenecks that existed in state mechanisms. These partnerships have made it possible to jointly work for greater synergy in responding to a vital need; sustainable and resilient cities where the communities have the ability to adapt to disasters and respond quickly.

This was the first time a participatory approach was adopted in the history of Urban Development Authority to obtain information required to prepare Development Plans. As a result the UDA was able to capture the critical needs of the local communities with regard to disaster risk reduction, bridging the gaps hitherto existed between the Local Authorities and the communities they serve.

Preparation of DRR&P Plans was a comprehensive step by step process. Internationally recognized conceptual frameworks adapted to Sri Lankan context were used in developing a solid platform to create resilient cities. The Project engaged local communities and officials working at grassroots level to generate information required for hazard, vulnerability risk and capacity assessments. Hazard mapping involving the community, Grama Niladharis (GNs) and the UDA officers coupled with field visits for validation helped to generate evidence based information on disaster prone areas. Vulnerability of the community was assessed in terms of social, economic and environmental dimensions and mapped to produce visual illustrations. Together with the technical input from the Partner Organisations, composite risk maps for floods, drought, landslides, sea level rise, cyclone, Tsunami, and strong wind were prepared as applicable and combined to develop the Multiple Hazard Risk Maps for each location. In *Phase II* the Project went a step ahead to identify very high risk locations where DRR solutions should be focused on. The Project also introduced Building Guidelines incorporating DRR elements.

SWOT analysis was carried out to identify the Strengths, Weaknesses, Opportunities and Threats in each Project location. It enabled building on strengths already existing in the Local Authority areas. Analysis of core problems helped to identify key issues facing the towns and find solutions to resolve such issues. These findings paved way to formulate strategic directions that aimed to improve economic, social and environmental stability by introducing development initiatives

incorporating disaster risk reduction and community empowerment to hold service providers accountable. The strategic directions laid the foundation to identify Action Projects that minimise disaster risks and improve the adaptive capacity of the community to achieve sustainable resilient towns.

The Action Projects identified were prioritized in consultation with members of the public, Planning Working Group (PWG), Government leaders and the other interested groups after field visits were made to observe and verify the projects sites. Thereafter the DRR&P Plans including the Action Projects were forwarded to UDA to be incorporated in the Development Plans to facilitate building sustainable resilient cities.

The *Phase I* locations Blangoda UC, Batticaloa and Kalmunai MCs did not have Development Plans at the time the Project commenced. UDA prepared the Development Plans for these towns with the input from the Project, incorporating DRR&P components. Ratnapura MC had a gazetted Development Plan. UDA amended the Plan and incorporated DRR&P guidelines and relevant Strategic Directions with Action Projects for proper management of land use from a DRR perspective.

The UDA declared areas Akkaripattu MC, Mannar UC and Maritimepattu PS have no Gazetted Development Plans. The planning process of these three towns was initiated after the Project commenced preparation of DRR&P Plans in the *Phase II* of the Project. UDA is in the process of drafting the Development Plans of these towns incorporating DRR features detailed in the DRR&P Plans. In the case of Vavuniya UC, the gazetted Development Plan was amended by incorporating DRR&P features proposed by the Project.

However, in the case of Balangoda UC and the Ratnapura MC, incorporation of DRR&P Plan to the Development Plan seems inadequate and inconsistent. Not all Action Projects have been incorporated to the Development Plans. The project may communicate this fact to the UDA as unless and until they are incorporated it is not likely to sustain.

Further the Project has prepared a comprehensive set of planning and building guidelines for disaster risk reduction covering all features of buildings. However due to inadequate specifications and quantification UDA was unable to incorporate some of the important guidelines. More interaction and consultations between Project Partners may have helped in preventing such issues.

Notwithstanding it is noteworthy that the training programmes conducted by the Project on preparation of Development Plans have triggered acceleration of Development Plan preparation process in 36 UDA declared areas that need to build resilient cities. This is in addition to the eight (8) towns identified by the Project.

Institutional strengthening of Local Authorities from a DRR perspective was visible since commencement of the intervention and can be considered as a major achievement of the Project. The Local Authorities gave special focus to disaster risk reduction and preparedness. DRR units were established in many Project locations. Council decisions were taken to introduce new budget lines whilst others made additional funding allocations in their budgets to facilitate implementation of DRR&P Plans. City Disaster Preparedness Committees (CDPCs) were established to provide technical input in *Phase I* Project locations whilst collaboration with the Technical Working Groups of the Disaster Management Units (DMUs) improved in *Phase II* locations. The Local Authorities attributed improved collaboration with other agencies to the Project as earlier different agencies acted upon their own mandates during disasters.

However the DRR units established as a result of the Project are more involved in disaster relief and rescue operations yet. Institutional strengthening of the DRR units is needed if they are to take proactive action in disaster risk reduction and prevention work. On the other hand, if the Action Projects identified in the DRR&P Plans are to be implemented, more aggressive funding strategies are needed.

The CDPCs and the Technical Working Groups formed by Disaster Management Units guided the communities in disaster preparedness and coordination of relief and rescue operations during the disasters. However activities by these technical teams under both *Phases I and II* by and large seem to take a reactive approach. Hence more emphasis on disaster risk reduction and preparedness is needed if the primary Project goal of building sustainable resilient cities is to be achieved. Formulation of systematic work plans and Terms of Reference pinning down responsibility on each member of these technical teams needs attention if this endeavor is to be achieved. However it will take a longer duration than anticipated by the Project as it takes time to bring about attitudinal changes of the political authorities, officials as well as the communities.

The Project recognized the need to strengthen disaster risks and resilient capacities of the local communities including women. The communities that actively participate in managing disaster risks and disasters generally have an edge over others to face challenges posed by disasters. Under *Phase I,* the Project established community based Disaster Response Teams, a well-structured institutional arrangement to enhance the resilient capacities of the local communities. The Project may encourage the *Phase II* cities to adopt this concept, scale-up and replicated as smaller committees are more manageable and the entire risk areas could be covered.

The Project also setup Rapid Response Teams (RRTs) consisting of youth, of both genders under *Phase I*. A five day adventure based residential training programme was conducted to enhance their ability to overcome challenges, and respond quickly and correctly. In *Phase II* of the Project, training was concentrated on GND level Disaster Management Committees setup by the DMUs. The collective effort made to achieve a common goal without reinventing the wheel can be recognized as a good practice as the benefits of improved resilience capacity will accrue to a much larger segment of the community. The participants, Local Authorities, DMUs and the Lane Committee members were highly appreciative as they would have not been able to organize a training programme of this nature if not for the Project, due to resource constraints.

However when considering disaster prone areas in the Project locations, the RRT numbers trained was considered insufficient. So far even the Lane Committees have been formed relatively in a few villages. In any event it would have been difficult to cover all risk and high risk areas in comparatively a short Project period. Despite trainers from each village have been trained it is not known whether the Local Authorities have sufficient resources to mobilise teams as in the case of experienced training institutes. On the other hand, unless the trained committee members are linked to other village activities there is a risk of the committees going into dormancy and dying a natural death.

The school-based awareness creation under *Phase II* was an ambitious programme that took a new turn when the Project assured funds to implement the award winning project proposal to resolve DRR related issues in the locality, instead of the traditional awareness building programmes. The concept was well appreciated increasing the expectations of both the school

children and the affected communities. However it could not be implemented prior to Project Exit due to procedural bottlenecks in disbursement of funds and inclement weather conditions. Future Projects may give due consideration to such issues prior to embarking on programmes of this nature. Despite DRR items were donated to the schools, it left the school children and the vulnerable communities disappointed as the selected Projects could not be implemented.

The DRR&P Plans have proposed Action Projects to establish community disaster funds, insurance schemes etc. at local level. However feasibility of such mechanisms needs to be studied further as it is not known how many families can withstand the strain of the financial burdens attached to such schemes. In any event the Local Authorities need to make the public well aware of the advantages and the disadvantages in advance of implementation of the plans.

The Project had supplied DRR equipment to the community without consultation and consensus of the Local Authorities hence was unable to trace as there was no inventory. Had they been given in concurrence with the Local Authorities there would have been greater ownership of the items whilst pinning down responsibility on the Local Authorities to replace or repair the items when required. Also whenever the need arises the items could have been shared accruing the benefits of the limited resources to a larger segment of the community.

Prior to commencement of the Project the Local Authorities and other relevant institutions more often than not worked independently with separate mandates in disaster response and relief operations. Now the collaboration among institutions, particularly the Local Authorities and the DS Office has improved to a great extent. The Local Authorities in all Project locations except Mannar attributed improved collaboration among institutions to the Project, a positive impact of the Project. However it will take a much longer duration to change the mindset of the political leadership in Mannar.

In terms of environmental perspective, the Action Projects defined in all DRR&P Plans, in general are observed to be sustainable within the context of existing environmental settings. The mitigations in the Action Projects deliver positive changes, which are bearable in terms of both spatial and temporal dimensions of relevant environment. The expected changes are ecologically sound cost effective and socially acceptable. Nevertheless, the close review of findings indicate that the potential impacts of overall DRR&P Plan upon local-regional environs required scrutiny and further mitigated as necessary to ensure the environmental sustainability.

Notwithstanding the gaps the foundation has been laid down by the Project to achieve its primary goal; ‘establishment of sustainable disaster resilient cities’ due to the high quality comprehensive set of DRR&P Plans that include Strategic Directions and Action Projects that could be made used of to raise funds for implementation.

1.0 INTRODUCTION

1.1 Country Context

With rapid urbanization, majority of Sri Lanka's projected 22million population is expected to be living in urban areas by 2020[1]. Around 70% of this population and 80% of national economic infrastructure is concentrated along coastal cities and disaster prone hilly areas highly vulnerable to disasters and climate changes. This will negatively impact on human settlements, city productivity and service delivery especially to the low income groups.

State mechanisms have been established since the enactment of Sri Lanka Disaster Management Act No.13 of 2005 which provides the legal basis for instituting a disaster risk management system in the country. In December 2005 a separate Ministry for Disaster Management had been established. Thereafter the Disaster Management Centre (DMC) had been established for the purpose of planning, coordinating and implementing of natural and other forms of disasters. Some of the principle functions of the DMC under the said Act are preparation of the National Disaster Management Plan and the National Emergency Operation Plan, issuing instructions and guidelines to appropriate organizations, non-governmental organizations, district secretaries and divisional secretaries on activities relating to disaster management and initiating and implementing work programmes in co-ordination with such organizations and coordinating awareness programs on natural disasters and man-made disasters[2].

Despite these developments, state mechanisms particularly at Local Government levels have taken a more reactive approach. Their focus was more on post disaster emergency response, rescue activities, relief work and evacuation of the affected. Their Roles in disaster management are not well defined. No budgetary provision had been made for DRR purposes which imply the absence of DRR initiatives in regulations, land use plans and Development Plans. Further, the institutional structures in the Local Authorities; Municipal Councils and Urban Councils in Sri Lanka are weak with archaic management systems hence contributed to poor response to disasters. The situation is aggravated by the scarcity in human resources with professional skills and competencies to secure the advantages of improved technology in relation to DRR. The awareness building of the communities in disaster preparedness has also been low resulting in poor response capacity at the community. Another contributory factor is dependency on perceived benefits from disaster relief.

There has been an increase in frequency of natural disasters in the recent past. The low income groups in the disaster prone provinces have been the most vulnerable to natural disasters and suffer from economic shock, illnesses, loss of life and assets hence disasters have been considered as a threat to achievement of the *Millennium Development Goal 1: Eradicate Extreme Poverty and Hunger.*

There is evidence that mainstreaming Disaster Resilient Strategies in city development can reduce the impact of disasters. United Nations Human Settlements Programme, UN-Habitat Sri Lanka responded to this situation with the funding support from AUSAID by implementing the Project 'Disaster Resilient City Development Strategies for Sri Lankan Cities' to establish sustainable disaster resilient and healthy cities and townships in disaster prone regions of Sri Lanka.

[1] Disaster Resilient City development Strategies for Sri Lanka Cities Project Document
[2] http://www.dmc.gov.lk/index_english.htm#

The Project embarked on preparation of strategic plans that deliver disaster risk reduction strategies in the Project locations with the objective of improving disaster resilience where communities have the ability to adapt to disasters and respond for quick recovery. From inception, implementation took a participatory approach with multiple stakeholders namely, vulnerable communities, Government agencies and other Partner Organisations contributing to produce Disaster Risk Reduction and Preparedness (DRR&P) plans. The Project also developed Action Projects incorporating Land use or City Development Plans incorporating DRR elements. Prioritised Selected Action Projects in the DRR&P Plan were implemented in each Local Authority area. Local Authority based Disaster Response Teams also were established. The DRR&P Plans were used by the UDA, in preparation of Development Plans aligned to Land use Plans and City Development Plans.

AUSAID provided the financial support and UN-Habitat Sri Lanka was involved in mobilization and implementation of the Project. The Key Project Partner Organisations and their roles were as follows:
Urban Development Authority (UDA) – Planning Support
Disaster Management Centre (DMC) – Technical Support
Local Authorities (LAs) – Project implementation
University of Moratuwa (UOM) – Technical support
SRI Lanka Institute of Local Governance (SLILG) - Project Implementation and Capacity Building
Institute for Construction Training and Development (ICTAD)
- Project Implementation and Capacity Building
National Building Research Organisation (NBRO) - Project Implementation and Capacity Building
Management and Resources for Good Governance (MaRGG) – Capacity Building

1.2 Context in which the Programme Operated

The primary Goal of the project was to establish sustainable disaster resilient and healthy cities and townships in disaster prone regions in Sri Lanka.

The main outputs were as follows:[3]

- Formulation of Disaster Risk Reduction and Preparedness Plans for the selected Local Authorities (LAs) that are aligned to those City Land use Plans and City Development Plans that have also been revised and updated through this project;
- Introducing Disaster Risk Reduction (DRR) into the building guidelines based on DRR risk assessments;
- Establishing City Disaster Preparedness Committees (CDPC) and Community-based Disaster Response Teams ensuring women's representation; and
- Implementing Disaster Mitigation Pilot Projects with a scope of city-wide upscaling under the city development plans

The Ranking based on the Millennium Development Goals:[4]
Goal 7: Environmental Sustainability 70%
Goal 1: Eradicate Extreme Poverty and Hunger 20%
Goal 3: Promote Gender Equity and Empower Women 10%

The Project was implemented under two phases. The *Phase I* of the Project began in end 2011 with a financial capital of Australian Dollars 1,100,000/- from the Government of Australia to strengthen Local Authorities and enhance infrastructure in two cities in the Eastern Province and two in the Sabaragamuwa Province.

[3] Project Completion Evaluation TOR
[4] UN-Habitat Project Proposal

Thereafter in 2013, the Project expanded to four more cities; three in the Northern Province and one in the Eastern Province under *Phase II* with a further financial capital of Australian Dollars 1,100,000/- also from the Government of Australia to improve disaster risk reduction and preparedness. Under this phase the projects aim was to replicate and scale-up the outputs and results of the *Phase I*; integration of DRR and urban planning process with a special focus on the housing sector and also emphasize institutionalization of the DRR aspects in housing construction.

Traditionally, disaster management in Sri Lanka is focused on centralized emergency responses. This Project shifted the focus and emphasized on strengthening the capacities of the communities in the disaster prone areas to adapt to the disaster and mitigate the risks to the extent possible.

1.3 Geographical Coverage of the Project

There are many Cities in Sri Lanka that needed DRR programmes. However due to resource constraints, UN-Habitat considered the following factors in selecting the eight Local Authorities for Project implementation:

- Adverse socio-economic impact from displacement, loss of livelihoods and loss of lives caused by multiple disasters and predicted climate change impacts; frequent floods, sea level rise, cyclones, lightning strikes and the effects of 2004 Tsunami in the Eastern Province
- Effects of floods and earth slips in the Sabaragamuwa Province
- Country wide disaster vulnerability and urban development data available with the DMC and the UDA
- Whether lagging Provinces
- Whether UDA declared areas with no Development Plans with DRR features

The following geographical areas were covered under *Phase I* of the Project:

Table 1 **Geographical Coverage of the Project**

Phase I	
Province	**Local Authority**
Eastern	Batticaloa MC – Manmunai North DSD
	Kalmunai MC – Kalmunai Tamil, Kalmunai Muslim and Sainthamaruthu DSDs
Sabaragamuwa	Ratnapura MC area
	Balangoda UC area

Accordingly, Batticaloa and Kalmunai MC areas in the Eastern Province and Ratnapura MC and Balangoda UC areas in the Sabaragamuwa Province, considered to be lagging provinces were selected under *Phase I* of the Project. These towns were declared as urban development areas by the UDA and do not have approved Development and Land use Plans with DRR elements. All are vulnerable to multiple disasters and poorly rated in economic performance, poverty, unemployment and access to basic services.

Since end of the conflict between Sinhala and Tamil groups that lasted for 30 years, the Northern and the Eastern Provinces are undergoing rapid economic and infrastructure development. Majority of the Internally Displaced Persons (IDPs) have returned to their original dwellings and are in the process of rebuilding their houses with Government assistance. The *Phase II* of the Project began in 2013 with a scope to improve Disaster Risk Reduction and preparedness in four cities; Vavuniya, Mullaithivu and Mannar in the Northern Province and

Akkaraipattu in the Eastern Province, integrating DRR and urban planning process with a special focus on the housing sector.

All four cities are affected by multiple disasters floods, droughts, cyclones, high winds and lightning whilst sea level rise and 2004 Tsunami affected the coastal cities Mullaithivu, Mannar and Akkaraipattu. Mannar is also affected by sea erosion.

The following Local authority areas were selected under *Phase II* of the Project:

Table 2 **Geographical Coverage of the Project**	
Phase II	
Province	**Local Authority**
Northern	Vavuniya UC area, parts of 13 other GNDs and PS area
	Mullaitivu/ Maritimepattu PS – 46 GNDs
	Mannar DSD area – Manna UC and Mannar PS
Eastern	Akkaripattu DSD area - 23 GN Divisions of Akkaraipattu Municipal Council and five GNDs from the Pradeshiya Sabha area

1.4 The Rationale for the Evaluation

The rationale for the Evaluation is to analyse and report on the key aspects of the 'Disaster Resilient City Development Strategies for Sri Lankan Cities Project' in relation to the project objectives, key outputs as per the project Log Frame and key factors; Social, Methodology, Environmental, Financial, Institutional and Viability stipulated in the TOR.

1.5 Scope of the Evaluation

The Evaluation focused on the projects implemented in Balangoda, Ratnapura, Batticaloa, and Kalmunai under ***Phase I*** of the Project and Mannar, Vavuniya, Mullaitivu and, Akkaraipattu under ***Phase II***.

It was designed by the Evaluation Team to specifically address the criteria; ***Relevance and Appropriateness, Efficiency, Effectiveness, Impact, Sustainability and Institutional Strengthening and Capacity Enhancements*** in relation to overall goal of the project and main components of the Logical Frame Analysis, which will lay the foundation in defining the approach to the Evaluation.

In addition, the following key factors were evaluated:

Social

- The cultural and social appropriateness of the project and the level of participation of the MCs/ LAs and other implementing partners - Urban Development Authority (UDA), University of Moratuwa (UOM), Disaster Management Centre (DMC), Institute for Construction Training and Development (ICTAD), Management and Resources for Good Governance (MARGG) and Sri Lankan Institute of Local Governance (SLILG)
- Reduction in risk and vulnerability from natural hazards within the MCs/ LAs
- The level of satisfaction of the MCs/ LAs and other stakeholders

Methodology

- The extent of local participation in the process, including the MC/ LA and Technical Working Group members and their views on its effectiveness
- The strengths and weaknesses of the project implementation methodology and how it is perceived by the MCs/ LAs

Environmental

- The impact of the construction process on both the local and regional environment: The environmental impacts were evaluated with respect to the key temporal milestones; the Planning, Implementation as well as Maintenance (and Continuation) phases of the Project. The environmental evaluation covers considerations with regard to environmental regulatory framework, management and conservation elements on the Design and Implementation phases of the Project. The 'Green Audit' approach was followed for the evaluation.

  Effects of Action Project upon the Physical (natural and manmade), Biological (biodiversity and fragile ecosystems etc.) and Social (traditional land uses, regulations and management protocols etc.) elements of the environment were evaluated.

  Both favourable and adverse impacts of the Action Projects during and post construction phases, over the local and regional spatial dimensions as well as long and short term temporal dimensions were considered on expert judgment basis.

Financial

- The payment process for partners; were the funds received on time, was it used for initially intended purpose, were there any balances, the reasons for the balance and how it was reallocated and used

Institutional

- Institutional strengthening of MC/LAs through establishment of CDPCs including the lessons learnt from the programme
- Mobilising and strengthening the capacities of community based Disaster Response Teams (DRT) to adapt to the disaster and mitigate the disaster risks; a Lane Committee for every 150-200 households which encompasses the entire urban population living in the identified disaster prone areas

Visibility

- The levels of awareness amongst beneficiaries regarding the contribution of the funding partner (Government of Australia)

2.0 METHODOLOGY OF CONDUCTING THE EVALUATION

2.1 Approach

A mixed-methods approach was followed in conducting the Evaluation. This includes generation of qualitative primary data using a ***participatory approach,*** as well as collection of and analysis of secondary data available with UN-Habitat, (project statistics and information; project documents, DRR&P Plans, project reports, etc needed to conduct the review), Local authorities, other implementing partners and information sources. A combination of research methodologies/ tools were used for the purpose of ***triangulation of information*** elicited from different sources to strengthen validity and to provide a more comprehensive coverage with in-depth analysis to the extent possible, within the time available.

As stated in the TOR, the evaluation used the development evaluation criteria from the Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and Development; Relevance, Appropriateness, Effectiveness, Efficiency, Impact, Sustainability and Capacity Enhancements as the basis of assessment.

2.2 Development of Tools, Data Collection and Analysis

(i) ***Initial Discussion with UN Habitat Project Management***

Discussions were held with the UN Habitat Project Management to gain a better understanding on the Project and to collect the available information related to the assignment

(ii) ***Literature Review for Secondary information gathering*** by scrutinizing a range of documents and reports; project documents, Log Frames, Progress Reports, Situation Reports including Stakeholder Inventory, Vulnerability and Disaster Risk Assessment Reports, Disaster Risk Reduction and Preparedness Plans of the MCs/ LAs developed by the Project, past and current UDA regulations of each Project area and other applicable regulations, Disaster Risk Reduction introduced to building guidelines under the Project, Project Reports of Disaster Mitigation Pilot Project, Community Based Disaster Management Plan, UN Habitat Website and other relevant information pertaining to efforts made by UN Habitat towards achieving the objectives of the project in the eight project cities

(iii) ***Discussions*** with the Mayors, Municipal Commissioners of the MCs and Chairman of the LAs to gain an understanding on the political commitment for the Project as well as the identified Action Projects. Site visits were made to the Local Authorities in each Project area for interviews and discussions.

(iv) ***In-depth consultations*** with relevant implementing partners; Urban Development Authority (UDA), University of Moratuwa (UOM), Disaster Management Centre (DMC), Divisional Disaster management Units (DMU), Institute for Construction Training and Development (ICTAD), Management and Resources for Good Governance (MaRGG) and Sri Lankan Institute of Local Governance (SLILG) Officials, and UN Habitat Staff involved in implementation of the project to obtain stakeholder insights with regard to the main outputs of the project, main components of the Log Frame, the implementation process and strategies, and identify gaps if any and coherence to accepted land use, city development and environmental guidelines, standards, norms and regulations

In-depth consultations/ key informant interviews with the officers of the Local Authority's Disaster Risk Reduction Units/ technical officers/ groups of officials of the eight MCs/ LAs, relevant officials from the DS office: Site visits were made to elicit information with regard to the main outputs of the project, main components of the Log Frame, the implementation process and strategies, and identify gaps if any, and coherence to accepted land use, city development and environmental guidelines, standards, norms and regulations

In addition, the level of participation of the MCs/ LAs, Efficiency and Effectiveness of Project implementation methodology, impact of the construction process on both the local and regional environment, Sustainability, Institutional Strengthening and Capacity Enhancement in Risk Awareness and Identification, Reduction, Preparedness and Resilience, Financial protection etc. was assessed.

