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ANNUAL PROGRESS REPORT 2016



Community Based Flood and Glacial Lake Outburst Risk Reduction Project (CFGORRP)





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Imja Lake lowering structures -open channel with regulatory gate, constructed to drain water from the Lake

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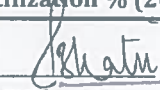
**Community Based Flood and Glacial Lake Outburst Risk Reduction Project
(CFGORRP)
Annual Progress Report 2016**



Figure 1 Imja Lake lowering structures -open channel with regulatory gate, constructed to drain water from the Lake

PROJECT PROFILE

About the Project	Geographic coverage of the project	
Project Title: Community Based Flood and Glacial Lake Outburst Risk Reduction Project (CFGORRP)	National level coverage (Yes/No): Yes	
Award ID: 00069781	Number of Regions covered: Two (Eastern and Central)	
Web link: http://dhm.gov.np/cfgorrrp	Number of Districts Covered: 5	
	Number of Municipalities Covered: NA	
	Number of VDCs Covered: 12	
Strategic Results		
UNDP Strategic Plan Outcome 5: Countries are able to reduce the likelihood of conflict and lower the risk of natural disasters, including from climate change		
UNDP Strategic Plan Output 5.4: Preparedness systems in place to effectively address the consequences of and response to natural hazards (e.g. geo-physical and climate related) and man-made crisis at all levels of government and community		
UNDAF Outcome 7: People living in areas vulnerable to climate change and disasters benefit from improved risk management and are more resilient to hazard-related shocks		
UNDAF/CPAP Output 7.3.2: Water level in Imja Glacier Lake reduced by 3 meters and risk mitigation measures adopted in 4 most vulnerable Terai districts		
Project Duration (day/month/year)	Implementing Partner(s)	Implementation Modality
Start Date: July 15, 2013 End Date: October 2017	1. Lead Implementing Agency: Department of Hydrology and Meteorology (DHM)/ MoPE 2. Department of National Parks and Wildlife Conservation (DNPWC) 3. Department of Soil Conservation and Watershed Management (DSCWM) 4. Department of Water Induced Disaster Management (DWIDM)	NIM/DIM: NEX
Project Budget (US\$)		
UNDP Contribution: 949,430 Government Contribution: NA Other Contributions: Donor Contributions: NA Donor 1: 6,300,000 (GEF-LDCF) Donor 2: Unfunded:		
Total Project Budget:	US\$ 7,568,483	
Total Project Expenditure till 2016:	US\$ 6,723,774	
Budget 2016:	US\$ 4,182,812	
Expenditure 2016 (Indicative only):	US\$ 4,106,096	
Budget Utilization % (2016)	98%	

Signature: 
Name: Top B Khatri
Project Manager
Date: June 2017


Signature: 
Name: Dr. Rishi Ram Sharma
Executive- Project Board
Date: June 2017

TABLE OF CONTENT**Contents**

ABBREVIATION.....	iv
LIST OF TABLES.....	vi
LIST OF FIGURES.....	vi
1. EXECUTIVE SUMMARY.....	1
2. BACKGROUND AND RATIONALE.....	3
3. PROJECT SUMMARY AND OBJECTIVES.....	3
4. PROGRAMMATIC REVISIONS.....	6
5. NARRATIVE ON KEY RESULTS ACHIEVED IN 2016.....	6
5.1 Progress towards the UNDAF/CPAP Outcomes.....	7
5.2 Progress on Project Outputs.....	15
6. BUDGET AND EXPENDITURE.....	24
7. CROSS CUTTING ISSUES.....	26
7.1 Targeting and voice/Participation of Target groups.....	26
7.2 Gender Equality, Women's Empowerment, and Social Inclusion.....	27
7.3 National Capacity Development.....	28
7.4 Sustainability.....	28
7.6 Partnerships.....	29
7.7 Promotion of civic engagement.....	30
7.8 Expanding opportunities for youth.....	30
7.9 Innovation.....	31
7.10 Knowledge Management and Products.....	31
8. LESSONS LEARNED.....	31
9. IMPLEMENTATION ISSUES AND CHALLENGES.....	32
10. PRIORITIES FOR 2017.....	32
11. A SPECIFIC STORY.....	33
12. RISK AND ISSUE LOGS.....	34
13. PROGRESS AGAINST ANNUAL WORK PLAN 2016.....	35

ABBREVIATION

AEWS	:	Automated GLOF Early Warning System
BCPR	:	Bureau of Crisis Prevention and Recovery
CBEWS	:	Community Based Early Warning System
CBFEWS	:	Community based Flood Early Warning System
CBO	:	Community Based Organization
CDES	:	Central Department of Environmental Science
CDMC	:	Community level Disaster Management Committees
CDR	:	Combined Delivery Report
CFGORRP	:	Community Based Flood and Glacial Lake Outburst Risk Reduction Project
CPAP	:	Country Programme Action Plan
DDRC	:	District Disaster Relief Committee
DHM	:	Department of Hydrology and Meteorology
DSS	:	Decision Support System
ED-NA	:	Engineer Department of Nepal Army
ERT	:	Electric Resistivity Tomography
ETW	:	Elevated Tube Wells
EWS	:	Early Warning Systems
FA	:	First Aid
FPDS	:	Flood Proofing Drainage System
FRM	:	Flood Risk Management
GEF	:	Global Environment Facility
GLOF	:	Glacial Lake Outburst Flooding
GoN	:	Government of Nepal
GPR	:	Ground Penetrating Radar
GRMCC	:	GLOF Risk Management Coordination Committee
HQ	:	Headquarters
ICIMOD	:	International Centre for Integrated Mountain Development
IEC	:	Information, Education and Communication
IoE	:	Institute of Engineering
IRD	:	Internal Revenue Department
LDCF	:	Least Developed Countries Fund
LDRMC	:	Local Disaster Risk Management Committee
LDRMP	:	Local Disaster Risk Management Plan
LoA	:	Letter of Agreement
LRP	:	Local Resource Person
LSAR	:	Light Search and Rescue
MoD	:	Ministry of Defense
MoHA	:	Ministry of Home Affairs
MoPE	:	Ministry of Population and Environment
MoU	:	Memorandum of Understanding
MTR	:	Mid Term Review
NA	:	Nepal Army
NAPA	:	National Adaptation Plan of Action
NEOC	:	National Emergency Operation Center
NGO	:	Non-Government Organization
PCTMCDB	:	President Churia Terai Madhesh Conservation Development Board

PEB	:	Project Executive Board
SDGs	:	Sustainable Development Goals
SMP	:	Sediment Monitoring Protocols
SNP	:	Sagarmatha National Park
SOP	:	Standard Operating Procedures
SPCC	:	Sagarmatha Pollution Control Committee
STA	:	Senior Technical Advisor
TA	:	Technical Advisor
ToT	:	Training of Trainers
TRAC	:	Target for Resource Assignment from the Core
UNDAF	:	United Nations Development Assistance Framework
UNDP	:	United Nations Development Programme
USD	:	US Dollar
VAT	:	Value Added Tax
VDC	:	Village Development Committee

LIST OF TABLES

Table 1: Outcome and Output Statements	6
Table 2: Progress on Outcome Indicators	7
Table 3: Progress on Output Indicators	15
Table 4: Output wise annual budget and corresponding expenditure*	24
Table 5: Sources of funds Budget and Utilization of the project period	25
Table 6: M&E Expenditure: In 2016, Project spend on M&E activities	25
Table 7: Risk Log Matrix	34