The guided questions were adapted based on the Phase of the Project. An attempt was made to conduct *telephone interviews* with some of the officials not available on site***.***

(v) ***In-depth consultations with City Disaster Preparedness Committees (CDPC)/ DRR Unit and Technical Teams*** of the eight MCs/ LAs were held to elicit information on Appropriateness, Effectiveness and Impact of the Project; their participation in formulation of plans and city development strategies; institutional strengthening and capacity enhancement in risk awareness and identification, reduction, preparedness and disaster resilience attributable to this project and Sustainability.

(vi) ***Focus Group Discussions (FGDs) with Community-based Disaster Response Teams (DRTs)*** including ***Senior Citizens*** in the disaster prone areas in the eight project MC/LAs, to elicit information on Appropriateness, Effectiveness and Impact of the Project on the lives of the communities; their participation in formulation of plans and city development strategies, their capacity enhancement; risk awareness and identification, reduction, preparedness and disaster resilience attributable to this project and Sustainability.

FGD in progress

Structured Formats were designed for ***Participative Ranking;*** a rating system with 1-5 points was used so that the results enabled a comparative analysis, including the reasons for the rating which provides insights on qualitative information. Pre-prepared formats were used to facilitate group consensus on the assessment, reasons and suggestions for improvement. The guided questions were adapted to the relevant Phase of the Project.

Following the rating, the participants were probed to provide reasons for the rating, either positive (+) or negative (-). Recommendations for strengthening the DRTs were also established.

This approach allows quantitative findings to emerge as well as qualitative explanations regarding these findings.

The participants were also requested to assess their own capacities on a Likert scale of 1-5 which would be used as a basis for obtaining reasons for self-assessment by the interviewees and suggestions for improvement.

(vii) ***Observation*** of project outputs

(viii) ***Field surveys*** to Disaster Mitigation Pilot Project (Action Project) implementation sites in each MC/LA for field observations.

(ix) ***Discussions*** with a random sample of beneficiary communities in Disaster Mitigation Pilot Project areas to elicit information and community perceptions on the Appropriateness, Effectiveness and Impact of the Project on their lives

The guided questions/ check list agreed with UN-Habitat, which followed the sequence of the 'logical framework' was adopted to gather information/ data from Stakeholder Consultations and Focus Group Discussions during field work to examine whether the Project objectives have been achieved. The discussion/ interview questions were adapted based on the Project Phase.

2.3 Selection of Respondents for Community Level Data Collection

The sampling strategy used for the Local Authorities followed a uniform approach. A random sample of the beneficiary communities from the Pilot Project areas were selected from the geographical areas covered by the Project in Batticaloa, Ratnapura, Kalmunai and Balangoda under *Phase I* and Mannar, Vavuniya, Mullaitivu and, Akkaraipattu under *Phase II*, as applicable, to elicit information/ perceptions on the key aspects of the programme in relation to the project objectives and key outputs as per the project Log Frame and key factors mentioned under *Section 1.5* of this Report, *'Scope of the Evaluation'*. An attempt was made to consider Gender representation to the extent possible in the sample selected for interaction.

The Overall Sample of Selected Stakeholder Categories appears in the table below:

Table 3	**Overall Sample of Selected Stakeholder Categories**								
Description	**No. of Participants**								
	Phase I				**Phase II**				
	BUC	**RMC**	**BMC**	**KMC**	**MUC**	**VUC**	**MPS**	**AMC**	**Total**
FGDs with Beneficiary Communities: Lane Committees/ DRTs/	9	8	9	6	12	8	-	17	**69**
Discussions with School Children	-	-	-	-	7	4	-	-	**11**
Discussions with Community in Pilot Project areas	8	5	1	1	7	3	12	6	**43**
In-depth Consultations with LA/ CDPC/ Other Officials	10	8	8	2	7	12	12	3	**62**
In-depth Consultations with Implementing Partners	-	-	-	-	-	-	-	-	**21**
Overall sample of selected stakeholder categories	***27***	***21***	***18***	***9***	***33***	***27***	***24***	***26***	***206***

The total sample participated in the Evaluation were 206; 69 from Lane Committees in FGDs, 11 school children in Discussions, 43 community members from Pilot Project areas in Discussions, 62 Officials from LA/ CDPC/ Other Institutions in In-depth Consultations, 21 Officials from Implementing partner Organisations in In-depth Consultations.

The members of the Lane Committees and the Rapid Response Teams expressed that the participatory methodology used in conducting the Evaluation to ascertain their views was useful as it provided opportunity to make self-assessments of the work carried out by them and reflect on the changes made due to the project.

2.4 Limitations

The unpredictable political environment prevailing in the country preceding the Presidential elections held early January 2015 and the adverse environment expected thereafter as well as the inclement weather pattern were limitations that resulted in delays in carrying out the fieldwork and reporting.

Some of the information sources particularly in the Local Authorities and other Government Institutions had been transferred to other locations. Some were indisposed due to other commitments on scheduled dates hence were not available to make their observations.

3.0 EVALUATION FINDINGS

3.1 Relevance

3.1.1 Relevance of the Project to Local Context

Sabaragamuwa, Eastern and the Northern Provinces are considered to be lagging provinces. All eight selected Local Authorities in Balangoda, Ratnapura, Batticaloa, Kalmunai under *Phase I* and Vavuniya, Mullaitivu, Mannar, and Akkaraipattu under *Phase II* are vulnerable to multiple disasters. They were declared as urban development areas by the Urban Development Authority implying potential for Government Policy that supports urban growth. Except for Ratnapura and Vavuniya other six towns did not have approved Development and Land use Plans. They too did not have DRR elements incorporated to the plans.

Phase I

Balangoda UC

Balangoda Urban Council (BUC) area has been declared as an urban development area by the UDA although it did not have an approved Development Plan. It is growing in terms of urbanization. According to the National Physical Planning Policy and Plan of Sri Lanka (2011-2030), Balangoda UC is identified within the *Proposed Protected Area Network* as it is located within the Central Fragile Area. It is identified as the second capital city of Ratnapura District and classified as a third order town by the UDA.

The town is affected by major disasters, floods and landslides and minor disasters high winds, lightning and drought. Unstable, steep slopes and fragile geological formation make the area prone to wide range of geological and hydro meteorological disasters. Dorawela Oya, a stream flows through the town increasing the vulnerability to floods. The problem has been aggravated by encroachment of marginal lands and unauthorized constructions resulting in missing links in the drainage network and absence of drainage in some of the disaster prone areas.

Land clearing for construction and agriculture activities such as tea cultivation on sloped and mountainous terrain has increased the risk of landslides. It has a significant socio-economic impact causing damages to the infrastructure and loss of lives. The floods have caused disruption to livelihood activities, loss of livestock, crops and property partly due to the lack of infrastructure facilities to face a disaster.

Ratnapura MC

Ratnapura Municipal Council (RMC) area has been declared as an urban development area by the UDA since 1979. Its Development Plan was gazetted in 2007. However DRR features incorporated to the plan was insufficient. Therefore the need arose to amend the plan to incorporate DRR elements.

Though Sabaragamuwa is a lagging province, Ratnapura is the first order town in the Province and the main regional centre regionally and locally. It is located in the river basin of one of the major rivers in Sri Lanka, Kalu Ganga which is well known for large deposits of precious stones. A high volume of water comes to the basin from upper catchment area. Therefore though the town area is affected by the same disasters as Balangoda, the intensity of disasters is much greater in Ratnapura. The major disasters affecting the MC area are floods and landslides whilst the minor disasters are high winds, lightning and droughts. The town was relocated in a less vulnerable area due to frequent flooding. Essential services also were shifted to the new location.

However, due to the encroachment and unauthorized constructions on marginal lands and disaster prone areas, inadequate drainage facilities with missing links, blocking of drainage due to garbage dumping and inadequate maintenance of drainage, the flooding has aggravated further. Collapsing of abandoned gem mines during rainy season which are left open is an added peril in Ratnapura. It has become a root cause of epidemics such as dengue. Landslides due to land clearing for unauthorized constructions on sloped and hilly land are also a common problem in the area. These issues have caused damages to the infrastructure, disruption to livelihoods and at times resulted in loss of lives.

The income profile in RMC area spans from the highest levels of gem merchants to the lowest levels of farmers and unskilled labourers. Hence there is a disparity in income distribution and the majority who are in the lower income brackets do not have the ability to face and manage disasters due to poor economic and social empowerment.

Batticaloa MC

Batticaloa Municipal Council (BMC) area has been declared as an Urban Development Area of UDA by gazette no.24/3 dated 20. 02. 1979. However it did not have an approved Development Plan.

The major disasters in BMC area are floods, Tsunami, sea level rise and cyclones. Though Eastern Province is a lagging province BMC is growing in terms of urbanization. BMC is identified as a Metro City in the Eastern Metro Region with a one million population by the National Physical Planning Policy and Plan of 2030.

Frequent floods in the area often disrupt livelihood activities of the deprived who are not in a position to face disasters due to poor economic and social empowerment. Common causes for floods have been encroachment of marginal lands, water bodies and thorna, unauthorized constructions and excavations coupled with improper drainage systems. However internal roads constructed by Government sponsored programmes at a higher elevation than the ground level without provision for drainage systems have caused major issues during the rainy season as no outlets have been provided for the flood waters to recede even after the rains have ceased.

Kalmunai MC

Kalmunai Municipal Council (KMC) area had been declared as an Urban Development Area of UDA by gazette notification no.1081/17 dated 26. 05. 1979. Nevertheless it did not have an approved Development Plan.

Although KMC is also situated in the lagging Eastern Province, it is growing in terms of urbanization. It has been identified as a Trade town and as a third order town in the Eastern Province, by the National Physical Planning Policy and Plan of 2030.

KMC records the second highest population density in the country. The city is affected by the major disasters Tsunami, floods and cyclone and minor disasters thunder, drought and sea erosion. Many a time disasters have caused disruption of livelihoods, displacement as well as loss of lives.

Similar to Batticaloa, in Kalmunai also floods are caused due to encroachment of marginal lands, water bodies and thorna, unauthorized constructions and excavations due to lack of knowledge or disregarding building regulations, improper drainage systems and missing links in drainage. Government sponsored internal road construction at a higher elevation than the ground level in areas prone to floods without provision for drainage is an emerging issue as there is stagnation

of water even after the rains have ceased. As the rains continue for about 5 months from November to March the following year the children are unable to go to school. The victims are evacuated to schools and multi-purpose buildings. Stagnant water in ponds due to non-availability of a channel is also another issue faced by the community.

Phase II

Akkaripattu DSD

The UDA declared area of Akkaraipattu consist of 23 GNDs in the Municipal Council Area and 5 GNDs of Pradeshiya Sabha area based on the provisions given in section 3 of UDA Law No. 41 of 1978. Akkaraipattu Municipal Council (AMC) was declared by the gazette notification bearing no.1687/30 dated 6th January 2011 and Akkaraipattu Pradeshiya Sabha by the gazette notification no.1399/16 dated 30th June 2005. The total area has been covered by the Project.

It is a lagging area, however growing in terms of urbanization. Based on the National Physical Planning Policy and Plan of Sri Lanka (2011-2030), AMC is identified as a third order city. AMC did not have an approved Development Plan for MC area or PS area.

The city is affected by the major disasters floods, drought and cyclone. Fire due to electrical faults, human elephant conflict and Tsunami were the other perils of the community though not very frequent. Disasters have caused disruption to livelihoods, property and commerce and sometimes loss of human lives. The floods and drought were the most frequent of the disasters. Floods are caused by insufficient drains and culverts. Roads have been built without provision for drains. As a result water stagnates on the road and the roads are damaged. Another common cause is improper garbage disposal; often garbage is dumped in drains.

Vavuniya UDA area

Vavuniya Urban Council area, parts of 13 other GNDs and Pradeshiya Sabha area were declared as an Urban Development Area by the Gazette notification bearing No.38/16 dated 1st June 1979, based on the provisions given in section 3 of UDA Law no. 41 of 1978. It has an approved Development Plan bearing no. 1629/18 dated 26. 11.2009. However sufficient DRR&P features have not been incorporated to the plan. Therefore the plan needed to be amended to incorporate DRR&P aspects.

Though in a lagging province, Vavuniya is growing in terms of urbanization. Based on the National Physical Planning Policy and Plan of Sri Lanka (2011-2030), Vavuniya UDA area is identified as a second order service centre of the region.

The major disasters affecting the Vavuniya city are floods, drought and strong wind. Other disasters include lightning, wild bees in schools and public property, epidemics such as dengue caused by stagnation of water and human elephant conflict. Disasters have caused disruption to livelihoods, property and business enterprises. Encroachment, land filling and unauthorized construction in man-made lakes and ponds, construction errors such as improper size of drainage, unsatisfactory quality of drainage constructions such as insufficient usage of concreate were a major contributory factor for floods.

Maritime Pattu PS area

The UDA declared area of Mullativu consist of 7 Grama Niladhari Divisions (GNDs). It was declared as an Urban Development Area by UDA based on the provisions given in section 3 of UDA Law no. 41 of 1978. It is noted that the DRR&P Plan has been prepared for the total Maritimepattu Divisional Secretariat Division consisting of 46 GNDs.

Mullativu/Maritimepattu Urban Area (MPS) is a lagging province. Nevertheless it is growing in terms of urbanization. Based on the National Physical Planning Policy and Plan of Sri Lanka (2011-2030), MUA is identified as a second order city.

The major disasters affecting the Mullaitivu town are floods, droughts and strong winds, cyclone and Tsunami. These disasters have caused disruption to livelihoods, property and businesses and also at times resulted in loss of lives.

Poor drainage and unplanned drainage in Tsunami resettlements are major causes of floods. As a result of the floods the roads become inaccessible hence there is difficulty in evacuating the affected.

Mannar DSD area

Mannar Urban Area (MUA), the entire island, was declared as an Urban Development Area by the Gazette notification bearing No.759/1 dated 22nd, March, 1998, by the UDA, based on the provisions given in section 3 of UDA Law no. 41 of 1978. However as sufficient DRR elements had not been incorporated to the Development Plan, the need arose to make necessary amendments. It is noted that the DRR&P Plan has been prepared for the total Divisional Secretariat Division including the section of the main land which is not declared by the UDA.

MUA is a lagging province. However it is growing in terms of urbanization. According to the National Physical Planning Policy and Plan of Sri Lanka (2011-2030), it has been identified as a second order, Special Purpose city and a Multi-Mode Transport Nodal Point.

The major disasters affecting the Mannar town are floods due to sea water intrusion, droughts and strong surge, cyclone and Tsunami. Disasters have caused disruption to livelihoods, property and businesses and also at times resulted in loss of lives.

Construction of an embankment to stop sea water intrusion was a key priority. Another cause of floods is due to encroachment of ponds. Earlier there had been 75-80 ponds in Mannar. Now it has reduced to 15-20 due to unauthorized constructions. Inadequate drainage network aggravates the problem.

The severity of the effects of such disruptions due to natural disasters as perceived by the vulnerable communities and the relevant Authorities were weak urban management, lack of coordination among the institutions, unplanned development and unauthorised constructions coupled with lack of awareness creation and non-participatory approaches in planning.

Therefore the stakeholders predominantly the Government institutions in all Project locations were in consensus that there was a need to develop City Development Plans and Land use Plans giving special consideration to DRR features. However the communities interacted with the Evaluation Team; the members of the DRTs, Lane Committees, Disaster Resilient Teams and the community in Action Project areas, although felt the need for a mechanism for DRR were not particularly aware of the need for City Development Plans and Land use Plans. Their priority needs were the Action Projects.

3.1.2 Relevance of Establishment of DRTs, Lane Committees and CDPCs

Although the vulnerable communities particularly women and children were the weakest link in DRR chain, there were no systematic structures in place to strengthen their capacities in these locations prior to commencement of the Project. In addition, there were no systematic procedures in place to integrate disaster related activities of different Institutions responsible

for Disaster Management, nor were there systems and mechanisms available for vulnerable communities to approach these officials. Hence all stakeholders considered DRTs, Lane committees and CDPCs as relevant.

3.1.3 Awareness Building

In general not much attention had been given to disaster preparedness of the communities prior to the Project. The approach taken by the authorities was more of a reactive nature with focus on post disaster relief work. Therefore there was lack of awareness of the communities in disaster preparedness. As a result irresponsible behaviour such as blocking drainage with garbage, clearing hilly terrains etc. which triggered or aggravated the effects of disasters was common across the Project locations. There was also lack of awareness of contractors and masons in disaster resilient building practices.

All stakeholders considered Awareness programmes conducted by the Project as very useful. No other organisations have conducted such programmes prior to the Project.

3.2 Effectiveness

3.2.1 City-wide Community-specific Vulnerability and Disaster Risk Assessments

Prior to commencement of the project only Ratnapura MC had flood hazard maps which were incorporated to the Development Plan 2006-2020. In other project locations, areas vulnerable to disasters had not been documented. Therefore identification of the natural hazards affecting the Project locations and the root cause of such hazards was a primary need.

A participatory approach was adopted combined with technical analysis of stakeholder feedback to identify areas vulnerable to disasters. First step was to prepare stakeholder inventories to conduct stakeholder workshops. Stakeholder lists maintained for previous disaster related activities in the respective Local Authorities and DS Offices helped in identifying and mobilizing some of the key partners. The participants were selected in consultation with Local Authorities, CBOs, Community Leaders and Project Officers. The Honourable Mayor of MC/ Chairman of UCs, Municipal Commissioner, Councilors, Public Health Inspector (PHI) and officers of Local Authorities, representatives of local community, Community Based Organisations (CBOs), Non-Governmental Organisations (NGOs), senior citizens, religious leaders, Grama Niladhari (GNs), Urban Development Authority (UDA), Disaster Management Centre (DMC), Divisional Secretariat Office (DS Office), National Water Supply and Drainage Board, Ceylon Electricity Board (CEB), Road Development Authority (RDA), Medical Officers of Health Unit (MOH), Land use Planning Department, Governmental agencies, which hold regulatory or management responsibility on environment such as Central Environmental Authority (CEA), Department of Meteorology, Forest Conservation Department, Department of Irrigation, NBRO were some of the invitees to the workshops and have contributed to the process for developing DRR&P Plan from commencement. Secondary data was collected from DMC, UDA etc.

During *Phase II* of the Project, professionals including Planners, Engineers, Architects and Designers were also consulted in the plan preparation process. This was a good initiative as it paved the way to include the professional point of view to the plans. The Participatory approach in Project implementation was appreciated by all stakeholder categories.

The initial workshops in the four locations Balangoda, Ratnapura, Batticaloa and Kalmunai under *Phase I* were conducted in April and May 2012 to introduce the Project objectives and explain the process to the stakeholders, elected members, officials and the local community. It was a step in the right direction as it helped the dual purpose of gaining stakeholder support from

inception of the Project and providing a platform to elicit necessary information from them. Focus Group Discussions (FGDs) were conducted for the purpose of obtaining information from stakeholders by listening to them and learning from their knowledge and experience. These helped in preparation of local level hazard mapping. Technical analysis of stakeholder feedback to identify vulnerabilities followed.

The workshops in the four locations Akkaripattu, Vavuniya, Mullativu and Mannar under *Phase II* were conducted in September and October 2013 for local level hazard mapping. The field observations and verification of vulnerable areas followed in February 2014.

The outcome of the workshop was as follows:

- Identification of the relevant stakeholders and updating the stakeholder inventory including contact details, addresses etc.
- Identification of the Hazards and their magnitude and frequencies of occurrence
- Identification of the most threatened communities, areas, and infrastructure needs at the local level
- Identification of the issues and causes of problems related to hazards

During the field observations the detailed information on identified risk locations, most threatened communities and other needs at the local level were elicited. Further the analysis results with regard to spatial distribution of hazard and risk areas were verified. Information needed to update assessment results; identified vulnerability levels and verified risk levels were obtained.

Second set of workshops were held in the *Phase I* Project locations during July and August 2012 for the purpose of validation of data collected from the first set of workshops and external sources.

At these workshops vulnerability and disaster risk assessment was carried out to assess city's physical, social, economic and environment vulnerabilities to disasters. Thereafter field observations were made to collect more information on identified risk locations, most threatened communities and other needs at the local level, verification of analysis results regarding spatial distribution of hazard, risk areas and to get information to update assessment results on identified vulnerability levels and verified risk levels. Further, hazard mapping sessions were carried out with community participation to identify high risk areas, the most threatened communities and areas and infrastructure needs.

At the workshop held in Kalmunai in addition to the above, the UDA Officers presented the draft Development Plan and discussed the development scenarios. Discussions were also made on revisions to be made and formulating development guide lines and regulations for the area.

During the workshops held for *Phase I*, an attempt was made to discuss regulations and guidelines on mitigating disaster management. However, as majority of the stake holders did not have much knowledge and interest on the subject, the discussions concluded within about 15 minutes.

Workshops in *Phase II* Project locations were held in March 2014 to validate the hazard/ risk maps and to identify the Action Projects for DRR. To observe and verify the identified Action Projects in *Phase II* locations, separate field visits were conducted in June 2014.

The process adopted to assess the risks was by validating the hazard assessments and hazard maps prepared by stakeholders, validation of vulnerability of social, economic and environmental aspects, capacity assessments of city using selected indicators such as Samurdhi recipients for poverty, Level of education, number of permanent houses, access to water and sanitation facilities, access to amenities and services etc.

After amalgamation of these factors with spatial analysis, the composite maps of flood, drought, strong winds etc. were prepared through overlay of spatial analysis. Finally the multiple risk area maps for the relevant Local Authorities were formulated by combining composite disaster maps.

The outcome of the stakeholder workshops:

- Identification of the issues and causes of problems
- Validation of the identified Hazard/Risk areas (to finalize vulnerability assessment)
- Relate to hazards in risk areas
- Identification of the disaster risk reduction strategies for hazard locations
- Identification of the action projects need to be implement by the local authority
- Prioritization of identified DRR actions
- Familiarizing with the action projects
- Community consultation and verification of problem background
- Validation of the proposed solutions

Thereafter a composite risk map was prepared overlapping the multiple risks of flood, drought and strong winds. The risks were classified as low, moderate, high and very high by giving equal importance to the relevant hazards when formulating the Multiple Hazard Risk maps.

The Project went a further step in *Phase II* to identify ten to eleven very high - risk locations which no doubt helped in narrowing the areas that needed to focus on when formulating DRR planning solutions. Thus maps were prepared systematically.

3.2.2 Formulation of Disaster Risk Reduction and Preparedness Plans for Selected Local Authorities

The DRR&P Plans suggest realistic and fundamental improvements to the existing DRR framework of the towns which minimize the effects of hazards and provide the Local Authorities and the citizens a clear and achievable direction to become a sustainable resilient city.[5] The communities in the resilient cities will have the ability to respond fast and adapt to disasters providing a better environment to live while harnessing the local potentials.

A comprehensive methodology has been adopted by the Project in preparing the DRR&P Plans. With the information collected from the above mentioned workshops and field observations, multiple hazards and very high risk zones were identified and Multiple Hazards Composite Risk maps were prepared for the eight Local Authorities. The weather forecasting assisted in predicting future whether patterns. The SWOT analysis was carried out to recognize the Strengths, Weaknesses, Opportunities and Threats that were there at the commencement of the Project to enable building on strengths already existing in the Local Authority areas. Core problems were analysed to identify key issues facing the towns.

Some of the common problems identified were as follows:

- Lack of awareness on disasters, disaster preparedness and mobilization skills

[5] Disaster Risk Reduction & Preparedness Plans

- Lack of technical capacity and access to GIS/ Remote sensing software in Government offices
- Lack of disaster resilient infrastructure development including drainage network
- High poverty and unemployment levels that undermine attention to disaster management
- Relatively poor collaboration among stakeholders
- Unsatisfactory environmental and natural resource management

These findings paved way to formulate strategic directions and identify Action Projects with structural and non-structural mitigation measures. The Strategic Directions aimed to improve economic, social and environmental stability by introducing development initiatives incorporating disaster risk reduction, empowering the community and holding service providers accountable. The Action Projects identified were prioritized in consultation with members of public, Planning Working Group, Government leaders and the other interested groups after field visits were made to observe and verify the identified projects sites. Thereafter the DRR&P Plans including the Action Projects were forwarded to UDA to be incorporated in the Development Plans to facilitate building sustainable resilient cities.

The main objective of implementation of the Action Projects is to minimise the effects of hazards and to improve the ability of the community to prepare, respond and quickly return to normalcy from a disaster. Therefore, the principles[6] incorporated in the strategic plans of the eight Local Authorities included the following:

- Adapting to live with disasters, pre-disaster recovery planning, resilience and sustainability;
- Incorporation of local knowledge, best practices and local primacy
- Unity of effort in building social capital for resilience of the society
- Partnership with reciprocal information flow, transparency and accountability
- Social inclusiveness and decentralize management mechanism
- Leadership, individual and family empowerment
- Technology, safety and comfort
- Timeliness, flexibility, effective and efficient use of resources

Implementation of Action Projects necessitate a series of steps from detailed designing, to identification of resources, cost benefit analysis, site preparation, construction and collaboration with a number of Government and non-governmental organisations. These organisations need to be linked from inception to foster ownership particularly in light of financial implications in connection with maintenance and monitoring and evaluation of impacts. The Local Authorities will have to develop indicators enabling proper monitoring. Also, it may be good to explore alternate funding opportunities from development partners and public-private partnerships from inception. Involving Lane Committees or DRR committees established by the GNs in the locality from the beginning is advantageous to foster community ownership of the Action projects as they too can assist in maintenance of the facilities.

The anticipated outcomes after implementing the action projects in the eight locations are as follows:

- Continuous process of knowledge gathering and sharing among the entire community
- Reduced risk and vulnerability
- Provide ways to adapt to the hazards faced
- Reduction in disaster causing behaviour
- Quick response to hazards
- A cooperative social capacity

[6] Disaster Risk Reduction & Preparedness Plans

- Skilled and knowledgeable population with regard to DRR
- Disaster responsiveness, empowerment and pro-activeness of the community

3.2.3 Disaster Risk Reduction and Preparedness Plans aligned to City Land Use Plans and City Development Plans

Multi institutional Planning Working Groups (PWG) were established for the purpose of incorporating DRR&P Plans to Land use Plans and City Development Plans. It is a good practice to engage multi-disciplinary working groups as they can provide opportunity for thorough decision making with technically best solutions.

The PWG consisted of the Mayor and Municipal Commissioner/ Chairman Urban Council, members of the UCs/ MCs, PHI, Local Authority Officers, representatives of local community, CBOs, NGOs, Senior Citizens, School Principals, Religious Leaders, GNs of risk areas, MOH, and relevant participant institutions including Urban Development Authority, Central Environment Authority, Disaster Management Centre, National Building Research Organization, DS office, Land use Planning Department, Forest Conservation Department, Survey Department, Disaster Management Centre, Provincial Road Development Authority, Meteorological Department, Department of Irrigation, Department of Agriculture, Provincial Council, Sri Lanka Telecom, Ceylon Electricity Board, National Water Supply and Drainage Board and Department of Coast Conservation where relevant.

The Officers from the DMU in Vavuniya confirmed technical group consultations during preparation of the DRR&P Plans. However, the representative from the District Land use Planning Office in Vavuniya expressed his concerns that their input was not considered despite they had the District Land use Plan prepared under a separate project, the previous year. He was of the view that important information may have been omitted from the DRR&P Plans. Nevertheless, the Evaluation findings revealed that sufficient information on land use had been considered in the planning process. In-depth consultations with all participants in the PWG and professional institutes may help in preventing such misperceptions. The future Projects may consider making use of the available information to the extent feasible to prevent duplication of work and wastage of limited resources.

At the third and final workshops held in November and December 2012, the draft DRR&P Plan of *Phase I* Local Authorities was presented to the multi institutional Planning Working Group (PWG) and the community for validation. The objective was to explore the possibility of incorporating Action Projects and mainstreaming DRR elements to the Development Plan for proper management of land use from a DRR perspective. The revisions to be carried out to formulate Building and Planning Regulations and guidelines for the respective areas were also discussed.

Thereafter Focus Group Discussions (FGDs) were conducted in December 2013 to finalise incorporation of the feasible DRR&P Plans to Development Plans of the respective Local Authorities. The objective was to incorporate DRR&P guidelines and relevant Strategic Directions with Action Projects to the Development Plan for proper management of land Use from a DRR perspective. Consequently, the Development Plans were prepared incorporating DRR&P regulations.

No workshops were held for *Phase II* locations. FGDs were conducted in August 2014 to discus and validate the proposed strategic directions and Action Projects. Review teams were also identified for revision of draft planning and building guidelines proposed to be implemented by the Local Authorities.

Preparation of Development Plans

UDA is the national body that has legal authority to prepare, gazette, implement and monitor the Development Plans in areas declared by the UDA under section 8(A) of the UDA Act. Although the mission[7] of the UDA is to prepare Development Plans and to promote, implement and regulate development activities, not all urban areas declared by the UDA has Development Plans due to resource constraints. In any event comprehensive DRR&P Plans have not been incorporated to Development Plans prior to the Project. Therefore incorporation of DRR perspective to the Development Plans can be attributed to this Project intervention.

UDA has delegated its planning powers to the local authority. Hence the Local Authority can carry out implementation and monitoring of the Development Plans through its planning committee.

All the Development Plans have followed the Development Planning Process introduced by the Project, under the technical guidelines given to mainstream DRR Features into Development Planning Process.

Phase I

Ratnapura MC area had a Development Plan (2006-2020) in force bearing gazette number 1483/8 dated 07.02.2007 at the time the Project commenced. It consisted of 2 volumes;

- Volume I - Situation report and zoning regulations
- Volume II - Planning and building regulations

However it had only certain DRR components which required to be improved in order to mitigate hazards identified by the project. Hence UDA has now prepared an amended Development Plan by incorporating DRR&P regulations with the input from the Project. The objective was to incorporate DRR&P guidelines and relevant Strategic Directions with Action Projects to the Development Plan for proper management of land use from a DRR perspective. This amended plan was approved on 11.08.2014 and subsequently gazetted. Gazette notification bearing no.1884/25 dated 14.10.2014 has been issued informing that the Amended Development Plan under section 8H of the Urban Development Authority (Amendment) Act No.4 of 1982 was approved on 11.08.2014.

At the time the Project commenced in *Phase I* Project locations ***Balangoda UC, Batticaloa and Kalmunai MC*** areas did not have Development Plans. With the input from the Project, UDA has now prepared the Development Plans for the said UC/MC areas incorporating DRR&P components. Prior to gazetting, the draft plans were forwarded to the Local Authorities and the UDA Planning committee for recommendations.

The Development Plans for Balangoda, Kalmunai and Batticaloa have been Gazetted by gazette notification bearing no.1868/8 dated 23.06.2014 issued informing that these Plans have been approved by the Honourable Minister of Defense and Urban Development under section 8A of the Urban Development Authority (Amendment) Act No.4 of 1982, by virtue of powers vested on him under section 8F of the said Amendment Act.

[7] http://www.uda.lk/about.html

The components of the DRR&P Plans incorporated into the Development Plans of the UDA are as follows:

Balangoda UC area

- The Development plan of 2014 has 2 volumes, the *Volume I* which comprises the ***Situation Analysis*** and *Volume II* which comprises ***The Plan*** incorporating Planning and Building Regulations
- The Planning process introduced by the Project to mainstream DRR&P to the Development Plan was followed by UDA in preparing the Development Plan of the BUC
- DRR&P has been incorporated to the Development Plan in the following chapters:
  <u>*Volume I*</u>
  - *Chapter 8* -Environment is discussed. In this chapter Environmental sensitive zone, Identified disasters, Disaster mitigation, Evaluation of mitigation and problems are discussed
  - *Subsection 8.2* explains flash floods and earth slips by using flood prone area and land slide prone area maps produced by the Project
  - *Subsection 8.3* Strategies identified by the Project are incorporated in the following manner:
    i Improvement of physical environment of the town and management of natural resources
    ii Awareness creation of the community on natural disasters through social information system
    iii Strengthen the effective response during the natural disaster period in order to minimise danger
    iv Minimise the dangers through continuous assessment, evaluation and coordination
    v An introduction of effective land use management process

<u>*Volume II*</u>

The ***Vision*** formulated in the Development Plan prepared by UDA for BUC is *'To develop Balangoda as the Agro Service Centre for agro feeder areas in the Ratnapura District and to develop the town as a residential town free from disasters.'*

Components of the DRR&P Plan incorporated to Development Plan:

- *Chapter 2* -Proposed Sub-Plans are discussed
- *Sub-section 2.5* - Disaster Management Plan is discussed under the sub headings of Expected Goals, Disaster Mitigation Strategies, Proposals to be implemented through the disaster Mitigation Plan, Strategies to minimise earth slips and guidelines for disaster zones
- *Sub-section 2.5.3* -Proposals to be implemented through the Disaster Management Plan ie; Strategies to minimise the earth slip danger is explained in the following manner:
  i To minimise the earth slips danger through turfing on sloped surfaces
  ii Take necessary action to absorb the surface water to control flooding and earth slips
  iii Protection of soil erosion through construction of retaining walls and drains on contours
  iv Development of mountain areas in an environmentally friendly manner to minimise the hazards
- *Sub-section 2.5.4* - Strategies to minimise earth slips *(should be corrected as floods)*
  i Plantation of trees in the adjoining areas of rivers, canals and waterways and provision of recreational areas for the public such as walkways with landscaped features
  ii Provision of linear parks in town centre areas

iii Provision of different type of plantation areas. Provision of linear parks along both sides of canals, rivers and roads and turfing of banks
iv Provision of protection zones, turfing, planting of environmentally friendly trees on both sides of river banks (Bamboo, Kumbuk trees etc.)
v Designing of buildings to withstand the floods

- *Sub-section 2.5.5* describes the guidelines for disaster zones and *Table no.4* describes the permitted and prohibited uses for earth slip danger zones and flooding danger zones based on central danger zones, low danger zones and high danger zones
- *Chapter 3.0* - Recommended action Plans are given in *Table 05* which indicate, Diversion of Dorawela Oya and development of bypass road as identified projects

BUC can now carry out implementation and monitoring of the Development Plan through its planning committee. However it was observed that the UC is not in possession of the Development Plan yet. The Project may share this information with the relevant authorities so that action can be taken to implement the Development Plans at the earliest.

Ratnapura MC area

The UDA, gazetted amended Development Plans of 2014 has 2 volumes;

- *Volume I*, which comprises the ***Situation Analysis***
- *Volume II,* ***The Plan*** incorporating Planning and Building Regulations and the Disaster Management Plan

The components of the DRR&P Plan, incorporated into the amended Development Plan of the UDA are as follows:

<u>*Volume I*</u>

- Chapter 8 - discusses the situation analysis and refers to Environmental Assets
- *Sub-section 8.2*- natural disasters are discussed. The Identified major Disasters are Land Slides and Floods. Minor disasters are strong wind, slight droughts and thunder. Further it explains the main problems related to disasters in RMC area referred to in Core Problem Analysis in table 12 of DRR&P report with a few amendments, under the topic *'Main Problems related to Disasters in Town'*.
- *Sub-section 8.2.2* - The Disaster vulnerability assessment incorporating the assessments carried out by the UN-Habitat project

<u>*Volume II*</u>

- *Section 1.2*- The ***Vision*** of the plan is *'to make Ratnapura a stable, safe and an attractive capital town of Sabaragamuwa Province.'*
- *Section 1.5* The objectives and strategies, sub sections 3, 5, 8 and 9 directly discuss 'mitigate disasters' and to develop a resilient city
- *Section 2.6*- Environmental Plan for RMC is discussed. Accordingly strategies for ecological conservation and Disaster Management Plan (meant to implement the UN-Habitat plan) to minimize disasters are suggested
  - *Sub-section 2.6.2* - Expected target of the Disaster Management Plan
  - *Sub-section 2.6.3* - Disaster management strategies
  - *Sub-section 2.6.4* - Suggestions made in the Disaster Management Plan is incorporated. ie; strategies to minimize risk of landslip, strategies to minimize risk of flooding and a table on Authorized Utilization of flood disaster zones and landslip disaster zones, based on High Risk, Medium Risk and Low Risk zones identified by the project
- Based on the strategies to minimize risk of landslide and risk of floods certain parts of the following Action Projects of DRR&P Plan are incorporated to the Development Plan

- Strategy to integrate water runoff management mechanism, mainly the drainage plan for the Ratnapura MC
- Strategy to improve slope stability
- Strategy to promote urban horticulture and rain water utilization
- Strategy for urban beautification
- Strategy to integrate solid waste management mechanism
- *Sub-section 3.2* - planning regulations and zoning regulations: following urban zones are identified by UDA development Plan:
  Low density residential zone, High density residential zone, Mixed residential zone, Administrative zone, Conservation zone, Poojabhumi zone, Ecological sensitive zone and Special conservative zone
- When zoning, the activities high and moderate hazard zones identified by the DRR&P report are being zoned for Low Density Residential by UDA and Low hazard Zones of DRR&P Plan for High Density Residential Zone by UDA. Further the activities are being curtailed in Low Density Residential Zones since they are more vulnerable towards hazards (refer tables 3.1- proposed permissible uses for flood zones, 3.2- permissible uses for landslide zones, 3.3 permissible uses for cyclone hazard risk zones and 3.4 proposed permissible uses for lightning hazard risk zones in Planning and Building Guidelines for DRR in city of Ratnapura in DRR&P Plan prepared)
- *Sub-section 3.2.14* - Ecological Sensitive Zone, natural parks, agriculture plantation, leisure and recreational activities etc. are promoted, without any construction
- *Sub-section 3.2.15* - Special Conservation Zone, victimized lands for landslides; if there is a possibility of landslides occurring or if the land slope is 60 degrees or more, no construction is permitted. Only natural forests are permitted

- *Annexure I of volume II* specifies the plot size, plot coverage, Floor Area Ratio (FAR), maximum height and minimum width of site based on gradient of the slope for Low Density and High Density Residential Zones. ie; when the gradient of the slope is steep the development has to be of low density nature. It is permitted, in both zones. (DRR&P Plan and UDA)
- The UN habitat project report on Planning and Building Regulations (table 3.5 and 3.6) have given different specification and values for High, Moderate and Low Risk Zones for the same components of plot size, plot coverage, Floor Area Ratio (FAR), and maximum height of sites. However UDA has amended and modified those given values in the amended Development Plan in *Annexure I*
- *Annexure III*- specifies the Kalu Ganga and Way Ganga reserves as 66ft. The DRR&P project report has amended the Kalu Ganga and Way Ganga reservations as 33 ft. *(table3.8)*. It was mentioned by UDA that the width of river reservations cannot be amended without the concurrence of the Department of Irrigation
- *Annexure VII* - Reserve requirements for mining - the same specifications are adopted by the Project too
- *Annexure VIII and IX*- specify special requirements to fulfil the flood victim and landslide victim areas. In flood victim areas only 2 floor buildings; buildings on stilts and ground floor can be used only for parking, are incorporated to the Development Plans as mentioned by the DRR&P report

Batticaloa MC area

The components incorporated to Development Plans are as follows:

<u>*Volume I*</u>

- *Chapter 8*- Environmental Assets
  - *Subsection 8.3* gives a situational analysis on Hazards in and around the city. Accordingly Floods, Tsunami, Cyclones and Sea level rise are analysed. The maps prepared in DRR&P

Plan on flood hazards, Tsunami affected area, cyclone path of Sri Lanka, sea level rise area and the composite multiple hazard risk maps are incorporated by giving reference to UN-Habitat project

Volume II

- *Chapter 1- Section 1.2*- the ***Vision*** of the plan is stated as '*Create Disaster Resilient Commercial and Tourism hub of the East'*
- *Chapter 1- Section 1.3*- Objectives and Strategies - two of the objectives are to develop specific guidelines to minimise hazards and to preserve and conserve environmental sensitive areas. The strategy is to mitigate natural disasters by introduction of DRR method, introduction of new techniques to the building regulation and improvement of proper drainage pattern
- *Chapter 2- Sub-section 2.1* - The proposed zoning plan by urban activities is given in *Table 01*
- *Sub-section 2.1.2* - under general zoning regulations, special regulations given for disaster prone areas such as: A clearance from UDA and other relevant institutions to be obtained
- *Section 2.7*- The Disaster Management Plan is incorporated giving the background. All strategic Action Projects identified in DRR&P Plan is incorporated to the Development Plan:
  - Green Belt development at Poonachimunai, Kallady Beach Park, Thiruchendur, Dutch Bar area, Navalady South, Navallady North
  - Construction of Gabion and flood retention wall at Poompugar Lagoon area, Puliyantivu, Kachcheri Lagoon side, Sathurukondan Lagoon side, Pillaiyaradi Lagoon side
    In addition to the UN Habitat proposals, UDA has proposed gabion walls at Sethukuda Lagoon side, Veechchu Kalmunai Lagoon side, Victoria - Munich Friendship Road (Muhathuvaram, Palameenmadu, Thimilaithivu Lagoon side)
  - Lagoon capacity expansion: Bar mouth expansion at Kallar and Palmeenmadu, Excavate the bottom of lagoon, increase mangrove plantation in the lagoon area, prohibit the filling of low lying areas and the lagoon
  - Construction of evacuation routes (as it has a high risk of Tsunami)

The Chapters of the Development Plan has been prepared by following the new Planning Process introduced by UDA in consultation with UN-Habitat Project. ie; The analysis of environmental situation in *Chapter 08 of Volume I* under sub heading of Hazards in and around the city.

Volume II, chapter 02, under the sub heading of Proposed Sub Plans, Disaster Management Plan is proposed. (These two chapters have incorporated the strategic proposals of UN Habitat project).

Taking a proactive step Batticaloa MC in collaboration with UDA has produced '2030 Batticaloa Development Plan' incorporating proposals in the DRR&P Plan and are working with another Development Partner for implementation, an instance where different institutions have responded to a common cause bringing about greater synergies for betterment of the general public.

Kalmunai MC area

The components of the DRR&P Plan, incorporated into the development plan of the UDA:

Volume I

- *Chapter 8*- Environmental Assets
  - *Sub-sections 8.4 and 8.5* give a situational analysis on Hazards and Multi hazard risk assessments respectively. Accordingly, Floods, Tsunami and Cyclones are analysed. Further the maps prepared by UN-Habitat Project on flood hazards, Tsunami affected

area, Cyclone path of Sri Lanka and the composite multiple hazard risk maps are incorporated to the Development Plan, by giving reference to UN-Habitat project

Volume II

- *Section 1.2*- the ***Vision*** for Kalmunai is '*Strengthening of the city's trade, economy and agriculture by effectively mobilising such potentials and thereby improving the Disaster Resilient trade corridor*'
- *Chapter 1, Section 1.3*- Objectives and Strategies- one of the objectives is to create a disaster resilient city
  The strategies are to prepare and implement the DRR&P Plan, direct the development activities in the city in accordance with the proposed zoning plan and DRR guidelines, direct the development in the coastal area according to the coastal management plan of the Department of Coast Conservation, implementation of environmental landscape plan in accordance with the UN-Habitat plan
- *Chapter 2, Sub-section 2.1* - The Proposed zoning plan by urban activities is given
- *Sub-section2.1.1 (10)* General zoning regulations - Provisions given to declare any area by a gazette notification as a special development area for special zones such as areas which are subjected to natural disasters
  Section 2.5- Some of the main Strategic Action Projects in the DRR&P Plan of UN-Habitat is incorporated to the Development Plan:
  - Citywide Drainage Network and Canal Improvement Project
  - Thorna Expansion
  - Integrating waste water management with drainage network improvement
  - Construction of Tsunami evacuation routes

The Chapters of the Development Plan has been prepared by following the new format prepared in consultation with UN-Habitat Project.
Ie; *Volume I - Chapter 08*- Analysis of environmental situation; under subheadings *8.4* and *8.5* Hazards and Multi hazard risk Assessment are discussed respectively.
Volume II - Chapter 02- under the sub heading of proposed Sub-Plans, Disaster Management Plan is proposed. These two chapters have incorporated the strategic proposals of UN-Habitat project.

Phase II

Vavyuniya UDA area

Vavuniya UDA area has a gazetted Development Plan, Vavuniya 2009. It has 2 volumes;

- The Volume I - comprises the Situation analysis and The Plan
- The Volume II - comprises Planning and Building Regulations

The gazetted Development Plan of Vavuniya was amended by incorporating DRR&P features proposed by the Project. The amended draft Development Plan is in the process of being re-gazetted. It has followed the new planning process introduced by the Project.

DRR&P features are incorporated to the Development Plan in the following chapters as an amendment to the already gazetted Development Plan bearing No. 1629/18 dated.26.11.2009. The components of the DRR&P Plan incorporated into the Development Plan of the UDA are as follows:

Volume I

- *Chapter 10*- Natural Environment (Gazetted Development Plan)
  - *Sub-section 10.1*- Environmentally sensitive and conservation areas (gazetted Development Plan)

- *Sub-section 10.2- 'Environment and Assets'* inserted to the amended Development Plan, the sub headings climatic conditions, rainfall, topography, hydrology, soil type and natural hazard areas are described by incorporating same items mentioned in the Project DRR&P Plan
- The maps prepared by the Project; Flood Prone Hazard Areas, Drought Prone Hazard Areas, and Strong Wind Prone Hazard Areas are also incorporated
- The issues and problems identified by the UN-Habitat report are also incorporated

<u>*Volume II*</u>

- *Sub-section12.1* - The draft amended Development Plan has repealed and substituted the ***Vision*** of 2009 plan as *'to develop Vavuniya Urban Development Area as a transmission centre between the Northern Province and the Southern Province, as the icon city of trade, commerce and administrative functions and to create a Disaster Resilient commercial city.'*
- *Sub-section 12.3* - under the strategies Mitigation of Natural Disasters is identified and proposes to introduce Disaster Risk Reduction methods and new techniques to the building regulations and to improve a proper drainage pattern
- *Sub-section 15.0A- Chapter 15* is repealed and substituted by amending the zoning for urban uses while recognising the disaster prone areas
- *Sub-section 15.1.1* Inserted the following conditions to be adhered for disaster prone areas:
  - A clearance from UDA and other relevant institutions should be obtained prior to any development activity taking place
  - Certificate of a Structural Engineer to be provided with the building plan regarding the disaster mitigation methods
  - No person shall use any site or building for a purpose other than that have been approved in the development permit
  - Prior approval to be obtained from Sri Lanka Land Reclamation and Development Corporation in respect of reclamation of low lying lands
- *Chapter 18*, a new chapter is added to the amended Development Plan by including the following which are in accordance with the DRR&P Plan of the Project:
  - Subsection 18.1 – Background
  - Subsection 18.2 - Action Projects:
    - *18.2.1* - In order to minimise the risk of floods, eleven detailed infrastructure improvement projects identified by the DRR&P Plan have been incorporated
    - *18*.2.1 - Three Action Projects identified by the DRR&P Plan to minimize the risk of disasters, protect natural resources and reduce risks from droughts by using land use planning have been incorporated
    - *18.2.3* - Four Action Projects in connection with planning for recovery to enable economic opportunities, identified by the DRR&P Plan have been incorporated
    - *18.2.4* - Four Action Projects identified by the DRR&P Plan has been incorporated in order to reduce disaster risks through continuous assessment, evaluation and monitoring

Akkaripattu DSD, Mullaitivu PS and Mannar DSD areas

The urban areas Akkaripattu MC, Mullaitivu PS and Mannar Island have no Gazetted Development Plans. The Development Planning process of UDA was initiated for these three towns after the Project commenced preparation of DRR&P Plans. UDA is incorporating DRR elements in the DRR&P Plans when drafting the Development Plans of these towns.