LIST OF FIGURES

Figure 1 Imja Lake lowering structures -open channel with regulatory gate, constructed	i
Figure 2: Nawang checking the automated Siren installed in Phakding.....	12
Figure 3: Chandra Giri with daughter	13
Figure 4: Open channel with regulatory gate constructed for draining the water volume from Imja Lake	14
Figure 5: A stretch of embankment after the bioengineering works in Hadiya, Udayapur.....	14
Figure 6: Honorable ministers jointly inaugurating the Imja Lake lowering construction works ...	20
Figure 7: Hydrological & Meteorological stations with communication system installed for Imja Lake.....	20
Figure 8: Drinking water and toilets built in Safe Evacuation center, Phungithanka	21
Figure 9: Community engaged in construction of FPDS, Nainhi, Mahottari	22
Figure 10 Mahendra reading the data received from the transmitter placed in river bank of Ratu	23
Figure 11: Evacuation center built in Nainhi, Mahottari	24
Figure 12: Taskforce women members during Mock Drill in Terai	27
Figure 13: Baran Mandal during Mock Drill Exercise.....	33

1. EXECUTIVE SUMMARY

Community Based Flood and Glacial Lake Outburst Risk Reduction Project (CFGORRP) is a joint undertaking of the Government of Nepal (GoN), Global Environment Facility (GEF) and the United Nations Development Programme (UNDP). The project is being implemented by the Department of Hydrology and Meteorology (DHM) under the Ministry of Population and Environment (MoPE) as the lead Implementing Agency. The project's core output as underlined in the United Nations Development Assistance Framework (UNDAF) and Country Programme Action Plan (CPAP) is to reduce the water level of Imja Glacier Lake by at least 3 meters and to implement risk mitigation measures in the four most vulnerable Terai districts. As prioritized by the National Adaptation Plan of Action (NAPA), the project has been designed to reduce the risk of Glacial Lake Outburst Flooding (GLOF) in Solukhumbu and mitigate flood hazards in the Churia and Terai regions.

In 2016, the project remained successful towards attaining the outlined objective of reducing human and material losses from glacial flooding in Solukhumbu and related flooding events in the Terai and Churia Range. The Mid Term Review (MTR) of the project has been carried out May 2016, by a team of national and international consultants. The MTR concluded that project is on track and rated as 'Satisfactory' despite the constraints faced. It prescribed to focus on the sustainability aspects of the interventions undertaken. Hence, project has developed the Exit Strategy & Plan to align with MTR recommendations. In 2016, project implementation went full-fledged with the undertaking of structural and non-structural measures in a bid to reduce flood and GLOF risks. Satisfactory results have been achieved in realizing the project objectives towards reducing vulnerabilities of local communities.

Under component I, the year 2016 was under spotlight as the most challenging Imja Lake lowering works at 5010 masl has been accomplished by mobilizing Nepal Army. The Cabinet decision on February 2016 paved the way for the mobilization of Nepal Army for the lake lowering works. The water level of Imja Lake has been lowered by 3.4 meters, which is believed to significantly reduce the GLOF risks for 12,690 vulnerable people living in high risk settlements within the 50 km downstream of Imja Lake. In addition, the tourists, guides and porters visiting Khumbu region are expected to benefit from this initiative. Besides, operationalization of automated GLOF warning systems in the lake periphery including six major vulnerable settlements in downstream with 18 Community Based Flood Early Warning System (CBEWS) has further strengthened the safety network, to reduce human and material losses from potential glacial outburst flood from Imja. Capacity building of existing 12 Taskforces and Local Resource Persons (LRPs) through equipment support and mock drill exercises constituted the major achievement towards institutionalization of GLOF risk reduction skills and knowledge at the local level. Similarly, 25 officials in Kathmandu and Namche have been trained on GLOF risk management. People have been educated and sensitized about the GLOF risk reduction measures by means of Information, Education and Communication (IEC) materials and airing of regular radio programs.

Under component II, implementation of additional structural measures this year has further contributed to reduce vulnerability of the communities living in the flood prone VDCs. A total of additional 8.9 km of embankment stretches built in Ratu, Gagan, Hadiya and Kong river system is expected to safeguard 35,098 people (20,086 women) living in Sarpallo VDC, Mathottari, Pipra Pra Pi and Tulsipur VDCs in Siraha, Jogidaha and Hadiya VDCs in Udayapur districts. From the implementation of additional 2.9 km of Flood Proofing Drainage System (FPDS), a total of 10,812 people living in Nainhi and Pipra Prapi VDCs in Mahottari and Siraha Districts have benefited from the safe draining of rainwater, helping to make the area drier in monsoon. Implementation of sediment trap measures in 11 sediment laden tributaries of Ratu in upstream will contribute to control sediment flow in the river system. From organizing different training events and awareness related activities, project has been able to institutionalize the flood risk management skills and knowledge among officials from district and VDC level line agencies, and building capacities of local level institutions (LDRMCs, CDMCs, Taskforces and Gauge readers) and communities will have enhanced coping strategy during disasters. Operationalization of CBEWS in five targeted river

systems and Community based Flood Early Warning System (CBFEWS) in Ratu since 2015, has continued to benefit 108,053 people living along the river system, from receiving flood early warnings. Among them, 59,062 beneficiaries live within the targeted 8 VDCs. Additional 48,991 beneficiaries reside in seven upstream VDCs of Ratu, Khado and Gagan river basins.

These initiations at the ground level will support towards building resilient communities as outlined in UNDAF outcome: "People living in areas vulnerable to climate change and disasters benefit from improved risk management and are more resilient to hazard-related shocks".

The project in spite of difficulties faced during the beginning of 2016 in regard to the uncertainty of Imja Lake lowering works and the aftermath of the prolonged political disturbances in Terai region, got back to its normal implementation phase after the Cabinet decision for involving Nepal Army in the lake lowering works and improvement of political scenario in the region. The successful draining of Imja lake water, the highest climate change adaptation works has found spotlight nationally and globally.

The year 2016 has remained a successful year in terms of partnering with communities and stakeholders across all levels for effective implementation of activities for institutionalizing risk reduction knowledge and skills. The lessons/knowledge generated from the implementation of risk reduction measures on GLOF and flood will be documented and shared during the year 2017.

Five key results achieved in 2016

1. **Completion of adaptation works at highest altitude:** Project this year has successfully completed lowering of Imja water level by 3.4 meters and thus reduced the potential GLOF risk from Imja Lake.
2. **Operationalization of automated GLOF Early Warning System (AEWS):** Hydromet and GLOF Sensors have been installed and operationalized in the periphery of Imja Lake along with automated early warning sirens in six vulnerable settlements downstream of Imja. Furthermore, 18 CBEWS comprising of manual gauges, sirens and hand mikes have been made operational in 18 vulnerable downstream settlements as part of preparedness measures. Over the reporting period, 12 Taskforces have been formed, capacitated and equipped with community based early warning systems in a bid to make resilient communities. Altogether 12,690 people living in vulnerable settlements within 50 km downstream of Lake including 74,992 tourists visiting Everest region, will benefit from interventions undertaken under component I.
3. **Structural measures in place for flood risk reduction:** With construction of additional of 8.9 km of embankment with gabion revetment works; bioengineering works in additional 5.1 km of embankment for strengthening; rehabilitation/construction of additional 2.9 km of Flood Proofing Drainage System (FPDS); implementation of sediment trap measures in 11 sediment laden tributaries in upstream of Ratu river and construction of three evacuation centers in vulnerable settlements are expected to further contribute to reduce flood risk and safeguard the vulnerable communities living in river basins of Ratu, Gagan, Hadiya and Kong river systems.
4. **Technical Capacity building:** Technical capacity of 318 officials and representatives (104 female) at national, district and VDC level have enhanced their knowledge and skills on GLOF and Flood Risk Management.
5. **Preparation at community level to combat flood/GLOF risk reduction:** About 8,378 vulnerable people (3,489 women) have been trained and sensitized on flood/GLOF risk reduction measures through a combination of mock drill trainings, exposure visits and street drama demonstrations.