The ***Vision*** formulated for Akkaripattu in the DRR&P Plan is 'to make Akkaraipattu a resilient city.' The UDA declared area of Akkaraipattu consist of 23 GNDs of Municipal Council Area and 5

GNDs of Pradeshiya Sabha. Although the DRR&P Plan has been prepared for the total MC and PS areas the Development Plan has been confined to only the MC area. Therefore Project may communicate this information to the relevant officials of the UDA to prevent wastage of Project resources. Had there been better coordination between the UOM and UDA this situation may have not arisen.

In the case of Mullaitivu, the ***Vision*** formulated in the DRR&P Plan is to 'provide s*ustainable and resilient development that preserves and nurtures the unique natural environment combined with a secure and healthy living environment for citizens and visitors.'* Despite DRR&P Plans have been prepared for the total Maritimepattu Divisional Secretariat Division, the draft Development Plan has included only seven Grama Niladhari Divisions as only these GNDs have been declared by the UDA. The balance area will not be covered by the Development Plan.

The ***Vision*** formulated for Mannar is *'to make Mannar an exemplary regional city, with a disaster free environment developed through sustainable and resilient planning to provide better living conditions for its citizens, future generations and visitors.'* It is expected that this vision will make Mannar a resilient, livable city while harnessing the local potentials. The DRR&P Plan has been prepared for the total Mannar Divisional Secretariat Division (DSD) including the mainland. However as the mainland area of Mannar DSD is not declared by UDA as an urban area, the Development Plan will be confined only to the island. Hence the Project may forward the DRR&P Plans of the balance areas of Mullativu and Mannar to the relevant authorities responsible for development activities so that the optimum use can be made preventing wastage of Project resources.

Validation of Proposed draft Development Plans

A stake holder meeting had been convened to validate proposed draft Development Plans of Akkaripattu towns at Local Authority level. However AMC has requested further discussions with stakeholders of all relevant sectors prior to finalising the plan. No stakeholder meeting has been arranged to validate the proposed Development Plans of Mullaitivu and Mannar Island yet.

The following procedure has to be adhered to prior to gazetting the Development Plans of the above areas:

- Finalise the Draft Development Plan
- Submit to the Stakeholder meetings at the respective local Authorities in Akkaraipattu, Mullaitivu and Mannar
- Obtain Local Authority comments (section 8D of UDA Law)
- Submit to the Planning Committee of UDA for its recommendations (section 8E(1) of UDA Law)
- Submit to the Board of Management of UDA, for its recommendations (section 8E(2) of UDA Law)
- Obtain Approval from the Honourable Minister in charge of Urban Development (Minister of Urban Development, Water Supply and Drainage) (section 8F of UDA Law)
- Issue the Gazette notification (section 8G (a) of UDA Law)
- Publish in daily newspapers in three languages, Sinhala, Tamil and English informing the public with regard to the approval of the Development Plan (section 8G(a) of UDA Law)

Therefore it will take will take at least another six months to publish the gazette notifications of the Development Plans of the *Phase II* Project locations Akkaripattu, Mullativu and Mannar.

Other benefits from the Project:

Physical Planning

- The Project provided funds and technical guidance to UDA to conduct a two day awareness creation workshop on 'Preparation of Development Plans incorporating DRR Components to build Disaster Resilient Cities' for island-wide physical planners. Around 200 urban Planners participated in the programme
- One day workshop on DRR was held with the support of UDA for local government officers and technical personnel involved in planning sector to upgrade their knowledge in issuing Development Permits for building approvals
- Two, one day awareness campaigns on DRR was conducted by UOM for local Government officers and the technical personnel in the cities
- Facilitated by UOM, a training programme on Basic and Advanced Analysis module on GIS was conducted for Local Authority and UDA officers to update their technical knowledge for disaster situations
- 2 Three day training programs conducted on preparation of maps using GIS in Eastern province and Southern province for UDA officials

Awareness Programs for Preparation of Development Plans:

Three awareness programs for preparation of development plans were held in 2013 with 172, 178 and 146 planning professionals participating in the programmes respectively. The first session covered subject areas such as new format for preparation of Development Plans, SWOT analysis and Disaster Risk Analysis. The second session included preparation of development guide plans and investment plans. The third session covered preparation of project brief, communication skills development and report writing skills.

Participant assessment of the Capacity Building Programmes conducted:

Table 4 **Participant Assessment of the Capacity Building Programmes**

No.	Level of Satisfaction	Result		
		Session I	Session 2	Session 3
1	Success of the workshop	99%	95%	80%
2	Level of satisfaction of the content of the workshop	80%	78%	90%
3	Presentation skills of the resource person	100%	70%	70%
4	Necessity of more workshops	90%	70%	65%

Outcomes:

- A new format for preparation of development plans was introduced incorporating DRR&P to *Volume I - chapter 8* under the topic of environmental assets
- In *Volume II chapter 2* the proposed plan is discussed, a disaster management plan has to be prepared
- The training programme had triggered acceleration of Development Plan preparation process in 36 UDA declared areas that need to build resilient cities, in addition to the eight (8) towns identified by the Project

The Project also donated Desktop computers and other accessories to Deputy Directors of UDA stationed in Batticaloa and Kalmunai.

UDA and DMU officers confirmed participation in these programmes. The knowledge gained on GIS, provision of computers together with the latest software was well appreciated as, if not for this Project they would have not had the opportunity to have these facilities which are very useful for hazard mapping, analyzing and reviewing data to prepare Development Plans.

However, it was revealed during the Evaluation that the training had been provided to the UC Librarian in Vavuniya, who does not need such training in discharging her duties and responsibilities. Therefore future Projects may give due consideration to training needs of the participants prior to selection for training to make the best use of the limited resources.

3.2.4 Introduction of DRR into Building Guidelines

The existing rules and regulations pertaining to building construction analysed by the Project team appointed for the purpose were:

- Planning and building regulations of UDA (gazette no. 392/9 dated 10.03.1986)
- Planning and building regulations made easy by UDA (gazette no. 392/9 dated 10.03.1986)
- Proposed structural plans
- Draft Development Plans prepared for Urban Development Areas (prior to gazzetting)
- Other legal provisions and Acts are mentioned below:
  - Land Development Ordinance
  - Sri Lanka Land Reclamation and Development Act
  - Crown Land ordinance
  - Coast Conservation Act
  - Tourism Act
  - Fisheries and Aquatic Resources Act
  - Antiquities Ordinance
  - NBRO guidelines
  - Sri Lanka Urban Disaster Management Project (SLUDMP) guidelines
  - Department of Irrigation requirements

A Team from University of Moratuwa, Faculty of Architecture and Department of Town Planning were given the task to '*prepare building guidelines incorporating DRR elements*.' The Team has prepared a comprehensive report covering all features of buildings captioned 'Planning and Building Guidelines for Disaster Risk Reduction' in Cities for *Phases I and II.*

- *Planning Guidelines*
  - The amendments and new guidelines are based on hazard zones for floods and landslides
    Table 3.5 - Minimum Plot size and relevant guidelines
    Table 3.6 - Plot coverage and relevant guidelines
    Table 3.8 - Canal reservations
    Table 3.10 - Open spaces around the building and relevant guidelines
- *Planning and building guidelines*
  - Site design: Set back
  - Landscaping: Vegetation management along rivers, streams and reservoir reservations
  - Landscaped flood walls
  - Structural mitigation measurement for higher walls
  - Vegetation management along steep slopes
  - Avenue tree plantation for cyclone and high wind prone areas
  - Land use suitability
  - Site design/ preparation/ construction
- Plot size
  - Plot size managed in flood prone areas
  - Plot usage
  - Building height in flood and landslide prone areas
- Open Spaces
  - Open space and rear space in landslide risk areas

- Foundation
  - Raised foundation for flood prone areas and tsunami prone areas.
- Foundation for cyclone and high wind prone areas
- Building shapes
  - Plan forms and orientation for cyclone and high wind prone areas
  - Spatial arrangement of buildings for cyclone and high wind prone areas
  - Flood resilient building designs
  - Cost effective upper floors
  - Floating houses
- Wall
  - Wall construction for cyclone, high wind prone and Tsunami areas
- Roof
  - Projection and anchoring in cyclone and high wind prone areas
  - Anchoring of roof framing in cyclone and high wind prone areas
- Flat roofs
  - Sheeted pitched roofs
  - Clay tile roofs
  - Use of ferro cement as rafting material all for cyclone and high wind prone areas
  - Thatched roof for protection for cyclone and high wind prone areas
  - Overhangs, patios and verandas for cyclone and high wind prone areas
- Door and window openings
  - Door and window opening for cyclone and high wind prone areas
  - Opening arrangement in garage for cyclone and high wind prone areas
- Floors
  - Construction of floors for cyclone and high wind prone areas
- Framed buildings for cyclone and high wind prone areas
- Balcony placement for cyclone and high wind prone areas
- Staircase arrangement for cyclone and high wind prone areas
- Chimneys and flues for cyclone and high wind prone areas
- Retrofitting existing buildings for cyclone and high wind prone areas
- Resilient infrastructure
  Surface water drainage, Waste water drainage/disposal, Waste water treatment, Storm water drainage and disposal, Sewage and waste water treatment, Water supply, Road accessibility, Access management, Electricity and power generation, Telecommunication, Parking, Fire and safety
- Other relevant regulations and guidelines
  - Provision of sea walls to reduce forceful effect of Tsunami waves
  - Flood barrier as flood protection
  - Spatially and socially compatible flood protection system along rivers
  - Elevation modification in flood plain areas
  - Assist flood evacuation paths

The guidelines incorporated to the Development Plans of Ratnapura and Balangoda in *Phase I* locations are as follows:
The plot size, plot coverage, building height and canal reservation regulations are incorporated to the amended Development Plans with some amendments and modifications of specifications on the gradient, sizes of lot, FAR, plot coverage, building height and open spaces.

However the other planning and building guidelines, resilient infrastructure guidelines and other relevant disaster resilient guidelines stated above have not been incorporated to the Development Plan due to practical issues in implementation. Although these regulations are

self-explanatory with designs and pictures, it was not possible to incorporate to UDA and LA regulations as it is, due to inadequate specifications and quantification. Further, Acts and Ordinances cannot be amended at short notice without adhering to laid down legal procedures involving lengthy discussions with relevant Government Institutions. For example it is necessary to have discussions with Government Institutions such as Department of Irrigation to reduce the Kalu Ganga Reservation in Ratnapura MC area from 66 feet to 33 as recommended by the project team.

Wherever possible UDA has modified/ amended specifications of certain regulations prior to incorporation. Eg; *Annexure 02 of volume II* specifies Planning Specification for sloped lands in Residential Zones; Residential Zone I and Mixed Residential Zone, by giving the gradient, minimum extent, plot coverage, Floor Area Ratio and width of the lot of land and maximum height of the building.

Nevertheless due to the significance of these guidelines in building resilient cities, it was proposed by the relevant institutions that they are sufficiently specified and quantified to enable conversion to regulations so that they could be incorporated to UDA Development Plans. If it is not done, the opportunity to implement them will be lost. Until such time the regulations are drawn it is recommended to upload to the websites of UDA and UN-Habitat for awareness of the public. Circulation through the Local Authorities for public awareness is also another option available at this stage.

In the case of *Phase II* Project locations work sessions were conducted in October 2014 to revise the proposed Planning and Building Guidelines. At these sessions the proposed Planning and Building Guidelines were discussed and validated. Also, new guidelines were identified in order to reduce the disaster risks. As a result an amended set of Planning and Building Guidelines were compiled incorporating DRR features for flood, cyclone and Tsunami prone areas. As the preparation of draft Development Plans are in progress, these guidelines have not been incorporated to it yet.

Awareness Building on Disaster Resilient Construction Practices

Under Phase I of the Project NBRO conducted awareness creation programmes for masons, craftsman, carpenters and plumbers in disaster resilient construction techniques. Qualified engineers and architects were engaged for the purpose as resource persons. Each Lane Committee was represented by 2-3 members.

The topics covered included accepted standards in building construction, repercussions of unauthorized constructions, disaster resilient construction techniques from selecting an appropriate site, land clearing, laying the foundation to construction of the walls and roof and obtaining electricity connections etc. It was well accepted by the participants who did not have prior exposure to such programmes.

Under Phase II, ICTAD was engaged by the Project to train masons, craftsman, carpenters and plumbers in disaster resilient construction techniques. It was a comprehensive two (2) day programme with practical training. Topics covered were Types of natural disasters, How natural disasters affect buildings, Disaster resilient design and construction practices, Selecting a proper site, Appropriate location and orientation, Shape and profile of the building, Ensuring the structural integrity of the building, Guide to a safe and efficient construction, Quality control and best practices, Reducing wastage and maximizing the safety of materials at the site, Safety precautions, Aftercare of completed work and Building Regulations.

Training programme was conducted by qualified engineers. Construction site to site visits were made by the interviewers to select the participants for the programme. Their mandate was to train 200 however altogether 280 participated in the 4 training programmes organized in the 4 Project locations, Vavuniya, Mullaitivu, Mannar and Akkaraipattu. Now there is a big demand for the trainees so much so the participants from Vavuniya had no free time to take part in the Evaluation discussions.

The participants who interacted in the Evaluation were very happy with the programme and expressed that they practice the learnings. They have never had the opportunity to participate in a programme of this nature before. For the first time they learnt about disaster resilient design and construction practices. The content was easy to understand as audio visual techniques were used. What they taught was practical. ICTAD Officials stated that yet there remained a huge demand for the programme, further demonstrating the success of the programme.

DRR in the construction industry has been identified as an Action Project in the Akkaripattu DRR&P Plan which proposes to offer the training as an ongoing programme to build capacities. It can be recommended to be extended to all Project locations of both *Phases I and II.* However, the participants in Akkaripattu though highly satisfied with the training were of the view that it is more beneficial to provide separate training programmes to carpenters and the masons. They were also of the view that construction of rain water harvesting tanks was not suitable for Akkaripattu due to lack of space in overpopulated areas with unplanned constructions. Hence thought may be given to customize the programme content based on the requirements of the locality. The Project may communicate participant views to ICTAD so that the programmes can be modified accordingly to suit the beneficiary needs.

However majority of the officials or the community who were involved in the Evaluation were not aware of the training programme. The Evaluation Team observed several construction sites which had not adhered to the disaster resilient construction techniques. The Project may advise the Local Authorities and the GNs to display a list of participants so that a wider segment of the community can harness the benefits of this programme.

3.2.5 Institutionalisation of DRR Practices into City Planning and Governance

With the objective of institutionalization of DRR practices into City Planning and Governance, the Project established City Disaster Preparedness Committee (CDPCs) under *Phase I* of the Project. Under *Phase II*, the Local Authorities collaborated with the Technical Working Groups formed by Disaster Management Units without reinventing the wheel, preventing duplication of activities to achieve a common goal.

Phase I

Even prior to the Project, ***Balangoda UC*** had a well-established institutional set up; an Environmental Management team, which has developed competencies to address challenging issues through high willingness, innovative ideas and team work. They have gained experience in working with communities, line agencies and international agencies over two decades.

After commencement of the Project CDPC, a Technical Working Group named 'Disaster Risk Reduction and Climate Change Adaptation Committee' was established in the UC through a Council decision. It is chaired by the Chairman of BUC. PHI has been appointed as the Secretary. Other committee members include two Council members from the Governing party, one member from the opposition, Superintendent of Works (SW), Environment Officer (from DS Office), Environmental Police, DMC Representative (from AGA Office), Technical Officer

Engineering Office Balangoda, Environmental Activists, two Social Animators from the Lane committees (Now 3R Society), two senior citizens.

The CDPC meets monthly prior to the UC Council meeting to discuss the work plans for the ensuing period of 3 months. They discuss the issues forwarded by the Lane Committees and refer to the Council meeting or the relevant institutions. The Minutes of the Committee and the budget estimates are presented to the Finance Standing Committee for review of expenditure and thereafter to the Council meeting for further review and approval.

The Lane Committee members interacted in the Evaluation commended the CDPC members for taking appropriate action with a special interest in disaster response work. They can be easily reached when needed. However the CDPC has no TOR. The members take guidance from the UC Chairman, DS and the PHI in case of a disaster. They conduct monthly meetings to plan their work and monitor the progress with the objective of making Blangoda a resilient town. If they continue their work at the same vigor, in time to come they may be able to achieve 'resilient city' status.

Nevertheless thought may be given to prepare a Terms of Reference (TOR) pinning down responsibility to each member so that they will be clear on their duties and responsibilities. More so, as the elected members could change and the officials are transferred to other locations periodically.

CDPC in ***Ratnapura MC*** was established through a decision of the Council. It functions as an Advisory Committee during disasters hence takes more of a reactive approach yet. The CDPC comprise of the Honourable Mayor, Deputy Mayor, Municipal Commissioner, Councilors from disaster areas, DS, area GNs, DMC, Environment Police, Police Life Saving Unit, Irrigation Engineer, and other Government and non-Government officers working in the area depending on the hazard. It is proposed to conduct committee meetings of the CDPC once in two months from 2015. If these meetings take place as planned they may be able to focus more on disaster preparedness.

Preparation of a TOR for CDPC in Ratnapura MC also needs attention. At present, the Mayor, Municipal Commissioner, GA and the DS work with the CDPC providing direction and guidance to the officers engaged in response and relief operations during the disasters. They are easily accessible when needed.

Appointment of a Standing Committee by the name 'Environment Protection and Disaster Management Committee' for DRR purposes in Ratnapura MC is a significant achievement of the Project. It is chaired by the Deputy Mayor and consists of six Council members, and the Health and Engineering Departments of the MC. The Standing Committee meets once a month. The minutes of the DRR Standing Committee and the budget estimates are presented to the Finance Standing Committee for review of expenditure and thereafter to the Council meeting for further review and approval. Together with the CDPC and Lane Committees, Ratnapura MC could work towards building a sustainable and resilient city as proposed by the project in time to come.

In ***Batticaloa MC,*** CDPC was established by the Commissioner through a Resolution as the Council had been dissolved since 2013. Prior to the Project the Technical Committee of the Engineering Department had been solely responsible for the technical aspects of the disaster response work.

The CDPC members consist of GA, DS, Commissioner and Engineer of the Local Authority, GNs, representatives of UDA, CCD, CEA, Department of Irrigation, DMC and other Government and non-Governmental officers working in the area. This committee functions as an Advisory Committee giving special focus for DRR related issues. However no action has been taken to introduce a TOR for CDPC. However the Commissioner felt that there was better coordination among the Institutions after commencement of the Project.

Two meetings are held quarterly, one at District level and the other at Divisional level particularly prior to monsoon periods. During the disasters emergency meetings are held until resettlement of the displaced persons. Yet their focus seems to be more on relief and rescue operations rather than resilience.

The Lane Committee members involved in the Evaluation particularly appreciated the commitment and the coordination efforts of the Municipal Commissioner, Municipal Engineer, Technical Officer and his workforce and the area GN during the recent floods. They felt that another committee (CDPC) is not needed as this team is able to coordinate the issues during a disaster, well.

However it was observed that CDPC could intervene to resolve issues through the improved coordination mechanisms established with other state institutions to reduce inconvenience to the residents whilst minimising wastage of public funds. For example the flood situation in Batticaloa had aggravated due to the concrete roads constructed without drainage facilities as there was no provision for the waters to recede. As a result houses were inundated even after the rains ceased whereas earlier only the gravel roads became muddy due to stagnation of water. The only solution for the community had been to cut through the concrete roads for the flood waters to flow. The community has made representations to the MC even during the 2013 floods. When probed further it was revealed that the provision of SLRs 1mn for a concrete road was insufficient to build the required drainage. CDPC could mediate with the relevant institutions to stop recurrence of such issues.

Kalmunai MC too established its CDPC through a Council decision. The committee members include the Honorable Mayor, Divisional Secretary, Municipal Commissioner of KMC, KMC Engineer and MOH. The main function of this committee is to provide advice during disaster rescue and relief operations hence it predominantly takes a reactive approach. They meet periodically, particularly during disasters so that the relief work can be carried out smoothly. They felt that coordination between KMC and DS Office officials has improved since establishment of the CDPC.

However, the Lane Committee members who were from the Tamil DS Division interacted with the Evaluation Team were disgruntled that the Kalmunai MC is biased towards the Muslim DS Division in general and in particular during disaster relief activities such as distribution of relief items and aid.

In order to address Disaster Risk Reduction and Preparedness strategies, the Project may advice the UC/MCs to develop a TOR for the CDPC. It will help each member to be clear on his/ her role and responsibilities in preparation and disaster response activities. It will facilitate prompt identification of disasters and improve response sensitivity so that the negative impact from the disasters could be minimized.

Phase II

Akkaripattu MC had formed a technical committee comprising of the Government Agent, Mayor, Municipal Commissioner, DS, technical officers from both MC and Divisional Secretariat, Disaster Management Units from MC and Divisional Secretariat, Assistant Director of Planning – DS office, Police, Armed Forces, Sri Lanka Navy, Transport Manager-MC, MOH, PHI, Medical Superintendent of the hospital and the Honourable Minister, who is also the Chairman of the District Coordinating Committee, prior to the Project. The MC Commissioner expressed that the disaster coordination among these Government Agencies has improved since commencement of the Project.

The Committee meets the community during floods (or other disasters) from time to time. The Rural Development Societies (RDSs) in the 28 GNDs coordinate from the grassroots level. However, more knowledge in DRR&P is required for RDS representatives to be proactive. Therefore training and awareness creation covering all GNDs is recommended if the resilience capacity of the communities is to be enhanced.

In ***Vavuniya***, Disaster Management Unit (DMU) had formulated a technical committee at District level by the name, District Disaster Management Coordinating Committee (DDMCC). The relevant officials such as the GA, Divisional Secretaries, UC, Armed Forces, Sri Lanka Navy, Road Development Authority, Electricity Board, National Water Supply and Drainage Board and Department of Irrigation participate at the meetings convened once in three months. Monthly Divisional level meetings are conducted at alternate DSDs with the RDS and religious leaders in the area participating. With the establishment of the DRR unit, the Committee has been reactivated, working systematically. The Officers from the DMU who interacted in the Evaluation confirmed that there was better coordination during the recent floods.

Maritimepattu PS is a member of the technical committee, DDMCC, formulated by the DMU. Even prior to the Project District Secretariat, PS and the DMU work in coordination during the disaster relief and rescue operations. Subsequent to the recent floods the coordination with the Survey Department also has improved.

Mannar UC participates in the DDMCC as well as the monthly Divisional meetings. However, the level of collaboration among the UC, DS Office and the DMU requires improvement. Due to separate mandates of these Agencies several issues remain unresolved yet. DMU holds the UC responsible for failure to enforce laws to clear encroachments in the ponds and the drainage network. Earlier there had been 75-80 ponds. Now there are only 15-20 ponds and yet these are being encroached. The DS Office is said to be providing approval for unauthorised constructions due to political influence. They build culverts without consideration to drainage plans. However the UC is hesitant to take legal action due to political interference. Such unauthorised constructions increased the risk of disasters which was beyond the control of the Project. An attempt may be made through the DDMCC to continuously create awareness among the community and the local politicians.

Except in the case of Balangoda, the Project locations under both *Phases I and II* predominantly take a reactive approach where disasters are concerned. Hence more emphasis on disaster preparedness is needed if the Project goal of building sustainable resilient cities is to become a reality. Formulation of systematic work plans in conjunction with the DMU may be considered. Terms of Reference pinning down responsibility on each member of technical teams also needs attention. However it will take a longer duration than anticipated by the Project as it takes time to change the mindset of the political authorities, officials as well as the communities.

3.2.6 Community-based Disaster Response Teams (DRTs)

Communities that actively participate in managing disaster risks and disasters itself have an edge over others to face catastrophes. With the intention of enhancing awareness of disaster risks and resilient capacities of the local communities including women, which is the weakest link in the DRR chain, the Project established Community based *Disaster Response Teams and Rapid Response Teams*. Prior to the Project the communities were not aware of the officials and the Government mechanisms available to provide services.

Phase I

Under *Phase I* of the Project, MARGG was engaged to train and mobilize a network of community based Disaster Response Teams named Lane Committees in several GNDs in the Project locations. It was a well-structured institutional arrangement where community Leaders were identified with the assistance of the GNs and appointed as social animators for a group of around 25 households in a lane. Five (5) of these groups comprising around 125 households networked to setup a Lane Committee. The President and the Secretary were appointed from among the social animators by the committee members.

The Project conducted a Training of Trainers (ToT) programme and trained 4-6 trainers selected from the cities who were capable of training social animators. These trainers trained the social animators. The social animators shared their knowledge with the 25 households. This was the main communication channel setup by the Project to disseminate information with regard to disasters. The Presidents of the Lane Committees were expected to link with the CDPCs at the monthly meeting convened at the Local Authority to resolve issues pertaining to the communities.

The Project also setup Rapid Response Teams (RRTs) consisting of youth, both male and female. The recommended number of members for each team was 15. A five day adventure based residential training programme was conducted to enhance their ability to overcome challenges, and respond quickly and correctly. They were trained in life-saving skills, First Aid, mountain climbing and how to use items such as life jackets and other DRR equipment. Some groups have been trained in swimming. Soft skills such as creativity, community leadership and time management were also built-in to the programme. The participants were highly appreciative as it was an experience they have never had before. The Local Authorities, DMUs and the Lane Committee members were highly appreciative as they would have not been able to organize a training programme of that nature if not for the Project, due to lack of human resources and funding. A parent of a RRT member commented that her son was unable to dress a small wound earlier, but now he is confident in giving artificial respiration.

The responsibilities of Lane Committees and RRTs are early warning of disaster situations to communities threatened by disasters and provision of information to CDPCs, relief supply distribution, coordination and support temporary relief camps, first aid, transport, and village security.

Balangoda UC had established DRTs in two GNDs prior to the Project. MARGG systematized these and extended the geographical coverage to 4 GNDs with 30 Lane Committees. Once in 3 months the Social Animators are called to the UC for awareness building. In addition, the PHI and the DRR Officer visit 25-50 households monthly for awareness building and makes use of these committees to rollout other programmes such as garbage recycling, environment friendly waste water management, Takakura compost preparation, Dengue prevention, Shramadana (voluntary labour campaigns)

> "We make use of the Lane Committees to rollout other UC programmes and prevent the committees going into dormancy"
> *PHI Balangoda*

to clean the village drainage network, etc. Continued engagement in activities helped in preventing the committees going into dormancy.

The Presidents of the Lane Committees in Balangoda link with the CDPCs at the monthly meeting convened at the Local Authority to resolve issues pertaining to the committees. It can be observed that these communities have been somewhat empowered to hold Government mechanisms responsible for provision of services. With the assistance of BUC they have been successful in influencing Ceylon Electricity Board (CEB) to restore a damaged electricity line and replace a bulb in a street lamp, RDA to introduce a pedestrian crossing etc. Utilising the communication channels established through Lane Committees for DRR&P in carrying out other activities have helped to prevent dormancy or discontinuation of the Lane Committees.

In the case of training provided for RRT in Balangoda; although the recommended number in each Team was 15 only around 3 from each Lane Committee altogether 50 have been trained so far from all 4 GNDs. It is planned to increase the trained numbers to 200.

However, the members of the Lane Committees participated in the Evaluation did not seem to be aware of advocacy material on good practices prepared for the broader public audience in the city such as schools, CBOs and local communities.

Ratnapura MC had established DRTs in disaster prone areas after 2003 floods that devastated the city. The DS Office and the DMC also have attempted to form similar committees after 2004 Tsunami however without success, due to poor coordination. After commencement of the Project, Lane Committees had been established in new areas such as Gatangama without consideration to the original teams leaving team members and the MC officials discontent. Thereafter Lane Committees had been expanded to 15 GNDs including the GNDs of the original teams established prior to the Project with the assistance of the MC officials. Appointing trained Social Animators helped to make the Project Lane Committees successful. However, after Project Closure the Lane Committees initially established by the Project in Gatangama seldom takes part in RMC activities or cooperates with RMC officials, for which RMC holds the Project responsible.

The Lane Committee members from other areas were aware that the Gatangama community had been issued life jackets by the project. However, they complained that Gatangama community do not share the items supplied by the DMC during disasters. When inquired by the Evaluation Team, the monks at the Gatangama Temple stated that 30 life jackets had been received by the community. This is a significant adverse impact of the Project that needs to be addressed. Mediation by religious leaders, community leaders and political leadership may be sought to iron out the differences to prevent further discontent and negative effect on the Project.

The rest of the Lane Committees attached to the RMC have been very active. They assist in identifying the disaster prone vulnerable areas. They help in identifying the genuine victims of a disaster. They assist in collecting accurate information on households affected by disasters, loss of assets etc. They help in identifying and prioritizing the victims based on the severity of the losses. They engage in coordinating relief operations in affected areas. They have taken action to relocate the boats closer to the boatman. They assist in cleaning the blocked drainage systems, identifying unauthorized constructions and illegal mining etc. However they were not aware of the Action Projects nor the Pilot Projects implemented in the area and the basis of selection of the locations for the Pilot Projects. The Presidents of the Lane Committees in

Ratnapura link with the CDPCs and participate in the monthly meeting convened at the Local Authority to resolve issues pertaining to the membership.

In the case of ***Batticaloa MC*** area, the Lane Committees had been established by the Project in Thiruchenthur village. The GN in the area had participated in the Training of Trainers conducted by the Project. Later she had trained the Social Animators in the area and formed 25 Lane Committees. The participants of the FGD had been involved with the Project from inception. They have participated in 4-5 meetings including the community mapping sessions which they enjoyed.

However Lane Committees work as a team only in the event of a disaster, usually floods which occur only a few times a year. That too only seven members (3 men and 4 women) were considered to be very active whilst seven more were considered to be somewhat active. The male community also faced cultural issues in having to work with a lady GN. Therefore there is a risk of the committees going into dormancy and dying a natural death if the committees are not reactivated by linking with other village activities.

One RRT had been formed in Batticaloa city. Outbound training had been provided to 5 males and 2 Females altogether 7 from the area. The training had been very satisfactory. In the event of a disaster they move their families to safer locations and engage in rescue and relief operations in the city. The Armed Forces located in the area also support them in rescue operations.

The Lane Committee formed by the ***Kalmunai MC*** is no longer in operation. The area GNs, DS and the Naval Officials help in rescue operations. The members participated in the FGD were neither aware of the Project activities nor the Action Projects identified by the Project. None of them were aware of the Pilot Project implemented by the Project. They have not participated in any of the workshops held by the Project to elicit information required to prepare the DRR&P Plan. They were disgruntled that all the important Projects are implemented in the Muslim DS Division, a longstanding communal dispute triggered due to political differences, however not within the domain of the Project.

In the Tamil DSD, awareness creation programmes on 'DRR and the Role of the communities' had been conducted prior to establishing the Lane Committees. Five (5) persons from each of the 29 GNDs, altogether around 145-150 had participated in this programme. More youth have participated than the adults. 70- 80 participants had been male.

A two day awareness programme had been conducted on Disaster Preparedness and Mitigation. Presentations and short films were used in conducting the Programme. Early warning signals, methods of protecting certificates or important documents for example, 'lamination or safe keeping in polythene bags' were some of the learnings that the participants could recall.

A two day training programme on First Aid had been conducted. St. Johns Ambulance was engaged for the purpose. Films and presentations were used hence it was easy to understand what was taught. Bandaging, how accidents happen, fire injuries, injuries due to falls, injuries due to water, artificial respiration, how to carry the injured, etc. were some of the topics covered. One of the participants in the Evaluation stated that her daughter participated in the first aid training programme but does not take part in any community activities now. Although the participants requested for a certificate it had not been given.

However as the Lane Committees are not functioning the anticipated outcome has not been achieved. No disaster equipment also had been provided to the members. Neither they nor the KMC officials were aware of the details of the DRR related items provided to the Kalmunai community or to whom they have been provided.

Phase II

Under *Phase II*, the Project has proposed Action Projects to enhance community involvement in DRR activities to improve resilience capacity of the vulnerable communities such as creating community awareness on Disaster Risk Reduction and Preparedness and forming community based Disaster Risk Management Committees, improving coordination mechanisms, sharing national and international experiences etc.

The DRR&P Plan of ***Akkaraipattu DSD*** has proposed Action Projects to improve community coordination and awareness and formation of Community Based Disaster Risk Management Committees.

The Project formed a Rapid Response Team (RRT) in Akkaripattu, and provided outbound training to 21 persons from the DS as well as PS areas. They were highly satisfied with the training and gave the highest rating of 5 in a scale of 1-5 for the programme. They made use of their skills, promptly responding in carrying out relief and rescue operations during the recent floods. Earlier no one was trained hence had limited knowledge. Now the Team works systematically hence the community benefit from the services of trained members. Village Disaster Management Committee, Village Civil Defense Committee (Grama arakshaka), Mosque Committee joined the RRT in disaster relief operations. The RRT members felt that the corporation of the community was much greater after commencement of the Project. However WRDS does not participate due to cultural reasons inherent to the local community.

> "We are highly satisfied with the outbound training programme. We made use of our skills in relief and rescue operations during the recent floods"
> *Participants from Akkaraipattu*

The trained team has sufficient knowledge in making a raft. However they need more resources such as raincoats, mamoties, shovels, umbrellas, tents, temporary shelter, mats, bed sheets, pillows a first aid box etc. The safety items from the DMC such as life jackets were received after the unexpected floods.

As the population in the area is over 45,000, the RRT members appreciate if the training could be extended to atleast 100 persons. They do not have the resources to do so on their own. Some of the participants were of the view that it would be beneficial to form smaller committees that are manageable such as Lane Committees and provided training so that the entire community in all risk and high risk areas could be reached. As proposed in the Action Projects, the MC may formulate Community Based Disaster Risk Management Committees (CBDRMC). The MC can take a further step and link CBDRMC to the Village Disaster Management Committee of the DMU and the technical committee established by the MC for the communities to be better prepared for disasters. It may be useful to have written guidelines for these committees so that the new members can be oriented from time to time and are aware of the role expected of them. They would also like to have an Identity Card from the Local Authorities which will be useful during search and rescue operations.

For ***Vavuniya UDA area***, the DRR&P Plan has proposed awareness creation programmes on DRR&P and formation of Community Based Disaster Risk Management Committees in the entire Vavuniya UC area under the Action Project; 'Sharing and participating in community actions and improving resilience through social empowerment.'

In Vavuniya, DM Unit of the DMC had formed GND level Disaster Management Committees in 102 GNDs prior to the Project. Each committee consists of 25 members. The GN has been appointed as the Secretary to the Committee. Sub-committees in charge of early warning, health, disaster relief, search and rescue operations and reconstruction also have been formed. They have been trained by the DMU in early warning, first aid and search and rescue operations prior to the Project. DMU has also carried out mock drills on disaster management prioritizing communities in rural areas that cannot be easily accessed by city rescue teams during disasters. The members are in possession of community contact numbers. In addition to the committee members school teachers, principals, youth and school volunteers, PHI etc., have been provided training and awareness by DMU on responding to a disaster.

Altogether 14 members including three from the DMU have participated in the outbound training programme conducted by the Project for Disaster Management Committees. A participant from Thirunavakulam stated that although not linked with the DMU or the UC he made use of the skills and helped the victims together with members of youth clubs and local politicians during the recent floods. One of the participants stated that he has confidence in taking leadership anywhere any time. The participants interacted in the evaluation were highly satisfied with the programme. They gave 4.5 marks in a scale of 1-5 and stated 0.5 marks were reduced as no training was provided in swimming.

Several Action Projects have been proposed for ***Maritimepattu PS area*** to enhance community resilience such as Community awareness on DRR&P that reach the entire community, Educating school children, GIS training for local officials, Formation of Community Based Disaster Risk Management Committees, Formation of youth response and post-recovery teams and Drought forecasting and early warning communication network.

DMU has formed Community based Disaster Management Committees at GN level with at-least 15 members in each GND. These Committees work on a voluntary basis and are activated during the disasters. DMU also assists Zonal Education office to form School Disaster Management Committees. Periodically DMU carries out mock drills on disaster management for floods and Tsunami. Twenty (20) participants including five (5) women were selected by the GN and the DS from the Youth Clubs and the community for the outbound training programme conducted by the Project. The participants stated that they are 100% satisfied with the programme and gave 5 marks in a scale of 1-5.

PS has its own equipment such as chainsaws, water pumps, and fire extinguishers. The DMU has provided life jackets, gum boots, a loudspeaker, and ropes for search and rescue operations. The equipment supplied by the Project helped in carrying out rescue and relief operations. The participants are confident in facing disasters now.

Several Action Projects have been proposed for ***Mannar DSD area*** such as community capacity development to ensure preparedness is prioritized; establish a resilient health service system to improve the capacity of the health services during disasters by improving the capacity of the hospitals, carrying out programmes to control post-disaster diseases and establish mobile health services.

DMU has formed Community based Disaster Management Committees at GN level with around 25-30 members in each GND. These Committees work on a voluntary basis and are activated during the disasters. DMU also assists Zonal Education office to form School Disaster Management Committees. Periodically DMC carries out mock drills on disaster management for

floods and Tsunami. However, though the GN together with CCD and UDA Officials had been included in the technical committee formed by UOM for hazard mapping, they have not had discussions with the Disaster Management Committee members. Hence despite the GN being there, the DMU feels that there is a possibility that UOM may have missed out on vital information from grassroots level needed for preparation of the plan.

Twenty (20) participants from UC, DS Office, DMC and community including five (5) women were selected by the GN and the DS from the Youth Clubs and the community for the outbound training programme conducted by the Project. The participants were highly appreciative as it was the first time they have taken part in such a programme. They are confidant in facing the challenges during a disaster now, hence gave a rating of 5 in a scale of 1-5.

However, it is observed that by and large the committees in all locations whether Project based or DMU based except Balangoda had been engaged in disaster and post disaster activities. Focus on disaster risk reduction and preparedness seems insufficient. Therefore more attention is needed in taking a preventive approach. However it takes time to change the mindset hence may take a longer period than originally expected by the Project.

Notwithstanding, the collective effort made to achieve a common goal without reinventing the wheel, in this case to strengthen the DMU and the Disaster Management Committee can be recognized as a good practice and the benefits of improved resilience capacity will accrue to a much larger segment of the community.

The DRR&P Plans have proposed Action Projects to establish ***community disaster funds***, ***insurance schemes*** etc. at local level. However feasibility of such mechanisms needs to be studied further as it is not known how many families can afford to absorb the financial burdens attached to such schemes. Some of the Lane Committee members found it difficult to incur transport and communication costs in carrying out DRR responsibilities. In any event the Local Authorities need to make the public well aware of the advantages as well as disadvantages well in advance of implementation of the plans.

3.2.7 School Based Capacity Building Programme

Educating school children is an effective means of reaching a larger segment of the community as they transmit the message effectively to the adult community. For the purpose of disseminating DRR communications at school level, during *Phase I,* the Project rejuvenated the Environment Societies in secondary schools established by the Local Authorities. Several awareness programmes were conducted in schools to improve resilience capacity.

In *Phase II* locations they leaped forward to organize competitions among schools through the Ministry of Education. The students were requested to identify vulnerabilities in their locality and submit project proposals to mitigate the effects of the hazards. Around 10-12 schools applied from each Project location. The children from each school made a presentation for about 20 minutes to an independent panel of judges including DMU representatives, who selected the winners. Three prizes amounting to SLRs 100,000/-, 50,000/- and 25,000/- respectively were awarded to the three (3) schools that submitted the best proposals. The students were provided certificates and t-shirts. The project agreed to award funds amounting to SLRs 1 million for the winning school to implement their community project.

The children walked through the village, visiting from house to house to identify the priority issues and mapped the vulnerable locations. They talked to the GN, members of the RDSs, senior citizens and the residents to research on vulnerabilities in the area and the causes of the

hazards. They inquired on the present action taken to mitigate such issues. The community was gathered to prioritise the project to be implemented. Thereafter they designed suitable proposals to resolve the issues.

The children from the award winning school in ***Vavuniya*** selected Thandikulam as the area most vulnerable to disasters. The major hazards affecting the village were identified as floods and drought. During the floods the villagers were evacuated to safer areas until the water recede. The children called a community meeting to identify the disasters and prioritise the issues based on the vulnerabilities. Seasonal calendars were prepared with the guidance of the teachers. Fifty three (53), 39 men and 14 women participated at this meeting. The adult community was very keen as the project was to be implemented by children. The award winning school proposed to build a culvert for the village. In addition they requested a generator as the drains were not visible in the dark during floods. Several have been injured by falling into drains and even caused a death.

However, it was difficult for the children to implement the winning proposal due to the inability in clearing the unauthorized encroachments in the area. Therefore DRR related equipment had been provided including the generator, 30 lights, 2 speakers, microphone, and 2 water tanks to be used during the drought period. The DMU officers expressed satisfaction that the relationships with schools have improved and that it is easier to coordinate school based DRR prgrammes now.

After the 2004 Tsunami, there was salinity in water in the Nayar River in Mullaitivu. The award winning school children in ***Maritimepattu*** submitted a project proposal to provide drinking water to 48 selected families out 350, within a one kilometer radius. The children produced a documentary, designed and printed stickers to give publicity to the Project. They built replicas of the project village depicting past, present and future situation.

The children were so happy that they won the competition and shared the news with the vulnerable community. However the wining proposal could not be implemented prior to UN-Habitat Project Exit due to the monsoonal rains. Instead the school was provided with DRR equipment, that too different from what they requested for. They had requested for water tanks, tap line etc. but they have been provided with fire extinguishers, generator, water pump, electronic bell etc. The vulnerable community has had many expectations with regard to the project as it was the first time a project had been proposed to provide them drinking water. They were disgruntled as it did not materialize. Whenever the children pass the village they make inquiries about the project. The children were very disappointed and embarrassed.


We were so…….. happy

GN of Tholvupadu GND who had close links with the school programme in ***Mannar*** commended the concept to identify projects to address community issues by children rather than by senior officials, which was new to the locality. The winning entry of the school was to restore a section of the drainage as it costs SLRs 30,000/- per annum to mitigate floods. However implementation was delayed due to the monsoonal rains and the Project had donated equipment such as a Generator, water tanks, temporary sheds, plastic chairs, and large kitchen utensils to be used during relief activities. The announcing system is to be provided. The GN was happy that 580 families in his GND will benefit from these items.

"Identification of Projects to address community issues by children rather than by senior officials was a new concept."
GN – Tholvupadu, Mannar

The children interacted in the Evaluation attributed their improved leadership and organizing skills to the project. They have been happy that they won the competition. However the children in Maritimepattu and Mannar were disappointed that they were unable to complete the community projects. The local communities have lost confidence in the children.

Future Projects may consider setting aside funds or in the alternate extend the Project duration to prevent such disappointments.

3.3 Efficiency

The Project did not seem to have impediments in selecting the vulnerable project locations which were considered to be lagging Provinces. The selected areas have been declared by the UDA hence have a potential for urban growth. They did not have approved development plans and land use plans, were vulnerable to multiple disasters and having low socio-economic standards. Balangoda UC believes that the representations made by them at international forums with their action plans and the award winning good management practices gave them an edge over others in being considered as a Project beneficiary.

The comprehensive baseline study, vulnerability and risk assessments together with the SWOT analysis helped in further endorsing the selection of locations. Consideration of the elements of the Hyogo Framework for Action has helped in taking a holistic approach in developing strategic and systematic set of plans to reduce vulnerabilities, risks and hazards in the selected areas.

Efficiency in documentation, data collection and recording in relation to DRR&P Plans by UOM was highly satisfactory.

Selection of Councils with political will and strong commitment to implement the activities contributed to efficient implementation of the Project in majority of the locations. However it was observed that Kalmunai MC faces constraints like extremely high population density, high rate of encroachments on sensitive environs and political leadership's unwillingness to adhere to guidelines in implementing the UDA regulated Zoning Plan/ DRR&P Plan. In Mannar, the level of collaboration among the UC, DS Office and the DMU requires improvement. Unauthorised constructions are being approved by the DS Office yet due to political pressure increasing the risk of disasters.

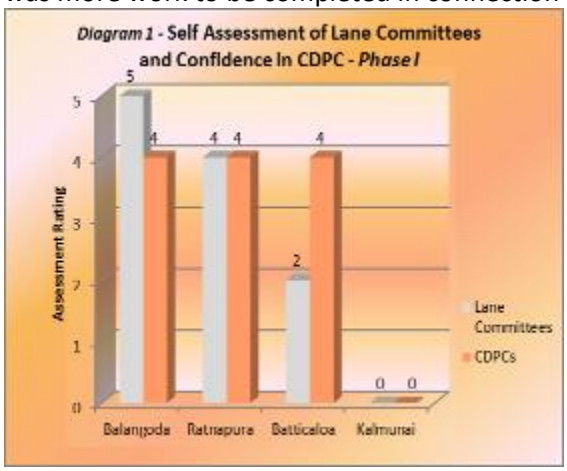
Community participation from inception; in issues identification, problem analysis, identification of locations, hazard mapping for GNDs, identification of level of community response to disasters, identification of suitable representatives for community response teams, validation by public and implementation of selected Action Projects helped in preventing undue delays in execution due to community concerns.

> "Well functioning Lane Committees were a milestone achieved by the Project."
> *Lane Committee Members in Balangoda and Ratnapura*

Capacity building and community empowerment programmes for improving the capacities and reducing the vulnerability from natural hazards conducted for Lane Committees and RRTs were well appreciated. The communities in all except Kalmunai considered that well-functioning Lane Committees were a milestone achieved by the Project.

On the request to assess their own role in relation to efficiency and competency on a Likert scale of 1 -5, all Lane Committee members of ***Balangoda UC*** who participated in the Evaluation

placed a significant appreciation of their role in the society by giving the highest ratings of 5. They were highly satisfied and gave a rating of 4 for CDPCs as the members were easily approachable. The cordial relationship helped in implementation of project activities. However one mark was reduced as although CDPC members actively participate in Project activities, there was more work to be completed in connection with DRR&P.

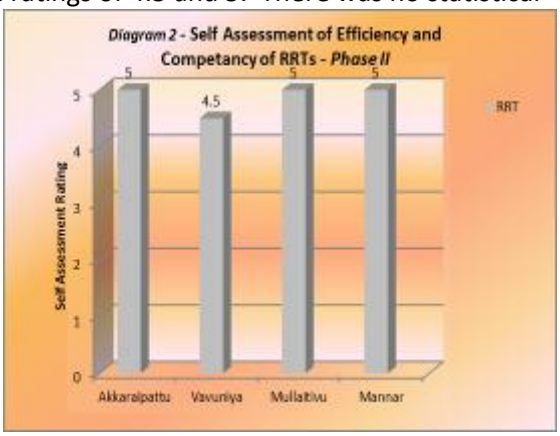


There was no statistical variation between the self-assessment of the members of the Lane Committees who participated in the Evaluation in ***Ratnapura MC*** and the ratings given by them for confidence in CDPCs role in the society. Both were given a high rating of 4. One mark was reduced as not all members appointed are sufficiently active in the committees.