2. BACKGROUND AND RATIONALE

Nepal was ranked as the fourth most vulnerable country in the world due to the impacts of climate change (Maple Croft 2011). The country's average temperature is increasing at an annual rate of about 0.04° C and the trend is much higher in the mountain region. This contributes to glacial retreat and expansion of lakes, thus increasing the Glacier Lake Outburst Flood (GLOF) risks. At the same time, the entire country is extremely earthquake-prone, which adds on the GLOF risk due to the weak geo-morphology of the high Himalayan region.

Fragile geology, deforestation/degradation of the Churia hills compounded by concentrated rainfall causes flash floods and huge sediment transport in Churia originating rivers leading to severe flooding and inundation, posing a great threat to human lives and property downstream. There are few Community Based Early Warning System (CBEWS) placed in the river basins in the Terai plains to date. Government investment in non-structural measures to reduce vulnerability to floods is relatively low and dispersed.

With the implementation of this project, UNDP envisions to strengthen institutional capacities of government agencies and capacity building of local institutions and communities to promote community based approaches to reduce climate change vulnerability and impacts.

Department of Hydrology and Meteorology under Ministry of Population and Environment as a lead implementing agency, has the institutional knowledge and experience of Lake lowering works in Thso Rolpa Glacial Lake in 2000, the pioneer GLOF risk reduction project in Nepal. The project aims to replicate such knowledge and learnings in Imja Lake. Located at an altitude of 5,010 meters in Solukhumbu district, within the Sagarmatha National Park (SNP), a World Heritage Site, Imja Glacial Lake is one of the rapidly growing lake in the Hindu Kush Himalayan region and among 6 glacial lakes identified as most 'critical' in terms of GLOF risk.

Project has placed high priority for reducing GLOF and flood risk through a community owned low-cost early warning system, which will contribute towards the sustainability of the initiatives. Hence, the lessons learnt from this project would provide further guidance while undertaking similar mitigation measures that warrant immediate attention.

3. PROJECT SUMMARY AND OBJECTIVES

CFGORRP is a joint undertaking of the GoN, GEF and UNDP, implemented by the DHM under the Ministry of Population and Environment. The project contributes to the Profile 3-Community-Based Disaster Management for Facilitating Climate Adaptation and Profile 4-GLOF Monitoring and Disaster Risk Reduction of the country's National Adaptation Plan of Action (NAPA). CFGORRP is the first project being implemented with GEF 's Least Developed Countries Fund (LDCF) after the endorsement of NAPA in 2010. The project is aligned with UNDAF, CPAP and contributes to the Sustainable Development Goals (SDGs) number 13- Climate Action and 6-Clean Water and Sanitation.

UNDAF Outcome 7: People living in areas vulnerable to climate change and disasters benefit from improved risk management and are more resilient to hazard-related shocks.

UNDAF/CPAP Output 7.1: Government officials at all levels have the capacity to lead and implement systems and policies to effectively manage risks and adapt to climate change

UNDAF/CPAP Output 7.3.2: Water level in Imja Glacier Lake reduced by 3 meters and risk mitigation measures adopted in 4 most vulnerable Terai districts.

The objective of the project is to reduce human and material losses from GLOF in Solukhumbu district and catastrophic flooding events in the Terai and Churia Range. For achieving this objective, the project is streamlined into two outcomes/components.

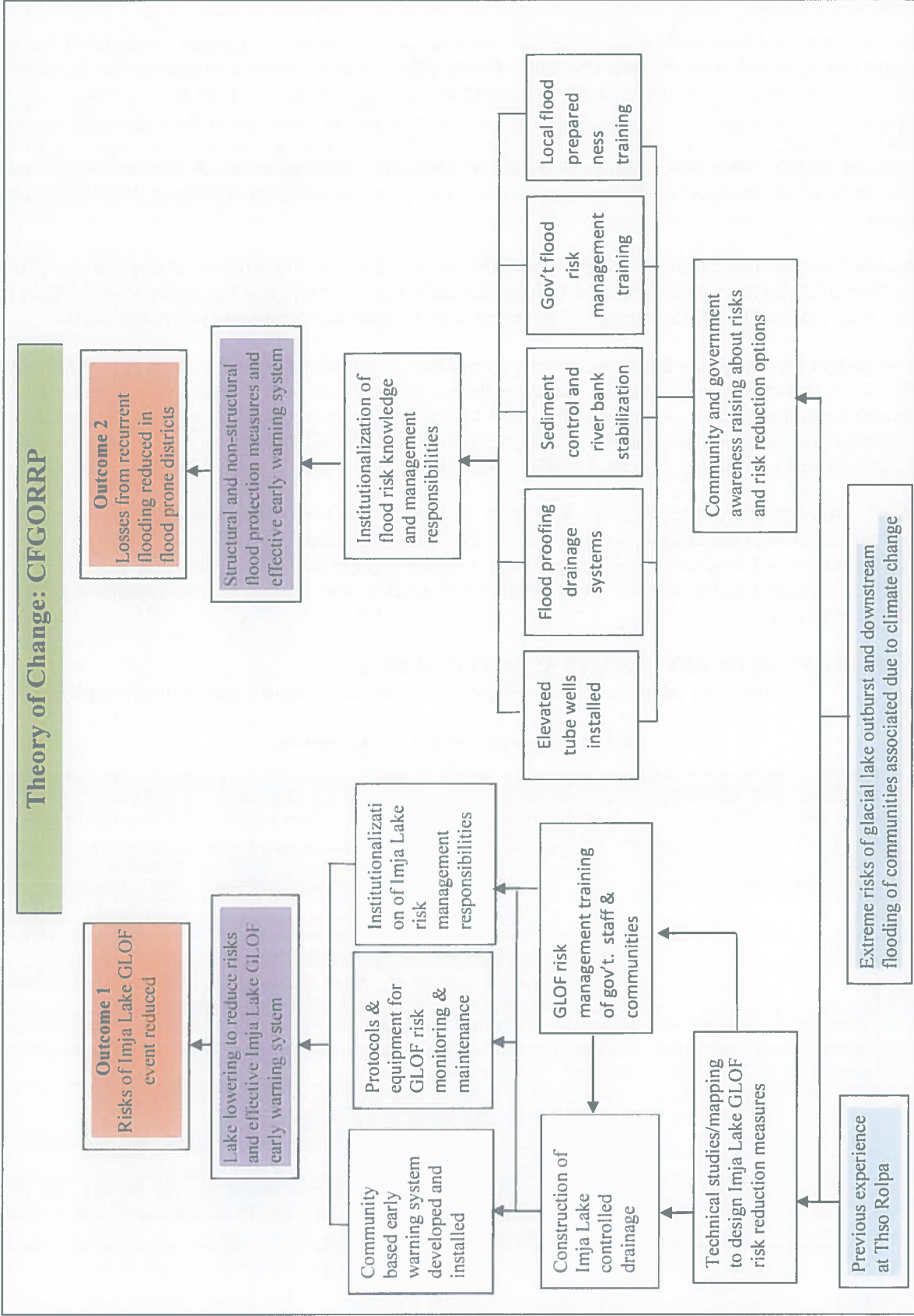
Outcome/Component I aims to reduce GLOF risks arising from Imja Lake. The major outputs under GLOF component encompasses: construction of artificial controlled drainage system for Imja Lake, monitoring of lake and channel levels by local community and institutional representatives, designing of a practical, low-tech and gender-sensitive low-maintenance CBEWS and training in GLOF Risk Management, thereby institutionalizing GLOF knowledge at local and institutional level. Development of an artificial controlled drainage system; installation and operationalization of CBEWS and strengthening individual and institutional capacities for GLOF risk management are the strategies adopted for reduction of potential losses from GLOF hazard.