However Lane Committee members in ***Batticaloa MC*** area gave a low rating of 2 for the performance of their Committees when the entire committee was considered as only 14 of their members actively participated in DRR related activities out of whom only 7 members were considered to be very active. However they gave a higher rating of 3 for the performance of the active 14 members. They were not aware of the CDPCs but gave a rating of 4 for the GN, MC Commissioner and his team.

The Lane Committee formed by the ***Kalmunai MC*** is no longer in operation. They were unaware of any of the CDPCs and the Action Projects carried out by the Project. Therefore they refrained from giving a rating.

RRT participants in all *Phase II* locations placed a significant appreciation of their efficiency and competency on a Likert scale of 1-5 by giving high ratings of 4.5 and 5. There was no statistical variation between the RRT participants in Akkaraipattu, Mullaitivu (Maritimepattu) and Mannar. They were highly satisfied with the training and gave the highest rating of 5 in a scale of 1-5 for the programme. Akkaraipattu RRT members made use of their skills, promptly responding in carrying out relief and rescue operations during the recent floods. Mullaitivu participants stated that they were 100% satisfied with the programme. The participants in Mannar are confidant in facing the challenges during a disaster now. Vavuniya RRT gave 4.5 marks and stated 0.5 marks were reduced as no training was provided in swimming.



Training and Awareness Creation programmes for building contractors and craftsman were commended for the high quality of programmes and the participants expressed that the programmes helped them to learn a subject that they were not privy before. These programmes had been very informative and appreciated by the participants. The participants attributed the knowledge gained to the simple, interactive methods of visual presentations in local languages using examples which were easy to comprehend. They appreciated the engagement of subject specialists as resource persons.

"The knowledge we gained from special training in new construction practices and guidelines incorporating DRR features helped not only to change the construction practices but also to enhance productivity"
Building Craftsman

The building craftsman specifically mentioned that the knowledge they gained from special training in new construction practices and guidelines incorporating DRR features helped not only to change the construction practices but also to enhance productivity. Nevertheless if the expected level of resilience is to be achieved the reach has to be increased. Lane committees and Rapid Response Teams will have to be established in all disaster prone areas in the respective townships and trained as appropriate. More craftsmen will have to be trained in construction practices with DRR features.

The Officials interacted with the Evaluation Team in Batticaloa MC, a *Phase I* loacation stated that there were a few delays in Project implementation. The Pilot Project had not been transferred to the public even at the time the Evaluation Team visited the field site.

Under *Phase II*, the Project has been successful in completing the implementation of planned activities during the relatively short project duration of one year except the core activity of the school based programme. It had not been possible to complete implementation of the winning school community project which left many children disappointed and the potential beneficiary communities discontented although equipment had been provided covering the value of the activity. Future Projects may consider alternate funding arrangements to set aside funds or in the alternate to extend the Project duration to prevent such disappointments.

All eight Project locations appreciated the funds provided for the Pilot Projects. The respective local Authorities and the Partners were satisfied that the agreed amounts of funds were received by them. However, there had been occasional delays in receipt of funds. UOM used University funds when there was such delays hence implementation work were not interrupted. The communities were well aware of UN-Habitat. However the levels of awareness amongst communities regarding the contribution of the funding partner, AUSAID seem to be inadequate despite sign boards being erected in most of the demonstration Project sites. More awareness building during planning and implementation phases may have helped.

The funds were used for initially intended purpose except in the case of Batticaloa where there was an excess of Rs 500 K due to safe margins in expenditure provisions. These funds were later utilized towards printing the DRR&P Reports by the UOM. There was an excess amount of Rs 33 K in Mannar UC which had not been utilized to date.

The Project was able to advocate introduction of new Budget lines in two Local Authorities during *Phase I*; Disaster Risk Reduction and Climate Change Account in Balangoda UC and Disaster Risk Reduction and Environment Management Account in Ratnapura MC which can be considered as major achievements. RMC had allocated SLRs 1mn for financial year 2014 for DRR purposes. BUC had allocated SLRs 250 K each for Disaster Preparedness, Risk reduction, Relief and Climate Change.

Although Batticaloa MC has no separate budget line, they had allocated SLRs 1mn for DRR purposes in the Physical Planning budget line whilst Kalmunai MC had allocated a lump-sum of SLRs 500 K in the Social Welfare budget line for the same period. However these funds were used for disaster emergency response, rescue activities and relief work.

In the case of *Phase II*, a new budget line for Public Assistance for Disaster Account was introduced in Akkaraipattu MC with an allocation of SLRs 1 million for 2014. Additional

allocations were made in Maintenance Budgets in Vavuniya UC in 2014 amounting to SLRs 200K. However in Mannar UC and Maritimepattu PS, no allocations were made. The Finance Committee approved a supplementary budget in case of a disaster.

Therefore despite there is a priority need, the Government funding is not sufficient to finance Action Projects identified.

The Project has provided all eight (8) locations under *Phases I and II* with a computer, printer, UPS, Global Positioning System (GPS) used for mapping and furniture; tables, chairs and a cupboard needed to run a DRR Unit efficiently in the respective Local Authorities.

Distribution of DRR Equipment

Balangoda UC and Ratnapura MC have been provided with lifejackets, boots, ropes needed for rescue operations. RMC stated that Radio Equipment had been provided only to two locations though 4 numbers had been agreed to. However they expressed their disappointment that the Equipment were installed in these two locations without notifying the MC. Hence the MC has no inventory with regard to these equipment.

The community participating in the FGD in Batticaloa MC area were aware of Radio Equipment provided to two 2 locations in Batticaloa. They were of the view that Radio Equipment needs to be installed in the nearby Kovil as they already have a speaker system hence can easily make public announcements. They stated that the Project had agreed to provide safety jackets, goggles, torches, ropes, belts, and a boat however had no idea whether the items have been provided. The BMC had tried to locate these items during the recent floods but of no avail. They were of the view that the distribution of public property should have been through the MC to be used for the benefit of the majority.

The Project had agreed to provide 5 base stations for Mannar. However at the time the Evaluation Team visited, the base stations had not been received.

Based on the Project statistics, under *Phase I*, the Project has provided 4 repeater stations, 4 VHF base stations, 30 hand held's, 4 Public Address (PA) systems, 8 hand sirens, 20 mega phones, 200 gumboots, 500 life jackets, 8 chain saws, 20 emergency lamps, 4 temporary shelters, visibility tools etc. to the communities in the four project locations Balangoda, Ratnapura, Batticaloa and Kalmunai through the DMC.

Based on the information provided by the DMC, 200 life jackets, 200 pairs of gumboots, 4 bundles 220m rescue rope, 4 Chain Saws, 4 PA systems, 8 hand sirens, 16 VHF Base Stations and 2 repeater stations were provided to the four Project locations Akkaraipattu, Vavuniya, Mullaitivu and Mannar *Under Phase II* of the Project.

It may have been more beneficial for the Project to supply the DRR equipment in coordination, consensus and concurrence with the Local Authorities to prevent discontent. If they could have been traced there would have been greater ownership of the supplies whilst being able to pin down responsibility to the LAs to replace or repair the items as the community is unable to do so, on their own due to lack of resources. Whenever the need arises the communities in possession of the items could have shared atleast some of the items with the areas affected by the disasters distributing the benefits of limited resources among a wider segment of the community.

The Project may follow-up with all locations and confirm whether the DRR equipment/ items have in-fact been installed by DMC or provided to the beneficiaries as the Local Authorities have no inventory of the items handed over to the community nor did the community interacted in the Evaluation seem to be aware of the numbers provided to them by the DMC. Many could not even recall what items had been provided to them.

3.4 Impact

3.4.1 Impact of Demonstration Projects to Local Authorities and Other Government Agencies

UDA has prepared the draft Development Plans by following the planning process introduced by the Project. The Hazard Maps introduced by the DRR&P Plan have been incorporated to the draft Development Plans. Further the Action Projects identified in the DRR&P Plan which are relevant to Local Authority areas have also been incorporated in *Phase I* locations and are in the process of being incorporated in *Phase II* locations.

Once the amended Development Plans are re-gazetted, the Local Authorities have the power to implement and monitor the Plan and the projects as the UDA has delegated its planning powers of the declared urban areas as per the UDA Law.

> "The DRR&P plans are very useful. The Local Authorities are unable to accomplish such an endeavor with advanced technology due to lack of resources."
> *Officials of Local Authorities*

The Officials of the Local Authorities considered the DRR&P Plan to be very useful as they would have not been able to accomplish such an endeavor with advanced technology on their own due to lack of resources. Some were of the view that even the Disaster Management Units do not have such comprehensive plans for these areas. This fact was confirmed by the Disaster Relief Officer of Mullaitivu. The Local Authorities such as Balangoda, Batticaloa and Mannar are already making use of it as a tool for fund raising purposes.

However the DMU of Mannar was of the view that, had there been a separate plan for the Mannar UC area, instead of a combined plan for UC as well as the PS areas it could have been more beneficial for administrative purposes. Prior to the Project the Department of Coast Conservation in Mannar had no hazard maps. Now the decision making has been made easier due to the maps provided in the DRR&P Plan. The GN in Mannar was very happy that the Project had provided him hazard maps which he considered very important in his DRR related work as well as day to day activities, an unintended benefit of the Project. Future Projects may consider sharing information generated for Project purposes with local officers concerned if it helps in enhancing efficiency in discharging their duties and responsibilities. Benefits from such endeavors would accrue to a larger segment of the population in and outside the realm of the Project. If action is taken to display these maps in the Local Authorities or offices of officials working at the grassroots level such as GNs, it would help to enhance public awareness and trigger shifting the mindset of the communities towards disaster preparedness.

However the DMU in Mannar was disappointed that though agreed the Project had inadvertently omitted indicating the locations of community level early warning systems installed by them prior to commencement of the Project. Had this information been available, it would have been easier to select the most appropriate location to install the early warning system to be provided by the Project. Although not in the Project mandate due consideration may be given to needs identified in the field particularly if the benefits accrued are greater than the anticipated costs.

It may be good to share the hazard risk maps and connected information with relevant Government Agencies such as the Central Environmental Authority, Gem and Jewelry Board and Divisional Secretariats, which are involved in local land use activities. Currently they base decisions on their individual capacities.

3.4.2 Developments in the Local Authorities since Commencement of the Project

Since commencement of the Project the Local Authorities give special focus to Disaster Risk Reduction and Preparedness. In order to implement DRR&P Plans the Local authorities took Council decisions or adopted resolutions when the Council was dissolved; a major achievement of the Project. Accordingly the following developments took place in the Project locations:

Phase I

- Disaster Preparedness Planning Process commenced and new budget line for Disaster Risk Reduction was introduced in Balangoda UC and Ratnapura MC
- Additional allocations were made in the Physical Planning budget line in Batticaloa MC and in Social Welfare budget line in Kalmunai MC for Disaster Risk Reduction
- Standing Committee was appointed at MC level for Disaster Risk Reduction in Ratnapura MC
- Technical Advisory Committees were formed in Batticaloa and Kalmunai MCs to predominantly focus on DRR related issues and to make proposals to the Council/ Municipal Commissioner
- City Disaster Preparedness Committees (CDPC - a Technical Working Group) were established in Balngoda UC and Ratnapura MC
- DRR Units were established in the Local Authorities; Balngoda UC, Ratnapura and Batticaloa MCs with staff. Kalmunai MC has established a unit and is working towards streamlining it.

Phase II

- New budget line for Disaster Risk Reduction was introduced in Akkaraipattu MC. Additional allocations were made in Maintenance Budgets in Vavuniya UC in 2014. In Mannar UC and Maritimepattu PS, Finance Committee approves a supplementary budget in case of a disaster. However, Vavuniya UC has discontinued budget allocations hence will have to resort to a supplementary budget from 2015
- Standing Committee at MC level was appointed in Akkaraipattu MC for Disaster Risk Reduction
- Technical Working Group was established at Local Authority level in Akkaraipattu (members comprise Local Authority Council members, representatives from DMC, UDA, and other government and non-government officers working in the area)
- Technical Guidelines were prepared for mainstreaming DRR into Development Planning Process of Urban Development Authority. The Guidelines were approved by the planning committee of the UDA. Currently UDA is in the process of preparing the Development Plan by incorporating DRR elements
- DRR Units were established in the Local Authorities:
  Akkaraipattu MC has a functional DRR Unit with designated, trained staff
  Vavuniya UC has established a Unit for DRR, with designated staff
  Maritimepattu PS has a functional DRR Unit with trained Maintenance Staff in-charge
  Mannar UC is working to establish a DRR Unit

During the recent floods experienced in six Project locations; Ratnapura, Batticaloa, Akkaripattu, Vavuniya and Mullaitivu, the Local Authorities have effectively collaborated with other stake holder agencies and affected community groups in carrying out relief and evacuation activities. All these Local Authorities attributed improved coordination to the Project. Earlier different agencies acted upon their own mandates during such catastrophes. However in Mannar, the level of collaboration of UC with Divisional Secretariat and the DMC requires improvement.

3.4.3 Impact of Disaster Mitigation Pilot Projects

Phase I

Pilot projects in *Phase I* were selected for implementation based on the DRR&P and Urban Development Plans. Frequency of the occurrence of hazards and their magnitude was considered in selection.

(i) Balangoda UC

The Project proposed several Action Projects for Balangoda UC out of which the community prioritised the projects in connection with storm water management plan for flood risk reduction to be implemented as a pilot to prevent the city from flooding:

- Dorawela Oya rehabilitation and urban flood mitigation project
- Rehabilitation of storm and waste water drainage in the Town
- Rehabilitation of road drainage

Environmental Impact of the Action Projects Implemented:

The two action projects undertaken within Balangoda UC area together with the major environmental impacts are tabulated in tables 5, 6 and 7 as follows:

Major environmental impacts of Dorawela Oya rehabilitation and urban flood mitigation Action Project:

Table 5	Features		
Environmental Impact	Type	Local effect	Regional effect
Physical Environment			
Soil erosion control	+	Significant	Insignificant
River bank collapse reducing	+	Significant	Insignificant
Water pollution control	+	Significant	Less significant
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Biological Environment	Insignificant		
Social Environment			
Ensure traditional uses/ access	+	Significant	Insignificant
Reduced health hazards	+	Significant	Insignificant
Improve recreation for public	+	Significant	Insignificant
Built infrastructures protection	+	Significant	Insignificant
Compliance with regulations	+	Significant	Insignificant

The constructional phase impacts are insignificant due to the micro scale of the work. Sourcing of building material does not cause significant impacts since their sources are away from the Project locality. Construction process including ground preparation and material handling also remain insignificant.

Dorawela linear park, a green belt with stream bank protection structures

The findings in table 4 indicate that the construction brings positive impacts upon physical and social environments whilst neutral upon biological element. The photographic survey findings show these positive impacts. This also complies with riverine reservation requirements of Divisional Secretariat and Department of Irrigation.

However, the impacts limit to the local level context except on regional water quality, which is likely to be improved with reduced suspended sediment load reducing downstream siltation as well as at regional level.

This mitigation measure has provided an appropriate and a sustainable solution addressing a community concern. The solution is effective for reducing the flood and landslide risks. It ensured access for traditional uses; the Evaluation Team interacted with families enjoying their evening bath who were appreciative of the Project. However, the communities closer to the town area were concerned that BUC does not collect garbage regularly hence there is a risk of garbage being disposed to the waterway (Dorawala Oya) by the community, particularly from the boutiques along the waterway causing Environmental and Social issues including floods.


Dorawela Oya, collapsing river bank

For ensuring the long term sustainability of the solution, it is proposed to introduce a Public-Private (BUC-Community groups or Institutional) partnership approach for maintaining the rehabilitated river bank, instead of undertaking sole responsibility by the BUC.

This pilot scale model confirms ability to replicate same along "Dorawela Oya" and other water ways, with disaster risks. Both the stake holder Agencies and the vulnerable community groups also emphasized this need during the discussion.

Table 6 depicts Major impacts of rehabilitation of storm and waste water drainage in the Town:

Table 6	**Features**		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Soil erosion control	+	Significant	Insignificant
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Biological Environment	Insignificant		
Social Environment			
Reduced health hazards	+	Significant	Insignificant
Reduce nuisance by foul odour	+	Significant	Insignificant
Built infrastructures protection	+	Significant	Insignificant
Compliance with regulations	+	Significant	Insignificant

Note: Construction impacts are insignificant, thus not mentioned.

The close topped drainage built as the action project, brings city shop buildings borne effluent (grey water) and surface runoff in to Dorawela Oya. The top being closed increases safety, drainage efficiency and clean environs.

Construction brings positive impacts confirming the appropriateness of solution to reduce floods and health hazards due to stagnating waters in the local context. Stake holders and Community consultations confirmed effectiveness of this during recent floods. Thus the Action Project is environmentally sustainable.

Nevertheless, educating city shop building owners to prevent from disposing solids and gradually introducing treatment units to discharge treated effluent will enhance the long term sustainability. Furthermore, improving the drainage outfall to Dorawela Oya will enhance its effectiveness and efficiency in overall disaster risk reduction. However BUC needs to attend to garbage collection regularly so that it will not be dumped in the waterway.

Table 7: Major impacts of rehabilitation of road drainage at Hunukumbura in Kirindigala GND:

Table 7	**Features**		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Soil erosion	-	Significant	Insignificant
Natural drainage blockage	-	Significant	Insignificant
Built drainage blockage	-	Significant	Insignificant
Biological Environment	Insignificant		
Social Environment			
Storm water runoff road drain	+	Significant	Insignificant
Increased health hazards	-	Significant	Insignificant
Damage to the access road	-	Significant	Insignificant

Note: Construction impacts are insignificant, thus not mentioned.

This is a road drain construction, which has not been completed as per the plan due to an underlying rock, requiring additional funds for removal exceeding the allocated budget.

The site Evaluation findings indicate adverse impacts caused by the incomplete construction. The local community previously susceptible to moderate floods by hill side storm water runoff was disgruntled due to multiple hazards; increased floods with excessive erosion and water stagnation leading to health hazards such as dengue, after construction. The community complained that the leveling of the drain was faulty, a cause for water stagnation. This drain had been constructed by the RDS in view of empowering the rural community. Future Projects may engage the MC Engineering Team for supervision of such projects due to limitation in community knowhow and construction facilities. The community had made written representations to the UC during construction, but to no avail.

Compound erosion risking the house collapse by spilling off the road drain

The BUC emphasized that the original road drain construction plan and the budget estimate had been revised to suite the ground conditions and confirmed that with due completion of the work the series of hazards caused by storm water runoff would be completely solved. This corrective action is expected to bring all 'negative impacts' shown in Table to be 'positive', thus Action Project will be a successful exercise. Promoting empowerment of the RDS is a good initiative however due consideration should be given to provide expert advice to prevent adverse social impact. Hence the rectification process needs to be expedited to prevent further inconvenience and the resultant negative impact on the Project.

The Action Project is relevant and appropriate to reduce the flood risk whereas inadequacy of technical feasibility assessment and community participation has led it to be ineffective. If these issues can be rectified it can be used as a replicable pilot model for building own Drainage Network by the community.

Following are some proposals for implementing the overall drainage network construction in future, to prevent repetition of similar failures ensuring the effectiveness and sustainability:

- Undertake a ground survey (record natural drainage and geophysical settings) to produce construction drawing
- On site community consultation to verify their needs in the local context
- On site community participation during implementation phase to prevent inconvenience caused due to damages to private property (excessive erosion in private land) and the resultant negative impact on the Project
- Strengthen community participation (eg Lane Committees) for monitoring and maintenance

Social Impact

The members of the Lane Committees confirmed that flooding in the Dorawela Pilot Project area has reduced. They believe that if the project is completed the flood risk will minimize. However they were not familiar with the drainage rehabilitation projects.

Prior to the Project there was no system in place to manage the disasters. Now the communities take an active role in prevention or reducing the effects of disasters. They are able to take swift action during disasters. They attributed active community participation during and after disasters, their increased knowledge in identifying risks, their ability to assist in reducing the impact of disasters and awareness in recovering from the effects of disasters, to the Project.

The communities are now increasingly becoming environment friendly after commencement of the Project, though somewhat limited to Project locations. They give importance to garbage disposal. BUC has introduced a garbage recycling programme where the community has the opportunity to generate an income. As a result the incidence of epidemics has reduced. The communities also take an active role in beautification of the city.

(ii) Ratnapura MC

As floods have been the priority community concern, the following drainage constructions have been implemented as Pilot Projects:

- Pattiyaowita storm water drainage construction 300 feet in length
- Muwagama storm water drainage construction 500 feet in length
- Gatangama, Mudduwa storm water drainage construction 300 feet in length

However, though several Action Projects have been identified in the DRR&P Plan to empower protection of the environment, the evaluation findings indicate that conservation of the unique ecosystem in 'Pompe Kele,' where a 'Relic ant' exist has been overlooked, probably due to inadequate attention paid to this issue by the community and the MC. The Project may communicate the importance of such activities to the authorities concerned and initiate action.

Environmental Impact of the Action Projects Implemented:

The three action projects undertaken within Ratnapura MC area are tabulated in tables 8, 9 and 10 as follows:

Major environmental impacts of Pattiyaowita storm water drainage construction Action Project is depicted in *Table 8*:

Table 8	**Features**		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Soil erosion control	+	Significant	Insignificant
Water pollution control	+	Significant	Insignificant
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Biological Environment	Insignificant		
Social Environment			
Reduced health hazards	+	Significant	Insignificant
Reduced nuisance from foul smell	0	Significant	Insignificant
Built infrastructures protection	+	Significant	Insignificant
Ensured traditional land uses	+	Significant	Insignificant
Comply with regulations	+	Significant	Insignificant


The concrete drain preventing inundation of access and compounds

The constructional phase impacts are insignificant due to the micro scale of the work. Sourcing of building material does not cause significant impacts since their sources are away from the Project locality. Construction process including ground preparation and material handling also remain insignificant.

The findings in *Table 8* lead to conclude that the construction brings positive impacts upon the physical environment whilst neutral upon the biological element. Particularly the concrete walls reduce mixing grey water and vehicle service station borne industrial effluents into the drain. The photographic survey findings show these positive impacts. Oerall the social environmental impacts of the project are positive as per the *Table 8.* The drain reduces water stagnation reducing possible health hazard risks and protects the road from severe erosion. The construction protects use of access road and associated land uses as well.


The closed top ensuring access but discharging point causing foul smell

Nevertheless, impact from 'foul smell' receives '0' since the community living near the discharge point expressed their displeasure as they suffer from foul odour at higher intensity, whilst giving relief to community living along the drain path. Removal of obstruction on the receiving main-built drain will redress the affected party bringing Project impacts to be entirely positive. However, the community stated that the MC has not taken steps to rectify the situation to date despite complaints made during construction phase. The MC needs to expedite corrective action to prevent inconvenience caused to public and the negative impact on the Project even though it is a micro scale Project, and the impacts are limited to the local context.

This mitigation measure has provided an appropriate and a sustainable solution addressing a community concern. The solution is effective for reducing the flood risks. For ensuring the long term sustainability of the solution, it is proposed to undertake further minor improvements in consultation with local community to eliminate negative effects. Furthermore following will enhance effectiveness and sustainability of the Project:

- Establish a Public (Local Authority)-Private (Community groups or Institute) partnership approach for proper maintenance,
- Erect notice boards guiding community to refrain from littering or obstructing the built drain
- Guide city venders and semi-industrial operators to purify Grey water and Industrial effluent prior to discharge into drains
- Strengthen local community participation in Project planning and implementation

This pilot scale model implies that the same methodology with aforementioned improvements is applicable for City Drainage network construction. However, macro scale construction should essentially be coupled with scaled up Technical, Financial, Ecological and Community interventions compared to this micro scale Project. This is duly recognised in the DRR plan as well.

Major environmental impacts of Muwagama storm water drainage construction Action Project:

Table 9	Features		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Soil erosion control	+	Significant	Insignificant
Water pollution control	+	Significant	Less significant
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Biological Environment	Insignificant		
Social Environment			
Reduced floods	+	Significant	Insignificant
Reduced health hazards	+	Significant	Insignificant
Ensured traditional land uses	+	Significant	Insignificant
Built infrastructures protection	+	Significant	Insignificant
Comply with regulations	+	Significant	Insignificant

Note: Construction impacts are insignificant, thus not mentioned

The storm water drainage built, connecting the roadside drains brings surface runoff drains from Vass area into the river 'Kalu ganga'. Construction generates overall positive impacts confirming the appropriateness of solution to reduce floods and associated earth slips, health hazards etc. due to retaining excess water in the local context. Stake holders and Community consultations confirmed effectiveness of this during the recent floods.

Reduced suspended sediment load from the large catchment area due to the construction, in runoff is identified to be significant to cause regional impacts though less significant.

Thus the Action Project is environmentally sustainable. Establishing a partnership approach with local community (CBO such as Rural Development Society) for maintenance of the facility will ensure long term sustainability.

This action project provides a replicable pilot model for similar work with necessary changes to suit the scale and location of the Project.

Major environmental impacts of Gatangama, Mudduwa storm water drainage construction Action Project:

Table 10	Features		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Soil erosion control	+	Significant	Insignificant
Water pollution control	+	Significant	Insignificant
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Biological Environment	Insignificant		
Social Environment			
Reduced floods	+	Significant	Insignificant
Improved traditional land uses	+	Significant	Insignificant
Built infrastructures protection	+	Significant	Insignificant
Poor working relations between community and MC	-	Significant	Insignificant
Comply with regulations	+	Significant	Insignificant

Note: Construction impacts are insignificant, thus not mentioned.

This is a road drain construction for speedy discharge of storm water coming from the surrounding mountainous area and paddy lands.

As show in *Table 10* the overall impacts are positive upon physical environs whilst neutral upon the biological element. The regional level impacts are insignificant due to the micro scale of the Action Project.


The concrete drain at Gatangama

Social Impact

The community in Gatangama expressed their satisfaction that the floodwaters no more inundate the access roads. The monks in the adjacent temple were content that the rain water does not stagnate in their bathing well any more. Although the overall social environmental impacts are positive, the communication gap noticed between the community in Gatangama and MC was found to be a significant negative impact, which the MC holds the Project responsible. This condition is likely to disrupt the maintenance and continuity of the strategic action deliverable. Direct interaction by MC with the community group under the blessings of community leaders and political authority will bridge this gap bringing overall impacts entirely positive.

Thus, the Evaluation findings indicate that the Project is sustainable subject to strengthening communication between community and MC for proper maintenance of the structures.

Action Projects in Ratnapura MC area were not known to Lane Committee participants implying that views of only a section of the community had been considered when selecting Action Projects. However the Lane Committee members identified floods, landslides, poor drainage facilities, unprotected abandoned gem mines resulting in epidemics such as dengue and improper garbage disposal as disaster related vulnerabilities, all which have been incorporated as Action Projects by the Project.

Batticaloa MC

A single action project has been implemented in Batticaloa MC area. Evaluation findings of its environmental impacts are discussed below:

Summary of Major impacts of Thiruchenthur coastal green belt Project is tabulated in *Table 11* as follows:

Table 11	**Features**		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Coastal erosion control	+	Significant	Insignificant
Enhanced coastal morphology	+	Significant	Insignificant
Improved natural drainage	+	Significant	Insignificant
Biological Environment			
Enhanced ecosystem functions	+	Significant	Insignificant
Enrich biological diversity	+	Significant	Insignificant
Natural foliage regeneration	+	Significant	Insignificant
Social Environment			
Protection from storm surges, cyclones, tsunami	+	Significant	Insignificant
Enhanced aesthetics	+	Significant	Insignificant
Livelihood support functions	+	Significant	Insignificant
Ensured traditional land uses	+	Significant	Insignificant
Improved tourism	+	Significant	Less significant
Comply with regulations	+	Significant	Insignificant

The constructional phase impacts are insignificant due to the micro scale of the work. Sourcing of building material does not cause significant impacts since the sources are away from the Project locality. Construction process including ground preparation and material handling are limited to temporary disturbance to beach access and fishing etc., also remain insignificant. The post construction evaluation summary in *Table 11* illustrates that the construction brings positive impacts upon all three elements of the environment. The photographic survey findings show the development with these positive impacts.


Different varieties of well grown plants with undergrowth creeper

It is apparent that this vegetation will be a good buffer reducing storm surge, cyclone and tsunami wave impacts, when fully grown. The community also expressed the same view with their past experience. Furthermore the selection of native plant species brings multiple benefits of ecological importance including natural regeneration, which is a key to sustainability as well.

The community currently benefit with recreational infrastructure and will be enjoying more benefits such as having a shaded area for traditional fishing activities and potential tourist attraction leading to micro financial opportunities. The development has well accommodated the traditional coastal engagements of local community like recreation, beach seine (Ma del) and boat fishing accessibility etc.

Overall, this mitigation measure has provided an appropriate and a sustainable solution addressing a community concern. However, due to the micro scale of the Project, the impacts do not extend to the regional level except benefits of enhancing tourism potential.

It was observed that the Project had not pursued community participation in planting but contracted to a third party contractor. As a result the local community had no feeling of ownership and lack of interest in maintaining the plantation. Although well protected with a fence, several pockets of plants were observed to have died.


A section of failed vegetation, which required to be replanted

In the light of these findings following proposals are made to ensure the long term sustainability of the solution:

- Establish a Public-Private partnership between BMC, Forest Consercation Department, CCD and Rural Development Society to facilitate maintenance of the plantation
- Engage school children to set up a knowledge centre based on plantation recording planted species, their ecological functions and growth pattern etc., whilst motivating them as care taker groups of the plantation
- Establish a mechanism to obtain regular guidance from Forest Consercation Department and CCD
- The Project as a pilot scale model confirms that the same methodology with aforementioned improvements is successfully replicable in other similar areas as identified in the DRR Plan provided a maintenance plan is formulated from the time of planting

Field discussions revealed that Sathurukondan wetland, a migratory birds hosting ground and Manthivu Island are some of the ecosystems in the area featured with sensitive ecological functions. These not only indicate the ecological importance of the lagoonal system but also have a high potential economic value hence may be considered by future Projects.

Social Impact

The community had identified a bridge for Navalady and a Gabion wall with steps as priority needs. Instead the Pilot Project implemented had been a section of the Green Belt in Thiruchendur area leaving the community disappointed. In the case of the Green Belt, they had not liked the plant verities selected initially. They have requested that a road be constructed along the Green Belt to accommodate the lorries that transport fish. Instead the Project has provided a narrow walkway. This had caused economic hardship to the poor fishermen who now have to incur labour costs to carry the fish to the lorries. The Technical Officer confirmed that the agreed width of the road had been five feet. The Project had constructed a children's park however the community's request had been for a Football Ground as there had been one prior to the Tsunami. It may be good for future projects to explain the long term benefits of projects and get the concurrence of the community to prevent negative impact.

Kalmunai MC

Summary of Major Environmental impacts of road drainage construction Project at "Udaya road", Kalmunai:

Table 12	**Features**		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Soil erosion control	+	Significant	Insignificant
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Biological Environment	Insignificant		
Social Environment			
Reduced flood hazard	+	Significant	Insignificant
Protects the access road	+	Significant	Insignificant
Comply with regulations	+	Significant	Insignificant

The construction phase impacts are insignificant due to the micro scale of the work. Sourcing of building material does not cause significant impacts since their sources are away from the Project locality. Construction process including ground preparation and material handling limit to noise, air pollution (fugitive dust emission) and temporary disturbance to use of access road etc. remain insignificant.

A view of built road drain, which is effective but not being well maintained

The post construction evaluation summary in *Table 12* illustrates that the construction brings positive impacts upon physical and social elements of the environment whilst insignificant upon the biological element. The Picture show the built drainage, though not maintained, has been effective in prompt discharge of storm water reducing the flood level compared to the past according to the local community.

However, due to the micro scale of the Project, the impacts do not extend to the regional level.

The environment impact evaluation based on survey findings indicates the mitigation actions are appropriate, effective and sustainable in terms of environmental perspective. Following will facilitate the MC to ensure the long term delivery of the project benefit as emphasized in the DRR Plan:

- Undertake detail base line studies on site level geophysical setting to record and incorporate same to produce project designs including construction plans/ methodologies etc.

- Consultation of the community, line agencies and political authority to identify priorities and effective methodologies
- Undertake a study on the existing ecosystem to record and assess the overall ecosystem impacts of the Action Project in parallel to designing planning process of the project. Subsequently incorporate the recommendations to the methodology.

Other observations:
Lack of well-established proper solid waste management scheme is a major issue, which leads to secondary hazards like epidemics followed by floods.

Social Impact
The members of the Lane Committees were not aware of this Action Project although overall, this mitigation measure has provided an appropriate and a sustainable solution addressing a community concern. Nevertheless, establishing mechanism to obtain the community participation for maintenance will be essential to ensure the long term sustainability.

Site observations indicated the poor maintenance whilst the community consultation revealed lack of participatory approach for the construction. This adversely affects the sustainability of the built structure. There were complaints that the Local Authority had not left provision for access to houses. The drain was at a much higher elevation than the ground level hence there was stagnation of flood waters in the compound even after rains ceased.

The Project as a pilot scale model confirms that the same methodology with improvements to obtain effective participation of the vulnerable community is successfully replicable in other similar areas as identified in the DRR Plan.

Phase II
Criteria adopted to identify and prioritise the implemented pilot projects were frequency of occurrence of hazards and the magnitude. Main focus was on very high risk and high risk areas. Core stakeholders; community, responsible officers from relevant authorities, Local Government officials and relevant professionals selected the projects.

(i) Akkaripattu DSD area
Out of the proposed Action Projects, rehabilitation of Meera Odai (inland water body), was selected in order to reduce floods in the Meera Nagar Area. The excess water from Meera Odai flows to the Periya Kalapu which is approximately three kilometers away through a narrow drain. Due to the blockage of the drain the area gets flooded. Therefore the drainage outlet was redesigned.

Environmental Impact of the Action Projects Implemented:


Road-ward view of the drainage

It is understood that, selection of the best time window for construction, when the dry whether dominates, has further reduced the adverse social impact level.

The construction impacts of this project are insignificant, thus not discussed in detail. The evaluation indicates the overall post construction impacts upon all three elements of the environment are positive. It must be noted that the impacts were evaluated on the basis that this Project does not build new drains but restore the past natural hydrographical pattern in the area by rehabilitating this abandoned drain.

Thus, the project output serves the purpose whilst bringing multiple environmental benefits. This confirms that the project is relevant and sustainable in terms of environmental considerations.

Nevertheless, the post construction maintenance of the infrastructure is very important to ensure long term sustainability and requires high level of public participation; prevention from littering and encroaching the drainages as well as water retaining ponds (Thona).

The summary of Major environmental impact of the action project implemented in Akkaripattu DSD area is tabulated below:

Table 13	**Features**		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Soil erosion control	+	Significant	Insignificant
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Water pollution control	+	Significant	Insignificant
Improved ground water quality	+	Significant	Insignificant
Biological Environment			
Enhance ecological functions	+	Significant	Insignificant
Enriched biological diversity	+	Significant	Insignificant
Social Environment			
Reduced flood hazard	+	Significant	Insignificant
Protects the access road	+	Significant	Insignificant
Enhanced living environs	+	Significant	Insignificant
Control further water catchment encroachment	+	Significant	Insignificant
Comply with regulations	+	Significant	Insignificant

As also recognised in the DRR Plan, it is proposed to adopt following measures to guide the project deliverables in this direction:

- Establish a working partnership with the community groups, private sector and the line agencies for proper maintenance of the constructions
- Undertake awareness campaign for the residents and floating population to refrain from littering, misusing and damaging the structures built

Other issues observed:
Lack of well-established proper solid waste management scheme is a major issue, which leads to secondary hazards like epidemics followed by floods.

Social Impact
The community was appreciative that the Project accepted their views and selected this Action Project for demonstration purposes to prevent flooding in the area. The site observations confirm that the community is confidant and happy about the flood relief due to better circulation of storm water through the drainage, which is still under construction. Although 42 meters out of the 262 planed length is yet under construction, already the residents have experienced the benefits during the recent floods. They believe that once completed it will provide a total solution for the flooding in the area.

This Project as a pilot scale model is replicable in similar areas, with the improvements proposed.

(ii) Vavuniya UDA area

Restoration of the spill canal and two culverts between Vavuniya Kulam and Periyakulam was prioritized by the community as the demonstration project so that there is no obstruction for flood waters to run, preventing flooding in the area.

The built culvert and drainage wall ensuring access on traditional routes

It must be noted that this Action Project complemented the parthenium (an invasive plant) control actions undertaken as a community participatory event in parallel to this Action Project as the potential risk of spreading the plant was addressed during the material handling for the construction.

Environmental Impact of the Action Projects Implemented:

This Action Project causes significant environmental impacts out of the implemented projects. The summary of major environmental impacts of Restoration of the spill canal and two culverts between Vavuniya Kulam and Periyakulam is tabulated below:

Table 14	**Features**		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Soil erosion control	+	Significant	Insignificant
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Improved water quality	+	Significant	Insignificant
Biological Environment	Insignificant		
Social Environment			
Reduced flood hazard	+	Significant	Insignificant
Ensured traditional access ways	+	Significant	Insignificant
Protects built infrastructure	+	Significant	Insignificant
Comply with regulations	+	Significant	Insignificant

The constructional phase impacts are insignificant due to the micro scale of the work. Sourcing of building material does not cause significant impacts since their sources are away from the Project locality. Construction process including ground preparation and material handling limit to noise, air pollution (fugitive dust emission) and temporary disturbance to use of access road etc. remain below significant level.

The post construction evaluation summary in *Table 14* illustrates that the construction brings positive impacts upon physical and social elements of the environment whilst insignificant upon the biological element. The Picture shows the built culverts and improved drainage that have been effective in reducing the flood level comparing to the past according to the local community. However, due to the micro scale of the Project, the impacts do not extend to the regional level.

Overall, this mitigation measure has provided an appropriate and a sustainable solution addressing a community concern.

The Project as a pilot scale work confirms that the same methodology with improvements proposed is successfully replicable in implementing other similar projects, which are identified in the DRR Plan.

Social Impact

Restoration of the spill canal and two culverts between Vavuniya Kulam and Periyakulam was a felt need of the community. The small culverts were a bottleneck for the floodwaters to flow despite the Department of Irrigation cleans the canal prior to the monsoons. As a result the houses were inundated. A cadjan hut got washed off during the floods. This Action Project helps the flood waters from Vavuniya kulam to flow to Periyakulam without interruption. The houses had not been affected by the recent floods after construction was completed.

Nevertheless, establishing a mechanism to obtain the community participation for maintenance coupled with continual awareness to refrain from harmful actions (e.g. disposing waste) will be essential to ensure the long term sustainability although the canal is the property of the Department of Irrigation. However settlements on the encroached lands within water line of reservoir in the reservation are a major issue, which affect both settlers and rest of the community in flood/ drought risk prone areas. The UC is working with line agencies (Department of Irrigation/ Department of Agriculture, UDA etc.) and political authority to resolve this issue.

The UC works in partnership with community and other relevant line agencies to:

- Control spreading of the invasive plant 'parthenium' (a pilot project has been implemented with community participation as part of the DRR Plan development process)
- Establish proper solid waste management scheme resolving multiple hazard risks associated with current open dump in 'Pompamadu' (Vavuniya south Tamil Pradeshiya sabha zone), where a new settlement construction is in progress
- Manage the elephant corridor across Nochchimotai (within the UDA declared zone)

(iii) Maritimepattu PS area

Absence of a storm water drainage master plan was a major drawback for Maritimepattu PS area. Kallapadu South in particular was frequently inundated by flash floods due to its flat terrain. Hence preparation of the Drainage Master Plan was a priority need. The Project selected construction of a drain 356 meters in length in Kallapadu South as the demonstration project.

Environmental Impact of the Action Projects Implemented:

The Summary of Major impacts of the road drainage construction Action Project in Maritimepattu PS area is depicted in *Table 15*:

Table 15	**Features**		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Soil erosion control	+	Significant	Insignificant
Biological Environment	Insignificant		
Social Environment			
Reduced flood hazard	+	Significant	Insignificant
Protects access roads	+	Significant	Insignificant
Protects properties	+	Significant	Insignificant
Sluice gate prevents salt water intrusion at high tides	+	Significant	Insignificant
Comply with regulations	+	Significant	Insignificant

The constructional phase impacts are insignificant due to the micro scale of the work. Sourcing of building material does not cause significant impacts since their sources are away from the Project locality.

Construction process including ground preparation and material handling limit to noise, air pollution (fugitive dust emission) and temporary disturbance to use of access road etc. remain less significant.


Seaward view of the sea outfall

The post construction impact evaluation summary in *Table 15* illustrates that the construction brings positive impacts upon physical and social elements of the environment whilst insignificant upon the biological element. The Picture shows the sea outfall at the end of the built drainage. However, due to the micro scale of the project, the impacts do not extend to the regional level.

This is a pilot scale model and confirms that the same methodology with aforementioned improvements is successfully replicable in other localities as identified in the DRR&P Plan.

Other issues observed:
It was noted that lack of well-established solid waste management scheme is a major issue, which leads to secondary hazards like epidemics followed by floods. This issue has not been addressed by the Action Projects.

Social Impact
It is a successful project according to the Local Authority staff and Grama Niladhari of the area. The community is generally satisfied that the construction has been effective in discharging storm water reducing the flood level to some extent compared to the past. If the situation is to be resolved completely, all the drains and the culverts in the affected area need to be constructed.


Complaining that the compond gets inundated after drainage construction

A Social Audit Committee comprising of seven members had been appointed by the community on the advice of the PS for supervision. Nevertheless several members of the vulnerable community were disgruntled that the slope of the drain was faulty in one location causing stagnation of water. Further they complained that despite being told during construction the drain has been built above ground level without provision for water outlets hence their compound gets inundated. As a result they have broken the wall of the drain at several points for the flood waters to subside. The Municipal Commissioner of the Local Authority assured the community to rectify the issues. However the DMC officers stated that there had been no complaints from this area during the recent floods.

Overall, this mitigation measure has provided a sustainable solution addressing a community concern. Nevertheless, followings are proposed to ensure the long term sustainability:

- Establish a mechanism to obtain community participation/ inclusion of local knowledge for design, construction and maintenance phases
- Undertake a comprehensive technical feasibility and verify same with local community and community leaders participation
- Obtain consent of Department of Coast Conservation (CCD) for constructions on the beach and establish partnership with relevant line agencies like CEA, Department of Forest Conservation and Department of Wildlife Conservation etc.

(iii) Mannar DSD area

The Action Project prioritized comprised of construction of an embankment to mitigate sea water intrusion at Pallimunai, east of Mannar Island, elevated road accessing lagoon and Knowledge Centre against a picturesque background of the lagoon, which is to be handed over to the Department of Wildlife Conservation (DWLC) as the land is within the Wenkalai Bird Sanctuary. Out of the proposed 334 meters, 163 meters of the embankment has been constructed as a demonstration project. An attempt had been made to plant trees to beautify the area. Eight (8) culverts and gravel roads also have been built.

Embankment to mitigate sea water intrusion at the far end

Environmental Impact of the Action Project Implemented:

The results of the environmental impact evaluation of the implemented Action Project, which causes significant structural changes in the physical environs is briefly described below. Summary of major impacts of the Project implemented to reduce coastal erosion and limit sea level rise and storm surge:

Table 16	Features		
Environmental Impact	**Type**	**Local effect**	**Regional effect**
Physical Environment			
Improved natural drainage	+	Significant	Insignificant
Improved built drainage	+	Significant	Insignificant
Protected lagoon capacity by reducing encroachments	+	Significant	Insignificant
Erosion control	+	Significant	Insignificant
Biological Environment			
Enhanced ecological functions	+	Significant	Insignificant
Enriched biological diversity	+	Significant	Insignificant
Social Environment			
Reduced flood, storm surge, and Sea level rise hazards	+	Significant	Insignificant
Ensured traditional beach access	+	Significant	Insignificant
Ensured traditional practices of local fishing community	+	Significant	Insignificant
Enhanced living environs for new settlers	+	Significant	Insignificant
Enhanced tourist attraction	+	Significant	Insignificant
New opportunity for ecotourism & ecosystem knowledge sharing	+	Significant	Insignificant
Comply with regulations	+	Significant	Insignificant

The construction impacts of this project are insignificant, thus not discussed in detail. The evaluation indicates the overall post construction impacts upon all three elements of the environment are positive.

Knowledge Centre and the road

The design of the construction includes a nature friendly rubble mound earth bund structure with tidal water exchange gateway ensuring less resource consumption and continuity of the natural ecosystem functions. The terrestrial boarder of the sanctuary is demarcated preventing potential encroachment bringing a tourist attraction to the site. The DWLC has granted approval for the construction ensuring its compliance with their technical requirements.

The Contractor has planted unsuitable tree species to the lagoonal environs instead of recommended mangroves. The benches placed inside the Knowledge Centre differs from its original design. It was observed that the pond needs to be dredged further. The site clearance after construction was also not satisfactory.

Despite these draw backs, the project output serves the purpose whilst bringing multiple environmental benefits. This confirms that the project is relevant and sustainable in terms of environmental considerations.

The post construction maintenance of the infrastructure is very important to ensure long term sustainability and requires high level of public participation for proper maintenance of new plantation, Knowledge Centre and the road, embankment etc. As also recognised in the DRR Plan, it is proposed to adopt following measures to guide the project deliverables in this direction:

- Establish a working partnership with the community groups, non-government organizations and the line agencies for proper maintenance of the constructions
- Introduce a monitoring body comprising of Local Authority, DWLC, Department of Fisheries and Aquatic Resources and Divisional Secretariat for due maintenance of the bird sanctuary associated environs
- Undertake a detail ecological survey of the area to record current status and share with other decision making line agencies
- Coordinate with the Tourist Board and relevant agencies to introduce eco-tourism to divert aesthetic attractions to gain financial benefits for the local community as well as maintenance needs

Other issues observed:

- Lack of well-established proper solid waste management scheme is a major issue In Mannar, which leads to secondary hazards like epidemics followed by floods.
- Beach sand mining (in Pesalai) is also a major issue, which causes coastal erosion increasing vulnerability to multiple hazards like storm surges, sea level rise and salt water intrusion etc.

Social Impact

The strategy to gain community participation for the construction as well as construction monitoring seemed to be poor. The community complained that during heavy rains flood waters overflow the elevated road constructed by the Project and inundated their property. When further probed they stated that the sluice gate had not been closed. The responsibility of closing the sluice gate lies with the community. However there was no evidence visible such as water lines at the time of the field visit to assess the accuracy of such information.

May be these issues could ease off after completion of the balance 171 meters of the embankment. Had there been community participation during construction phase the discontent may have been prevented. Also the contractor would have been able to find out the suitable tree species to be planted in that area – learnings for future projects.

This Project as a pilot scale model is replicable in similar areas, with the improvements proposed. However the Project may withhold the retention money to the contractor prior to completion of the remaining work.

3.4.4 Impact on Level of Collaboration of Institutions

Prior to commencement of the Project the Local Authorities, DS Office and other relevant institutions more often than not worked independently with separate mandates in disaster response and relief operations. Now the collaboration among institutions has improved and it was visible that they work in unison. The Local Authorities in all Project locations except Mannar attributed improved collaboration among institutions, particularly Local Authorities and the DS Office to the Project; a positive contribution of the Project. However it will take a much longer duration to change the mindset of the political leadership in Mannar.