Outcome/Component 2 aims to reduce human and material losses from recurrent flooding events in the flood prone Terai districts. The flood component consists of four outputs which emphasis on sediment control and stabilization of hazard prone slopes and river banks through structural and non-structural measures; undertaking flood proofing and water and sanitation systems; training to relevant district line agency representatives on flood risk management and flood preparedness, and installation of an effective CBEWS in consultation and participation with concerned local communities and representatives.

Project operates in 12 Village Development Committees (VDCs) in five districts. This includes Chaurikharka, Namche, Khumjung (lies within the buffer zone of SNP) and Juving VDCs in Solukhumbu district for GLOF component. Under flood component, the project operates in four Terai districts i.e. Mahottari (Sarpallo and Nainhi VDCs), Siraha (Tulsipur and Pipra Pra Pi VDCs), Saptari (Dighawa and Pakari VDCs) and Udaypur (Hadiya and Jogidaha VDCs). This includes Ratu, Gagan, Khando and Triyuga (two tributaries i.e. Hadiya and Kong) river basins originated in Churia region.

A total of 12,690 vulnerable people residing in high risk settlements along 50 km downstream from Imja Lake are the direct beneficiaries from GLOF component. Similarly, 59,062 vulnerable population residing in the eight VDCs in Terai are expected to directly benefit under component II. CFGORRP emphasizes and pays special attention to the differential vulnerabilities of men, women, children, the elderly and any other marginalized groups, while executing activities.

By the end of 2017, DHM will be operating a GLOF Risk Monitoring System with a mechanism in place to communicate GLOF risk warnings to Ministry of Home Affairs (MoHA) / National Emergency Operation Center (NEOC) and District Disaster Relief Committee (DDRC) there by linking with the communities. Similarly, local and district level institutions are functional and supportive of the risk reduction activities, contributing to the overall sustainability of the project.



4. PROGRAMMATIC REVISIONS

Due to un-responsive bidding during 2015, the Imja Lake lowering works was rescheduled for 2016. Upon the approval from Project Executive Board (PEB), project started exploring the feasibility of involving the Nepal Army (NA) in lake lowering construction works as "Plan B". A concept note was prepared to approach and discuss with NA. After few rounds of discussions, NA expressed interest to undertake the task. On this basis, DHM as the implementing agency processed the approval process through MoPE to Ministry of Defense (MoD) to seek official engagement. A cabinet decision of the Government of Nepal dated 16th February paved the way for engaging Nepal Army in Imja Lake lowering works.

A Letter of Agreement (LoA) was signed by DHM with the Engineer Department of Nepal Army (ED-NA) on March 25, 2016 to materialize the Cabinet decision. LoA captures five key milestones for Imja Lake lowering works. The lake lowering work started in early April and completed in October 2016.

The budget for Imja Lake Lowering activity as per the design study was estimated as USD 2.4 million. However, situation changed during and after the six months long political disturbance in Terai region during September 2015 - February 2016. The border blockade for almost 5 months resulted into the shortage of basic essentials and hike of the price of commodities. As a result, the cost estimate of the Imja Lake lowering works also increased to USD 3 million during the time of contract signing with ED/NA.

Hence, Annual Work Plans (AWP) for 2016 and 2017 were minutely reviewed, scrutinized and prioritized to meet the budget shortfall. Process for VAT refund from Internal Revenue Department (IRD) has been initiated, however, the project has not received VAT refund till date. However, during the fourth quarter an additional \$ 319,000 from UNDP/TRAC source was utilized to undertake key prioritized activities of 2016.

5. NARRATIVE ON KEY RESULTS ACHIEVED IN 2016

Following table shows the linkage of outcome and output statements of the project:

Table 1: Outcome and Output Statements

Outcome Statement	Output Statement
Outcome 1: Risks of human and material losses from Glacial Lake Outburst Flooding (GLOF) events from Imja Lake reduced	Output 1.1: Water level of Imja Lake lowered through controlled drainage
	Output 1.2: Protocols for GLOF risk monitoring and maintenance of artificial drainage system of Imja Lake developed and implemented
	Output 1.3: Community-based GLOF Early Warning System developed and implemented
	Output 1.4: GLOF Risk Management Skills and Knowledge Institutionalized at Local and National Levels
Outcome 2: Human and material losses from recurrent flooding events in 4 flood-prone districts of the Tarai and Churia Range reduced	Output 2.1: Sediment control and stabilization of hazard-prone slopes & river banks through structural and non-structural mechanisms
	Output 2.2: Flood proofing of Water and Sanitation systems in selected VDCs in target river basins
	Output 2.3: Institutionalization of flood risk management skills and knowledge
	Output 2.4: Flood preparedness training for district and VDC representatives, NGOs, CBOs and local communities in 4 flood-prone districts

5.1 Progress towards the UNDAF/CPAP Outcomes

Table 2: Progress on Outcome Indicators

Outcome statement	Outcome indicator	Baseline	Cumulative Target for 2013 - 2017	Total target achieved till 2015	Milestone for 2016, if any	Achievement 2016	Year for the latest data	Source of data
UNDAF Outcome								
People living in areas vulnerable to climate change and disasters benefit from improved risk management and are more resilient to hazard-related shocks								
Indicators:								
# of districts covered by government-owned emergency operation networks for communicating relief needs								
# of VDCs meeting minimum criteria for disaster-resilient communities as defined by Nepal Risk Reduction Consortium Flagship 4 on integrated community-based disaster risk reduction/ disaster risk management								
Outcome 1: Risks of human and material losses from Glacial Lake Outburst Flooding (GLOF) events from Imja Lake reduced	Average depth of Imja lake	Average water depth of Lake is 58.8 m and highest water depth was 149.8 m in October 2014	Average depth of lake kept below danger level by ensuring average water depth during spring and summer months is at least 3 meters or more below the baseline level prior to the construction of the channel.	Lake lowering design and other associated studies such as Electric Resistivity Tomography (ERT), Ground Penetrating Radar (GPR) investigation and Bathymetric survey of the lake were completed on December 2014. The lake lowering work was rescheduled for 2016 due to unsuccessful bidding process during 2015.	Imja lake lowered by at least 3 meters	Engineer Department of Nepal Army undertook the Imja lowering works. By the end of October 2016, the water level of Imja Lake has been lowered by 3.4 meters thus reducing the imminent GLOF risk posed to the vulnerable communities living downstream of Imja Dudh Koshi river corridor.	2016	LOA Milestone Certification; Imja Lake lowering work completion report

Outcome statement	Outcome indicator	Baseline	Cumulative Target for 2013 - 2017	Total target achieved till 2015	Milestone for 2016, if any	Achievement 2016	Year for the latest data	Source of data
	Percentage of high risk settlements of Imja GLOF Impact Zone residents (including women, children and elderly people) with a clear understand of how the EWS works and what to do in the event of a GLOF	90% of the community have heard about GLOF about GLOF risk but are not prepared for it (Source: Regional GLOF Risk Reduction Project) X number of female and Y number of male are aware of the potential risk of GLOF and benefits of EWS.	100% residents from Solukhumbu district of the high risk settlements of the GLOF Impact Zone (within 50 km of outlet) understand how the EWS works and know what to do during the event of a GLOF, including men and women and elder residents.	Project has developed and trained 20 local resources (LRPs) on Training of Trainers on GLOF risk management. 15 CEBWS in vulnerable settlements installed and operationalized.	Automated GLOF EWS Installed and operationalized	The achievement on this indicator can only be articulated by the results of study/survey. Project plans to undertake outcome assessment study in 2017 to measure the achievements in the indicator. However, operationalization of GLOF automated EWS has been made. Vulnerable communities have been educated about the functions of the system during mock drill events and by disseminating messages through flyers, radio programs etc.	NA	Study/Survey reports
	Number of targeted institutions with increased capacity to minimize exposure to GLOF risks	No local institution to address or understand the GLOF risk which is creating unnecessary havoc of outburst. Limited access to information as well as Government level institution in the Khumbu region (Imja lake and surrounding) to	Number of representatives from Solukhumbu DDRC, Sagarmatha National Park, the Imja GLOF Risk Management Committee, and CBEWS Taskforces trained to manage and minimize GLOF risks. No. & type of information materials disseminated to	GLOF Risk Management Coordination Committee (GRMCC) has been formed in Namche to act as an apex body to coordinate Imja GLOF risk reduction activities.	Automated GLOF EWS Installed and operationalized Local institutions capacitated and mobilized.	The Automated GLOF EWS including hydro met sensors in the periphery of lake and sirens at six major vulnerable settlements have been installed and operationalized. Taskforces have been further equipped, capacitated and are being mobilized to		MTR report; Progress reports; work completion reports; project completion report

Outcome statement	Outcome indicator	Baseline	Cumulative Target for 2013 - 2017	Total target achieved till 2015	Milestone for 2016, if any	Achievement 2016	Year for the latest data	Source of data
		address or disseminate GLOF risks.	local and non-local people (i.e. tourists) by different agencies on GLOF risks, risk reduction measures and what to do in the event of a GLOF. By the end of the project, DHM is operating a GLOF Risk Monitoring System and has a mechanism in place to communicate GLOF risk warnings to MoHA and NEOC.	Taskforces have been formed, equipped, capacitated and operationalized to manage and minimize GLOF risks. About 7,510 units of Flyers, stickers, posters and audio video material containing information on GLOF risk reduction produced and distributed among locals and visitors.	IEC materials produced and distributed.	better respond and manage any GLOF events. From participating in 10 mock drill events, 494 community people, taskforce members and LRPs learned about approaches for reducing losses during any GLOF and other disasters. About 3,300 units of Flyers and information boards distributed/installed to sensitize locals and visitors on GLOF risk reduction. Radio programs to educate people on GLOF risk management aired in both local Sherpa and Nepali language through local FM stations.		Project completion report; progress reports of FCO
Outcome 2: Human and material losses from recurrent flooding events in 4 flood-prone districts of the Tarai and Churia	Number of additional people provided with access to safe water supply and basic sanitation services	Existing tube wells in 8 VDCs get flooded during the flooding season hindering the access to safe drinking water for 59,062 population residing in the villages. Water supply/ drainage system in 8 VDCs gets flooded making it	At least 70% population in 3 districts/6 VDCs have access to 24 elevated tube wells and/or a flood proofing drainage system.	35 Elevated Tube Wells (ETW) installed and operated in 2014. A total of about 4.5 km long FPDS constructed in Nainhi VDC expected to	Flood Drainage Proofing System constructed	59,062 Vulnerable communities including 27,682 women from the targeted eight VDCs have access to 35 ETWs for potable drinking water during flood and inundation. Construction/rehabilitation of additional 2.9 km of FPDS in Nainhi		

Outcome statement	Outcome indicator	Baseline	Cumulative Target for 2013 - 2017	Total target achieved till 2015	Milestone for 2016, if any	Achievement 2016	Year for the latest data	Source of data
Range reduced		<p>difficult for 59,062 population. There are no EWS in the 4 project target districts; 3 VDCs ((Mahisthan, Hattilet and Aurahi) communities in Mahottari district - Janagha River) have been trained in CBEWS UNDP/CDRMP programme</p> <p>The total population of the most flood-prone VDCs is 59,062. Weak system for flood risk management. DWIDP currently focuses only on construction works.</p>	100% of the population covered by CBEWS in all target flood prone river basins	<p>drain out the long-lasting stagnant water in the area during and after the monsoon season.</p> <p>A total of 59,062 vulnerable communities living in the eight targeted VDCs were being covered by the CBEWS in the five river basins. Likewise, additional 48,991 beneficiaries residing in seven upstream VDCs along Ratu, Gagan and Khado river basins will be benefited from the operationalization of EWS.</p>		<p>VDC in Mahottari and Pipra Prapi VDC in Siraha districts will drain the stagnant rain water from the village and help to improve the local sanitation.</p> <p>Vulnerable population of 8 targeted VDCs have been benefited from operationalization of the CBEWS in the targeted five river basins including the piloting CBEWS in Ratu River. Local disaster management committees and Taskforces in the respective river basins have been mobilized to operate the CBEWS and disseminate the early warning messages.</p>	2015	Study report, Project completion report

Outcome statement	Outcome indicator	Baseline	Cumulative Target for 2013 - 2017	Total target achieved till 2015	Milestone for 2016, if any	Achievement 2016	Year for the latest data	Source of data
	Number of targeted institutions with increased capacity to minimize exposure to flood risks in the Tarai & Churia Range	Limited trained staffs in DWIDP on flood risk management. DDRC is mostly involved in rescue and relief for post disaster work and their activity in the targeted districts is limited.	By the end of the project, at least 8 gender sensitive Village Disaster Management Plans prepared by the Village Disaster Risk Management Committees in the Terai & Churia Range. By the end of the project, at least two vulnerable VDCs of four districts will have CBEWSS and which are being effectively maintained by local communities (including women) under the leadership of the Village Management Committees.	8 LDRMCs, 35 CDMCs and 55 Taskforces formed and mobilized in communities.	Local institutions capacitated and mobilized.	Technical building of 65 national, district and VDC level officials from line agencies undertaken as part of institutionalization of knowledge and skills on FRM. 215 Taskforce members are retrained on First Aid and Light Search & Rescue. Sensitization and Awareness raising activities such as exposure visit, mock drill events and street drama demonstrations have been undertaken for LDRMCs, CDMCs and Taskforce members. Plans are underway to prepare the Village Disaster Risk Management Plans for all the 8 Targeted VDCs.	2016	Study reports, Project completion report

Progress towards Outcome 1:

For reducing the risk of human and material losses in downstream from Imja GLOF, the Project has successfully lowered the Imja Lake by 3.4 meters. This work is expected to reduce the hydrostatic pressure in moraine dam and reduce risks of moraine dam failure, hence reducing the potential GLOF hazard. A total of 12,690 local inhabitants residing in downstream and about 74,992 annual floating population (tourists/porters/guides) in the region are expected to be benefited from this initiative.

For GLOF preparedness and safety measures hydromet sensors and automated GLOF early warning systems have been operationalized in Imja Lake and its periphery. DHM will receive data and information through its web portal in order to communicate GLOF risk warnings to NEOC/ MoHA and DDRC. This information will be crucial in responding to GLOF events. Operationalization of automated EWS in six prime locations including 18 CBEWS downstream of Imja has enabled local communities to get GLOF risk warnings with sufficient lead time for preparedness.

Enhancing the technical capacities of 25 officials from line agencies and stakeholders in Kathmandu and Namche, has been expected to institutionalize the GLOF risk management skills and knowledge across the levels. Likewise, 494 locals (189 female, 447 janajatis and 18 dalits) including taskforce members and LPRs have been trained and sensitized on GLOF risk management through the conduction of mock events. Dissemination of GLOF risk management messages has been made through a combination of flyers, information boards and radio programs.

" Draining of Imja Lake: A great relief to the locals"

The Imja Lake, one of the fastest growing lake in the Hindu Kush Himalayan Region was posing threat of GLOF risk to the people living downstream. After the lake has been lowered by 3.4 meters, the people living in the high risk settlements in the Imja Dudh Koshi River corridor are much happier these days.