3.5 Sustainability

3.5.1 Disaster Risk reduction and Preparedness Plan (DRR&P Plan)

Preparation of the DRR&P Plans, for all eight towns in *Phases I and II* using participatory methodology involving all stakeholder categories, particularly the community, is an enormous mission and is highly commendable. This is a comprehensive document that consists of Baseline information including local area socio-economic profiles, strategic assessments with detailed hazard mapping, vulnerability and risk assessments, SWOT analysis and core problem analysis. Based on the findings, strategic directions and Action Projects have been identified in order to make these towns disaster resilient, sustainable and healthy cities.

The guidelines and regulations have been incorporated with amendments or modifications as appropriate by UDA in the Development Plans, hence sustainable. For example, as mentioned above, Planning Regulations pertaining to plot size, plot coverage, Floor Area Ratio (FAR), building heights were modified by the UDA prior to incorporation to the Development Plans.

In the case of *Phase I* Project location Batticaloa MC, the Vulnerability and Hazard Risk Analysis have been incorporated together with the maps, in *Volume I* of the Development Plan. The Disaster management Plan with all strategic Action Projects have been incorporated to *Volume II.*

In Kalmunai MC also, Vulnerability and Hazard Risk Analysis have been incorporated together with the maps in *Volume I.* The Disaster Management Plan has been incorporated in *Volume II* with the main strategic Action Projects. However, it was observed that the transfer of officers who were spearheading the project in Kalmunai MC had resulted in an adverse effect on sustainability of the project to a great extent as the new staff did not seem to be much aware of the Project.

In the case of Balangoda UC and the Ratnapura MC, incorporation of DRR&P Plan to the Development Plan seems to be inadequate and inconsistent. Only some of the Action Projects have been incorporated to the Development Plans hence sustainable. Despite the fact that the Local Authorities through its Planning Committees can implement and monitor the Development Plans with the powers delegated to them by UDA with their supervision, other Action Projects will have no legal bearing hence will not be sustainable unless Planning Committee approval is sought prior to implementation of each project.

The Development Plans prepared for the four towns in *Phase II* Project locations are in various stages of draft form yet, hence not gazetted. The draft Development Plans prepared for Vavuniya UC (amendment to the originally approved plan) and Akkaraipattu MC are awaiting the recommendations of the stakeholder meetings to be held within the Local Authority. The Development Plans for Mannar DSD and Maritimepattu PS areas are under preparation.

According to UDA Law the draft Development Plans have to be recommended by the Planning Committee and the Board of Management of the UDA to the Honourable Minister in charge of Urban Development, Water Supply and Drainage prior to his approval and gazetting. For the Plans to be sustainable, this process has to be followed for all four draft Development Plans in *Phase II* locations.

A comprehensive document on building guidelines has been prepared by the Project. Some of the building guidelines which can be implemented were incorporated to Development Plans, gazetted and converted as regulations by the UDA. However due to practical issues in implementation, insufficient specifications and quantification, most of the guidelines have not been incorporated to the Development Plan by the UDA. Nevertheless UDA requires Planning and Building Regulations to be components of the Development Plan. Therefore it is a legal requirement to incorporate Building Regulations to the Development Plan.

Had there been regular consultations between UOM and UDA, UOM may have been able to provide practical solutions based on the requirements of the UDA and the proposals documented in the DRR&P Plans could have been incorporated preventing wastage of the wealth of information generated. Similarly it may have been beneficial if multidisciplinary teams of professionals from the relevant institutions such as Geotechnical Engineers and Geologists knowledgeable in issues in relation to landslides, Water Resource Management Engineers and Irrigation Engineers for issues in relation to floods together with the UDA were consulted when preparing the building guidelines. Such consultations may have helped in preparation of guidelines and plans that would have catered to UDA requirements, facilitating realization of almost all the strategic directions proposed in the DRR&P Plans.

As most of these building guidelines have not been incorporated to the Development Plans, it is recommended that these be published in the website of UN Habitat, UDA and relevant Local Authorities for awareness of the public, in an effort to improve sustainability.

3.5.2 Environmental Perspective

The Action Projects recommended in all DRR&P Plans in general are observed to be sustainable within the context of existing environmental settings. The mitigations seem to deliver positive changes, which are bearable in terms of both spatial and temporal dimensions of relevant environment. The expected changes are ecologically sound, socially acceptable and seem to be cost effective.

Nevertheless, close review of findings indicate that the potential impacts of overall DRR&P Plans upon local and regional environs required scrutiny and further mitigated if needed, to ensure environmental sustainability. The recommendations made to drive the Project impacts in this direction enhancing long term delivery of its benefits are set-out in *Chapter 5.0 'Recommendations'* of this Report.

3.5.3 Social Sustainability

Community participation in planning and implementation is a good practice as implementation of community based development initiatives help to foster community ownership of the projects enhancing sustainability.

The ***CDPCs*** other than in Balagoda UC take a reactive approach negating the very purpose it was formed, which is disaster preparedness. Had there been a TOR, the purpose of the committee would have been clearer to the Local Authorities as well as the CDPC members. The Project may advice the Local Authorities to draw a plan for atleast one year to begin with, based on disaster

preparedness rather than on relief work if the Project objectives are to be achieved. Currently, Balangoda UC looks at a 3 month rolling plan.

The ***Lane Committees*** introduced in *Phase I* are a good concept. If they can be scaled-up and replicated in all high risk and very high risk areas with a time plan, it will assist in achieving the Projects anticipated result of building resilient cities. Sustainability of the Lane Committees depends on continuous engagement in activities. The commitment both on the part of the Local Authorities in Balangoda UC and Ratnapura MC as well as the Social Animators and the fact that the Social Animators have earned respect from the community and the Local Authorities in doing a job until completion and the fact that Lane Committees are continuously engaged in all types of village activities, it is likely that the Lane Committee system will remain over a considerable period of time. However Batticaloa Lane Committee meets only during disasters hence have the risk of going into complete dormancy whereas Kalmunai Committee is already non-functional. It may be beneficial to bridge the gaps and introduce this concept to *Phase II* locations as small committees are manageable and effective.

Periodic training is needed for Rapid Response Teams (RRTs) to improve their skills as well as to be prepared to act without going into dormancy. It will also facilitate succession planning and provide space for new members to join.

The officials are encouraged and inspired due to the capacity building progammes. However they appreciate if the frequency of training programmes could be increased so that they can be abreast with the technological advancements.

However DRR Units established which is an achievement that can be attributed to the Project needs a lot more institutional strengthening if they are to take proactive action in disaster prevention work. Since Project Exit, they have only been a part of disaster relief work.

3.5.4 Financial Sustainability

One of the major achievements of the Project is introduction of a Budget line in Ratnapura and Akkaraipattu MCs and Balangoda UC and allocation of funds for DRR activities in Batticaloa, Kalmunai MCs, and Vavuniya UC in general budget lines. However though Vavuniya UC had allocated funds in 2014 it has been discontinued in 2015 as the funds have not been utilized in 2014,[8] a cause to be concerned. The Project may review the situation and take appropriate action to advise the VUC to formulate a plan for DRR purposes. If not there is a risk of the efforts made by the Project coming to an end before long.

However, in all locations other than BUC and RMC, financial sustainability is limited to maintenance of activities yet. BUC and RMC use the allocations for training in addition to maintenance work. If the Action Projects are to be implemented more aggressive funding strategies need to be developed at the earliest.

Mannar UC and Maritimepattu PS use a supplementary budget in case of a disaster. Notwithstanding Mannar UC has been already successful in raising funds to construct the main drainage channels based on the DRR&P Plan with funding from another Development Partner; yet another instance where different organisations have responded to a common cause bringing about greater synergies.

[8] Accountant VUC

Balangoda UC has forwarded proposals to foreign agencies requesting funds for Action Projects identified in the DRR&P Plan. They have also entered for competitions related to resilient city programs by producing the DRR&P Plan. ***Batticaloa MC*** has prepared a separate project proposal including all Action Projects in order to submit to alternate funding partners requesting for funds to make the Action Projects a reality.

The DRR&P Plans prepared by the Project are comprehensive documents which the Local Authorities were unable to produce due to capacity constraints. They are of high quality hence the other Local Authorities may consider utilizing them for fund raising purposes.

4.0 CONCLUSION

A systematic approach had been adopted by the Project in preparation of the DRR&P Plans. Participatory methodology used to elicit information needed for all eight towns in *Phases I and II* involving all stakeholder categories, particularly the affected communities, was an enormous task and will no doubt help to ensure ownership of the Project. With due consideration to bridging the gaps identified and scaling-up the demonstration projects, this Project could be replicated in other disaster prone areas after adapting to the local context.

All the Development Plans have followed the Development Planning Process introduced by the Project. It should be commended that for the first time in the history of UDA community views have been incorporated to urban planning process using participatory methodology. It has paved way to bridge the gap that existed between the Local Authorities, decision makers and the communities. Prior to the Project the community was neither aware of the officials nor the Government mechanisms available to provide services. As a result of the participatory approach taken in project implementation, it has not only been possible to reduce the distance between decision makers and the local communities but also stimulated the local communities to influence the decisions taken by the higher authorities. However the communities were more concerned that the Action Projects identified were delivered rather than preparation of the DRR&P Plans itself.

The project activities have helped to promote closer integration among the Institutions due to the opportunity provided by the Project to convene a series of meetings and consultations during Project implementation. It has helped in enhancing coordination and cooperation among the institutions responding to a common cause bringing about greater synergies and reducing duplication of work and wastage of public funds. It is expected that the changes brought about by the project benefitting the community at large, will remain in the system for a considerable period of time.

It could be concluded that the foundation has been laid down by the Project to achieve its primary goal; ‘establishment of sustainable disaster resilient cities’ due to the comprehensive set of DRR&P Plans that include Strategic Directions and Action Projects. The Officials of the Local Authorities of all eight towns appreciated the Project and considered it a blessing. Despite the fact that they have no funds to implement Action Projects, now they have a comprehensive report incorporating DRR&P features which can be forwarded to Development Partners to obtain funding to make the cities resilient.

5.0 RECOMMENDATIONS

The Project may consider the following suggestions and recommendations in designing and implementing similar Projects in the future:

- *In the case of Balangoda UC and Ratnapura MC, incorporation of DRR&P Plan to the Development Plan is inadequate and inconsistent. Not all Action Projects have been incorporated to the Development Plans. Most of the building guidelines are not incorporated to the Development Plans of all locations due to insufficient specifications and quantification*

Unless and until incorporated to the Development Plans, the level of sustainability of the DRR&P Plans and the building guidelines will be low. Where applicable, the Project may communicate to UDA with regard to the lapses of DRR&P features to prevent wastage of the wealth of information generated by the Project and enable delivery of associated benefits to the public

Until such time the specifications and quantification is provided, it is recommended that the building guidelines are published in the website of UN-Habitat, UDA and relevant Local Authorities for awareness of the public. It may be good to consult professionals and the beneficiaries to arrive at a workable solution at the earliest

- *The UDA declared area of Akkaraipattu consist of 23 GNDs of Municipal Council Area and 5 GNDs of Pradeshiya Sabha. Although the DRR&P Plan has been prepared for the total MC and PS areas the Development Plan has been confined to only the MC area*

As the Development Plans are in draft form yet the Project may communicate this fact to the relevant officials of the UDA so that the information generated could be made used of. Better coordination between the UOM and UDA may have prevented such issues

- *The DRR&P Plan has been prepared for the total Mannar Divisional Secretariat Division (DSD) including the mainland. However as the mainland area of Mannar DSD is not declared by UDA as an urban area, the Development Plan will be confined only to the island*

Similarly, DRR&P Plans have been prepared for the total Maritimepattu Divisional Secretariat Division. However the draft Development Plan has included only the seven Grama Niladhari Divisions that has been declared by the UDA

The Project may forward the DRR&P Plans of the balance areas to the relevant authorities in charge of development activities so that the optimum use can be made preventing wastage of Project resources. The coordination between the Project partners needs to be improved to prevent such issues

- *Although not in the Project mandate due consideration may be given to information needs identified in the field particularly if the benefits accrued are much greater than the anticipated costs*

It may be good to share the hazard risk maps and connected information with relevant Government Agencies such as Central Environmental Authority, Gem and Jewelry Board and Divisional Secretariats which are involved in local land use activities and GNs involved in DRR activities as currently they base decisions on their individual capacities. More so, if it helps in

enhancing efficiency in discharging their duties and responsibilities. Benefits from such endeavors would accrue to a larger segment of the population in and outside the realm of the Project. If action is taken to display these maps in the Local Authorities and offices of officials working at the grassroots level such as GNs, it would help to enhance public awareness and trigger shifting the mindset of the communities towards disaster preparedness

Provision of additional information such as mapping early warning systems in Mannar would have not only helped the DMU but also improved accuracy in decisions made by the Project with regard to installation of early warning systems

- *The Project adopted a participatory approach in eliciting information from inception. Consultations were held with Planning Working Groups (PWG). In Phase II professionals also were consulted*

Wherever there was stakeholder participation from inception undue implementation delays due to stakeholder concerns could be prevented. However, future Projects may be mindful to include all relevant stakeholders and discuss emerging issues to prevent misperceptions. Stakeholder consultation will not only help in providing a platform to elicit vital information needed in designing and implementation of the Project but also in building relationships. It is good to involve Professionals and get their views and expertise from inception so that the quality of the output could be enhanced

- *District Land use Planning Official in Vavuniya expressed his concerns that their input was not considered despite they had the District Land use Plan prepared under a separate project the previous year. He was of the view that important information may have been omitted from the DRR&P Plans*

Although the Evaluation findings revealed that sufficient information on land use had been considered in the planning process, future projects may consider close consultations with all participants in the PWG and professional institutes so that important information could be captured to facilitate thorough decision making. Using readily available information to the extent feasible will prevent duplication of work and wastage of limited resources. Discussions may help in preventing misperceptions as well

- *Majority of the officials or the community who were involved in the Evaluation were not aware of the training programme on 'Disaster Resilient Construction Practices.' The Evaluation Team observed several construction sites in the area which had not adhered to the disaster resilient construction techniques*

The Project may advise the Local Authorities and the GNs to display a list of participants who had undergone the training so that a wider segment of the community can be made aware of the existence of such practices and are able to harness the benefits. In any event the numbers trained need to be increased for the entire community to benefit

The programme can be recommended to be extended to *Phase I* locations and the balance area of *Phase II,* customized to different segments in the industry such as masons and carpenters based on the need. As the programme has a good demand, Project may communicate participant views elicited during the Evaluation to the trainers so that the contents can be modified to suit the beneficiary needs

- *The knowledge gained from GIS training, was well appreciated as it is very useful for hazard mapping, analyzing and reviewing data to prepare Development Plans. However Evaluation findings revealed that a few who participated in the programme though negligible in number, did not need the knowledge in the subject to discharge their duties and responsibilities*

To make the best use of the limited resources a needs analysis may be conducted as training should be provided for participants who can make use of the learnings

- *Phase II school-based awareness creation programme that requested the students to submit project proposals to resolve DRR related issues in their locality instead of the traditional awareness building programmes was well accepted by the students, school authorities, parents and the community alike. The Project assured funding to implement the award winning proposal. However it could not be implemented during the Project period due to procedural bottlenecks and inclement weather*

Future Projects may give due consideration to resolve procedural bottlenecks prior to embarking on such programmes and prevent subsequent disappointments. Setting aside funds ahead or in the alternate extending the Project duration are options to consider

- *In terms of environmental perspective, a close review of findings indicate that the potential impacts of overall DRR&P Plan upon local-regional environs required scrutiny and further mitigated as necessary to ensure the environmental sustainability. The following may facilitate the Local Authorities to ensure the long term delivery of the project benefits as emphasized in the DRR&P Plan*

- Undertake baseline studies to record the key biological and geophysical features of each Project Area (eg; presence of endemic or threatened species)
- Establish a multidisciplinary working group comprising of senior administrators (eg Director EIA of CEA/ DFO of Forest Conservation Department) and technical experts (eg Ecologists, Geologists, Engineers) to evaluate potential impacts of each DRR&P Plan upon the baseline environmental settings with appropriate mitigations for each Project area
- Ensure incorporating the identified further mitigations during implementation of the DRR&P Plan actions through Local Authority or UDA (eg eliminate breaching of sandbar for flood relief in Batticaloa, which will cause ecosystem imbalance)

- *It is proposed to introduce a Public-Private partnership (Local Authority - Community groups or Institutional) approach for maintenance of the implemented Action Projects. It will help to ensure long term sustainability as the ownership is greater. For better quality and maintenance the following is recommended*

Wherever there was community participation in planning and construction phase community satisfaction was visible. Prior to implementation, consultations with the community, line agencies and political authority is desirable as it will help in understanding the ground situation in locality, identifying priorities and gaining community confidance

Undertaking a ground survey (record natural drainage and geophysical settings) to produce construction drawings, on site community consultation to verify their needs in the local context, on site community participation during implementation phase to prevent inconvenience caused due to damages to private property (excessive erosion in private land etc.) and the resultant negative impact on the Project and strengthening community participation (eg Lane Committees) for monitoring and maintenance are recommended

Establishing mechanisms to obtain community participation for maintenance, educating city shop building owners and the public to prevent from disposing solids to water streams and ponds etc., guiding city venders and semi-industrial operators to purify Grey water and industrial effluent prior to discharging into drains and gradually introducing treatment units to discharge treated effluent, erecting notice boards guiding community to refrain from littering or obstructing the drains will help to enhance the long term sustainability.

Awareness campaign for the residents and floating population to refrain from littering, misusing and damaging the structures built also will help.

For long term sustainability of green projects it may be good to engage school children to set up knowledge centres based on plantations; recording planted species, their ecological functions and growth pattern etc., whilst motivating them as care taker groups of the plantation.

It is good to undertake studies on the existing ecosystem to record and assess the overall impact of the Action Projects on the ecosystem in parallel to designing and planning process of the project and incorporation of the recommendations to the methodology

Establishing a mechanism to obtain regular guidance from line agencies such as Forest Conservation Department and CCD is also helpful

- *The road drain in Kirindigala had been constructed by the RDS in view of empowering the rural community. However it has caused multiple hazards partly due to construction faults*

Empowerment of RDSs is a good initiative, however due consideration should be given to closely monitor and prevent adverse social impacts. Future Projects may engage the MC Engineering Team to undertake a comprehensive technical feasibility and provide expert advice due to limitation in community knowhow and construction facilities. Rectification process needs to be expedited to prevent further inconvenience and the resultant negative impact on the Project

- *In general, the City Disaster Preparedness Committee (CDPCs) established under Phase I of the Project as well as the Technical Working Groups formed by the DMUs of which the Local Authorities are a member take more of a reactive approach in connection with the disasters yet*

If the primary Project goal of building sustainable resilient cities is to be achieved, more emphasis is needed on formulation of systematic work plans for CDPCs with greater focus on Disaster Risk Reduction and Preparedness strategies coupled with monthly progress monitoring. Terms of Reference pinning down responsibility on each member of technical teams also needs attention, more so as the elected members change and the officials are transferred to other locations from time to time.

The CDPCs and the DMU based technical committees may take collective action to prevent recurrence of negligent activities such as construction of concreate roads without provision for drainage in Batticaloa and unauthorized constructions as in the case of Mannar UC area that aggravate the risks of disasters. Continuous awareness creation covering all segments of the community including local politicians may help in changing the mindset, with time.

Collaboration of the technical committees of the Local Authorities with the Disaster Management committees established by the DMU is a good initiative. However the focus should not be deviated from disaster preparedness

- *Strengthening the existing DMU based Disaster Management Committee can be recognized as a good practice*

Collective effort made to achieve a common goal without reinventing the wheel will not only help in preventing duplication of activities and the resultant wastage of resources but also in strengthening relationships

- *The Project strengthened disaster risks and resilient capacities of the local communities including women by establishing Lane Committees and Rapid Response Teams (RRT). However in terms of geographical coverage the RRT numbers trained were considered insufficient. So far Lane Committees also have been formed relatively in a few villages. Despite trainers from each village have been trained it is not known whether the Local Authorities have sufficient resources to mobilise teams as in the case of experienced training institutes. If not continuously stimulated there is a risk of even the trained Committees becoming inactive*

As disasters do not occur regularly, a strategy should be put in place to keep the Lane Committee members active. If not, there is a risk of the committees going into dormancy and dying a natural death. The Project may consider utilising the communication channels established through Lane Committees for DRR&P in carrying out other village initiatives and help to prevent inactivation or discontinuation of the Lane Committees. Encouraging these committees to take action to hold Government Authorities responsible for provision of services could help in empowering the members and sustaining the committees. The option of linking child protection or gender based programmes of other Development Partners through the Lane Committees may be explored so that the momentum gained during the Project implementation phase remains over a considerable period of time. It could also help in mobilizing new members too. However for a better impact the geographical coverage could be increased by replication in all risk and high risk areas

It may be beneficial to introduce the Lane Committee concept in *Phase II* locations too. Smaller committees are more manageable and the entire communities in all risk and high risk areas could be reached so that the resilience capacities are enhanced

It may be useful to have written guidelines for Rapid Response Teams as well as Lane Committees so that the new members can be oriented from time to time and are aware of the role expected of them. It will help in succession planning and ensure sustainability of the endeavours. Provision of an Identity Card will also be useful during search and rescue operations.

Continuous awareness creation covering all GNDs is also recommended if the resilience capacity of the communities is to be enhanced

- *The communication gap noticed between the Lane Committees in Gatangama and Rtnapura MC is a significant negative impact, which the MC holds the Project responsible. This condition is likely to disrupt the maintenance of the Action Project implemented and continuity of the strategic action deliverables*

Direct interaction by MC with the community group under the blessings of community leaders and political authority may help to bridge this gap. Mediation by religious leaders, community leaders and political leadership may be sought to iron out the differences to prevent further discontent and negative effect on the Project

- *The Project has supplied DRR equipment direct to the beneficiary communities. As a result majority of the locations neither have an inventory nor are able to trace them*

Future Projects may provide such facilities in consultation with the Local Authority for greater ownership and maintenance. It would help when the items need to be replaced or repaired. In addition whenever the need arises the items could be shared accruing the benefits of limited resources among a wider segment of the community

The Project may follow-up with all locations and confirm whether the DRR equipment/ items have in-fact been installed by DMC or provided to the beneficiaries as there seem to be confusion among the communities interacted in the Evaluation with regard to the items supplied

- *The community expectations were raised when Action Projects were identified. They were concerned that the implementation was restricted to parts of the identified projects*

The future Projects may consider allocation of funds for entirety of the Action Projects rather than for sections even if it is for demonstration purposes to prevent adverse impacts and inconvenience caused due to part constructions such as the drainage project in Balangoda which resulted in increased floods with excessive erosion and water stagnation leading to health hazards such as dengue

- In addition to erecting sign boards, building community awareness with regard to the contribution of the funding partner AUSAID during planning and implementation stages is desirable to enhance visibility

- *The Project has been successful in inspiring the Local Authorities to allocate funds for DRR purposes. However after Project Closure already Vavuniya has discontinued budget allocations*

The Project needs to review the situation and advise the Local Authorities to formulate a plan for DRR purposes to carry forward the work initiated by the Project and ensure sustainability after Project closure. If not there is a risk of the efforts made by the Project being halted

- *The DRR&P Plans have proposed Action Projects to establish community disaster funds, insurance schemes etc. at local level*

Feasibility of such mechanisms needs to be studied further as it is not known how many families can afford the financial burdens of such schemes. The Local Authorities need to make the public aware of the advantages as well as disadvantages well in advance of implementation of the plans

- *In all Project locations other than in Mannar, level of collaboration among the line agencies improved due to Project activities. In Mannar, the level of relationship among the UC, DS Office and the DMU requires improvement*

Although not within the purview of the Project, an attempt may be made to build awareness among the political authorities in the locality on the repercussions of disaster risks until it instills in their minds. It would help in smooth implementation of the Action Projects

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