Ms. Phurwa Nima Sherpa, a resident of Pangboche, shares that successful draining of water volume from the Imja Lake is associated with feelings of safety and relief. Not only Phurwa, people in the downstream settlements of Imja Dudh Koshi River lived in constant fear of lake bursting, particularly after the mega earthquake and its recurring aftershocks. She narrates, "We used to have sleepless nights during the aftermath of mega earthquake. For now, the persistent fear has gone. I am really happy to see the commitment of related officials to complete this project."



Figure 2: Nawang checking the automated Siren installed in Phakding

Mr. Nawang Thome Sherpa, a 21-year-old young dynamic social worker from Phakding, is also a member of Taskforce and coordinator of First Aid sub group. He recalled the terrible situation during the mega earthquake and aftershocks, "we made a temporary shelter and lived under tents in open space and spent days to survive from potential GLOF. We are very happy for the lake has been lowered. It gives us a new life, no more fears now. We can sleep peacefully after decades of worry."

Nawang is an owner of the Liquid Bar, and engaged in tourism business. He opines that this initiation not only makes the locals safe, but thousands of visitors in the Khumbu region are safe from the risk of GLOF from Imja. He adds, "With safe evacuation center in place, skilled Taskforce members with necessary equipment and automated early warning siren, we hope we can better respond not only to GLOF but any other disaster"

Pasang Norbu Sherpa, chairperson of the Taskforce at Pangboche sheds light on other risk reduction interventions undertaken the project. "CFGORRP has created a platform for us to discuss and take actions for disaster risk reduction. We were trained and have been provided various first aid, light search and rescue and early warning equipment for dealing with disasters, from sirens and hammers to ropes and safety helmets. We organized mock drill exercises during 2015 and 2016. The exercises were much helpful to guide us during the real disasters if any".

Over the reporting period, 12 Taskforces have been formed, capacitated and equipped with first aid (FA), light search and rescue (LSAR) and early warning systems (EWS) in a bid to make resilient communities. Furthermore, the Local Resource Persons (LRPs) in vulnerable communities have been mobilized to educate and aware vulnerable communities on GLOF risk reduction and contributing towards making the communities resilient.

Progress towards Outcome 2:

Structural and not structural interventions undertaken in the targeted project areas have significantly contributed towards reducing human and material losses from flash floods through Churia originating river systems.

From the construction of about 13.4 km earthen embankment with gabion revetment and bioengineering works along Ratu, Gagan, Hadiya and Kong rivers will significantly contribute in reducing flash floods risks in Sarpallo, Tulsipur, Hadiya and Jogidaha VDCs. During this monsoon, 6-8 flooding events with a depth between 2-2.6 meters were recorded in the project area. This was the 40 year's extreme rainfall records in project area during monsoon this year. These embankments were instrumental in safeguarding the vulnerable settlements from these extreme flooding events and have saved life and properties. However, about 1300 meters of embankment stretch was damaged in Siraha which has been renovated during fourth quarter.

A total of 7.4 km of FPDS constructed in Nainhi VDC, Mahottari and Pipra Prapi VDC in Siraha over the years has worked well to drain logged water during monsoon this

Reduction in flood vulnerabilities

Dhati Tole in Hadiya VDC, Udayapur district is located alongside the Hadiya River, was the most vulnerable settlement in the VDC due to recurrent flash floods. About 300 families reside in the Dhati tole and majority of them are indigenous people mostly Chaudhary and Mushahar. Flash floods from Hadiya River had posed high risk to the settlement and about 5 hectares of farmland. Most of these families depend on agriculture for their livelihood.



Figure 3: Chandra Giri with his daughter

Chandra Giri, resident of Dhati Tole shared- "life was miserable then. Monsoon was like a curse. During one monsoon night, while sleeping, I heard a strange noise. When I got up, I saw flood entering into my house. I was very frightened but not shattered. I carried my daughter and ran out of the house towards the safer place". This was the situation of all the vulnerable communities. Although monsoon season is very important to farmers for agricultural production particularly paddy production, it is always difficult for them to cope with the floods triggered generally in every monsoon.

Realizing the difficulties faced by locals, the project supported for the construction of 500 meters of embankment along with gabion revetment and bioengineering measures. Now, with this structure in place, no flood was witnessed this season. The communities are now safe and could sleep well during nights. Chandra adds, "With the construction of strengthened embankment, we feel very safe now. We, the villagers are thankful to the project".

Balaram Basnet, a hotel entrepreneur narrates, "I run a small hotel for my livelihood. Two years ago on a monsoon night, when I was about to sleep, suddenly the flood entered into my room and everything was floating over the water. It washed away my hotel, leaving me completely helpless. But after the completion of sediment control measures, I have rebuilt my house at the same location and now I feel safe". He adds, "Our lands were valueless compared to the rate in other settlements of Hadiya VDC. Nowadays, the land price has shot up and the intensity of transaction has also increased. Cost of land in Dhati tole was a mere NRs. 625,000 per hectare before and has now reached to more than 6,250,000 with an increment of 10 times." Santa Devi Dahal, a local female resident says, "flood and monsoon were a curse for us. Children were not able to go to school during monsoon. Flood used to enter the house and inundate everything. But now, we feel safe and happy due to construction of embankment. Project also supports to raise awareness on FRM through trainings, mock drills and street drama events. The disaster risk management committees and Taskforces have been formed, capacitated and mobilized. We hope, with these systems in place, flood vulnerability of Dhati tole has been reduced".

year. Elevated Tube Wells have increased people's access to potable drinking water during monsoon and contributed for reduction of outbreaks of diarrheal and water borne diseases.

A total of 59,062 beneficiaries living in project areas and an additional 48,991 people from 7 upstream VDCs along the Ratu, Khado and Gagan rivers have benefited from the operationalization of EWS. CBFEWS operationalized in Ratu River basin has enabled communities in Mahottari for better prepare and response to any flood events.

Three safe evacuation centers have been constructed and operationalized with an aim to shelter the vulnerable communities during any flood or other disasters.

Sediment trap measures implemented in 11 small tributaries of Ratu upstream will aid to control sediment flow and reduce risks of flood and bank cutting.

Additional 65 national, district and VDC level officials (6 women) from line agencies trained on Sediment Monitoring, flood hazard modelling and FRM are expected to make full use of their knowledge towards minimizing exposure to flood risks. This will in turn contribute towards institutionalizing the Sediment Monitoring Protocols developed by the project.

The local institutions: 8 Local level Disaster Management Committees (LDRMCs), 35 Community level Disaster Risk Management Committees (CDMCs) and 75 Taskforces have been made operational in the targeted VDCs, and capacitated to perform as the frontline institutions during any disaster events.

In 2017, project will facilitate the LDRMCs to prepare Village level Disaster Risk Management Plans which will become a guiding document towards ensuring the sustainability of the project interventions.



Figure 4: Open channel with regulatory gate constructed for draining the water volume from Imja Lake



Figure 5: A stretch of embankment after the bioengineering works in Hadiya, Udayapur

5.2 Progress on Project Outputs

Table 3: Progress on Output Indicators

Output statement	Output indicator	Baseline	Cumulative Target for 2013 - 2017	Progress up to 2015	2016 Milestone	2016 Progress	Cumulative progress up to 2016	Means of verification
Output 1.1: Water level of Imja Lake lowered through controlled drainage	Imja lake lowered by at least 3 meters as per approved Implementation Management Plan	Average water depth of Lake is 58.8 m and highest water depth was 149.8 m in October 2014	Imja lake lowered by at least 3 meters as per approved Implementation Management Plan	Imja Lake lowering design and other associated studies completed. Lake lowering works rescheduled for 2016.	Imja lake lowered by at least 3 meters	By the end of October 2016, the Imja Lake has been lowered by 3.4 meters. After the Cabinet decision of Government for involving Nepal Army in Imja lake lowering works dated 16 th February 2016, a LoA was signed on March 25 to undertake Imja lake lowering works. Construction of an open channel with a design capacity of 15 cumecs with a regulatory structures has been completed in October. The discharge of water from lake began in end of September and got completed in October. The formal inauguration of the lake lowering works took place on November 23, 2016.	The final design for lake lowering completed. Based on the final design, the lake has been lowered by 3.4 meters.	Lake lowering design studies, Monitoring Reports, LOA documents and certification of technical reports by IC and STA.
Output 1.2 Protocols for GLOF monitoring and maintenance of artificial	System for regular monitoring of lake level changes developed and	-	System for regular monitoring of lake level changes developed and	-	Protocols for risk monitoring and maintenance	Development of Protocols for GLOF risk monitoring and maintenance of artificial drainage system of Imja Lake is underway. Project plans to finalize	Development of protocols is underway and will be completed by	

Output statement	Output indicator	Baseline	Cumulative Target for 2013 - 2017	Progress up to 2015	2016 Milestone	2016 Progress	Cumulative progress up to 2016	Means of verification
drainage system of Imja Lake developed and implemented	the system installed		the system installed		nce of artificial drainage system of Imja Lake developed	the documents by first quarter 2017.	first quarter 2017.	
Output 1.3 Community-based GLOF Warning System developed and implemented	Installation of CBEWS equipment and training to community and institutional representatives on its operation & maintenance	No Automated GLOF early warning system (EWS) in Imja Lake	CBEWS equipment procured and installed and training on its operation and maintenance conducted.	15 CBEWS comprising of manual river gauges, handheld sirens and mikes have been installed in strategic locations along Imja, Dudh Koshi River corridor. Prototypes for Smart card and Mobile Apps developed.	Automated GLOF EWS (hydro met sensors and six automate d EWS) installed and operation alized	Installation and operationalization of automated GLOF EWS including hydromet sensors in Imja and its periphery along with six automated sirens in major settlements in downstream of Imja Dudh Koshi river corridor have been completed. Additional three CBEWS have been operationalized in the vulnerable communities along Imja Dudh Koshi river corridor. Smart card has been launched in SNP during December, 2016.	Automated GLOF EWS operationalized in the periphery and downstream of the Imja lake. 18 CBEWS operationalized in vulnerable settlements along 50 km downstream of Imja Dudh Koshi River Corridor. Prototypes for Smart card developed and launched in SNP.	CBEWS Standard operating procedures; work completion report; Training reports
Output 1.4 GLOF Risk Management Skills and Knowledge Institutionalized at Local and National Levels	Increased capacity of i) locals, institutions (SNP and ii) DHM) in GLOF risk management		Increased capacity of i) SNP and ii) DHM in GLOF risk management	GRMCC formed 20 LRP s trained and mobilized 12 Taskforces have been formed,	Taskforce s capacitate d operation alized	Technical capacity of 25 officials and representatives from line agencies and stakeholders in Kathmandu and Namche has been enhanced on GLOF risk management.	Local institutions such as GRMCC including 12 Taskforces together with LRP s have	Training Reports, Assessment reports, Exit Strategy

Output statement	Output indicator	Baseline	Cumulative Target for 2013 - 2017	Progress up to 2015	2016 Milestone	2016 Progress	Cumulative progress up to 2016	Means of verification
				capacitated and mobilized.		Institutionalization of the GLOF risk management skills and knowledge among taskforce members, LRPs and community people have been realized by organizing 10 mock drill events at vulnerable settlements. Additional 3 sets of LSAR and 15 sets of FA equipment have been provided to Taskforces. A total of 3,300 English and Nepali flyers have been distributed among communities and visitors to sensitize and aware them on GLOF risk management.	been capacitated and mobilized at the local level for coordinating GLOF risk information and preparedness.	Task force meeting minutes.
Output 2.1 Sediment control and stabilization of hazard-prone slopes & river banks through structural and non-structural mechanisms	Structures constructed for Sediment control and stabilization in the targeted river basins	No structural measures exist in the identified locations in the targeted river basins	Sediment control and stabilization achieved	4.4 km embankment strengthened with gabion revetment and bioengineering works in Ratu, Gagan, Kong and Hadiya River Basins. 16 Sediment Monitoring Posts and 9 Sediment	Additional 5 Km long Earthen embankment along with gabion revetment and bioengineering works in Ratu, Gagan, Siraha and Udayapur. Sediment trap measures in 11 sediment laden tributaries of Ratu river system in upstream implemented.	A total of 8.9 km of embankment stretch with gabion revetment and bioengineering works have been completed in Ratu, Gagan, Hadiya and Kong river basins in Mahottari, Siraha and Udayapur. Sediment trap measures in 11 sediment laden tributaries of Ratu river system in upstream implemented.	About 13.4 km of embankment with bioengineering works completed in four targeted river basins. Sediment trap measures undertaken in 11 tributaries of Ratu upstream.	Technical reports; database and monitoring reports

Output statement	Output indicator	Baseline	Cumulative Target for 2013 - 2017	Progress up to 2015	2016 Milestone	2016 Progress	Cumulative progress up to 2016	Means of verification
Output 2.2 Flood proofing of Water and Sanitation systems in selected VDCs in target river basins	Elevated Tube Wells (ETWs) in targeted VDCs installed and operationalized in targeted 8 VDCs Flood Proofing Drainage System in two VDCs of Mahottari and Siraha implemented	No ETWs in the targeted VDCs No FPDS system exist in targeted VDCs in Siraha and Mahottari	Construction of 30 ETWs and implementation of FPDS	Monitoring Buckets installed 35 ETW constructed 4.5 km long FPDS rehabilitated in Nainhi, Mahottari	FPDS implemented in Mahottari and Siraha Districts	Construction of 2.9 km of Flood Proofing Drainage System (FPDS) undertaken in Mahottari and Siraha district.	35 ETWs installed in 8 targeted VDCs and 7.4 km long FPDS constructed in Mahottari and Siraha.	Technical Reports/Monitoring Reports, Contract agreements with Communities
Output 2.3 Institutionalization of flood risk management and skills knowledge	Methodologies for Sediment Monitoring for churia originating river systems established and institutionalized Institutionalization of Flood Risk Assessment and Sediment Monitoring among partners	No Sediment monitoring protocols exist No reliable sediment data from churia originating rivers exists	Increased capacity of DHM, DSCWM, DWIDP in Flood Risk Management and Sediment Monitoring	Two national level training to capacitate the officials from partner departments conducted SMP published, disseminated and institutionalized	Sediment monitoring Protocols internalized in DWIDP, DHM and DSCWM	To further internalize and institutionalize the Sediment Monitoring Protocols, a national level training on Sediment Monitoring and Flood Hazard Modelling for 22 officials collaborating partners was organized.	SMP published, disseminated and institutionalized. 72 national level officials trained on sediment monitoring and flood hazard modeling.	Two national level training to capacitate the officials from partner departments conducted SMP published, disseminated and

Output statement	Output indicator	Baseline	Cumulative Target for 2013 - 2017	Progress up to 2015	2016 Milestone	2016 Progress	Cumulative progress up to 2016	Means of verification
Output 2.4 Flood preparedness for training for VDC district and VDC representatives, NGOs, CBOs and local communities in 4 flood-prone districts	Vulnerable people benefited from the operationalization of the early warning systems Increased awareness level on flood risk management (FRM) in four flood-prone districts	No nonstructural measures on FRM exist in the targeted VDCs	CBEWS installed and training in Flood Preparedness conducted	Trainings conducted at local and District level on Flood risk management A total of 18 i.e. 15 CBEWS and 3 CBEWS installed in the five targeted River basins	Awareness raising activities implemented at local levels Safe evacuation centers constructed	Refresher trainings for 43 VDC and district level officials including 4 female on flood risk management completed. Capacity building trainings for 250 taskforce members including 93 female on FA and LSAR conducted. 5,615 vulnerable people observed and took part in street drama demonstrations, mock drill events and exposure visit and enhanced knowledge on Flood risk management. Three safe evacuation centers constructed and operationalized.	Trainings completed at VDC and district level. Early warning systems operationalized in 18 locations in 5 targeted river basins. Safe evacuation centers constructed. Capacity development activities such as trainings, exposure visit, mock drill events and street drama demonstrations conducted.	institutionalized CBEWS design report, Village Disaster Risk Management Plans, Baseline reports

Progress on Output 1.1: Water level of Imja Lake lowered through controlled drainage

In collaboration with Nepal Army, the project has successfully completed the technically challenging Imja GLOF risk reduction works at 5010 masl. This adaptation work is considered to have been undertaken at the highest altitude ever. The water level of the Imja Lake has been lowered by 3.4 meters, which was posing a serious threat of GLOF to the downstream communities. Hence, the lake lowering works has reduced the vulnerability of the downstream communities living within the 50 km downstream of Imja Dudh Koshi River corridor. The Engineer Department of Nepal Army was assigned to undertake the Imja Lake lowering works on March 25, 2016 as per the Cabinet Decision of the Government of Nepal.

An open channel with a design discharge capacity of 15 cumecs with a regulatory structures has been constructed to drain the water. The construction works was guided by a LoA, which has five milestones. The construction work began from April and completed in October 2016. A defect liability period of one year after the completion date has been made.

The Imja Lake lowering construction work has been officially inaugurated on November 23, jointly by the honorable Ministers from Ministry of Defense and Ministry of Population and Environment during a special function at Imja Lake.

National and International media houses made banner news on Imja Lake lowering works highlighting the collaborative efforts of Government of Nepal/DHM, UNDP and Nepal Army for accomplishing the technically challenging task at an altitude over 5000 masl, within a narrow window of time.



Figure 6: Honorable ministers jointly inaugurating the Imja Lake lowering construction works

Progress on Output 1.2: Protocols for GLOF risk monitoring and maintenance of artificial drainage system of Imja Lake developed and implemented

Protocols for GLOF risk monitoring and maintenance of artificial drainage system has been drafted which will be finalized by first quarter of 2017.

Progress on Output 1.3: Community-based GLOF Early Warning System developed and implemented

Hydro-met and GLOF Sensors in the periphery of Imja Lake and automated early warning sirens in six vulnerable settlements - Dengboche, Pangboche, Fungithanka, Jorsalle, Phakding and Ghat have been installed and operationalized during 2016. Over the project period, altogether 18 CBEWS comprising of manual gauges, sirens and hand mikes have been made operational in high risk settlements as part of preparedness measures.

With this system in place, the nearby communities in downstream of Imja - Dengboche, Pangboche and Fungithanka will get immediate GLOF warnings in



Figure 7: Hydrological & Meteorological stations with communication system installed for Imja Lake

case, so that they can prepare themselves for GLOF risk reduction. The rest three locations will be notified after verification and confirmation of GLOF events from DHM. They will get sufficient lead time of about one and half hours for preparations and dissemination of warnings for preparations and safe passage. Vulnerable people in downstream will benefit from the automated early warning messages and will be better prepared to respond to GLOF events and save human and material losses from such events. Project has supported to operationalize the well-equipped and trained EWS Taskforces in the vulnerable settlements who will be coordinating with the vulnerable people during GLOF event. Furthermore, as part of the preparedness plan, mock drill events were organized for two subsequent years in a bid to keep the task forces active.

Necessary works for integration of GLOF hydro-met information including a decision support system (DSS) into DHM web portal is underway. DHM will be operating a GLOF Risk Monitoring System with a mechanism in place to communicate GLOF risk warnings to MoHA and NEOC. Project prioritizes the work to be completed by first quarter 2017.

Progress on Output 1.4: GLOF Risk Management Skills and Knowledge Institutionalized at Local and National Levels

Over the years, project has built foundations for institutionalization of GLOF risk management skills and knowledge. Local institutions like GRMCC, LRPs and Taskforces have been established and provided with capacity building trainings on FA, LSAR and EWS as part of preparedness measures.

Project during 2016 has significantly contributed towards the institutionalization of GLOF risk management skills at various level. Involvement of Nepal Army in the Imja Lake lowering works in itself is a great step towards this direction. The technical capacity of the National entity has been built with the current undertaking Imja Lake lowering works. NA is the national institution that is mobilized during national disasters. Hence, building the capacity and transferring such knowledge and skill on GLOF risk management will ultimately help the Government efforts in addressing such risk reduction measures across the country. Likewise, 25 officials and representatives from line agencies in Kathmandu and Namche have been capacitated on GLOF risk management.

Around 494 people, taskforce members and LRPs including 189 women participated in 10 mock drill events and increased their awareness level on GLOF risk reduction preparedness. Taskforce members and LRPS have enhanced skills on using FA, LSAR and EW equipment from practical sessions. A Standard Operating Procedures (SOP) related to mobilization of Taskforces for GLOF risk reduction was developed and tested during the event.

Use of IEC materials have been made to raise awareness among vulnerable communities on GLOF risk management. GLOF Risk Management ToT Manual, 2016 has been published and disseminated as a knowledge product. Hoarding boards with location map depicting route of safe evacuation centers were placed in the trekking route. In case of any GLOF and other disaster, the communities and visitors in the region could gather in the 15 safer evacuation centers till rescue and relief operations could be made available. In addition, distribution of 3,300 copies different sets of flyers were distributed to disseminate the ongoing Imja Lake lowering works among local people and visitors. For wider coverage and



Figure 8: Drinking water and toilets built in Safe Evacuation center, Phungithanka

dissemination of GLOF risk reduction messages, local FM stations were contracted to air daily public service announcements and monthly radio programs.

Progress on Output 2.1: Sediment control and stabilization of hazard-prone slopes & river banks through structural and non-structural mechanisms

Construction of additional 8.9 km of embankment stretch with gabion revetment and bioengineering works in Ratu, Gagan, Hadiya and Kong river basins in Mahottari, Siraha and Udayapur has helped to reduce flood hazard risk to vulnerable communities. As of 2016, a total of 13.4 km of embankment stretches have been functional in these four river systems.

During monsoon this year, the embankment stretches along these river systems has safeguarded the vulnerable people from extreme flood events. The bioengineering measures has helped to enhance the strength of flood protection measures and make vulnerable communities understand the importance of vegetation for flood risk reduction. With the joint initiations of the local users committee, VDC Secretary and Hadiya VDC, in Udayapur has been declared as the Grazing free zone since 2015. This has resulted into the better protection and survival of saplings undertaken as part of the bio-engineering measures.

The sediment trap measures undertaken in 11 sediment laden tributaries at upstream of Ratu river system is expected to control sediment transport as well as to reduce risks of flood and bank cutting.

Community level construction committees were formed, capacitated and mobilized for executing the structural measures and made responsible for the operation and maintenance of the structures. This is expected to enhance sustainability of the interventions.

14 volunteers gauge readers regularly collected data on water levels, disseminated flood and rainfall related data, as well as collected runoff samplings from targeted river basins. Likewise, these volunteer gauge readers were provided refresher training for collecting sediment samples as per the Sediment Monitoring Protocols (SMP). Project plans to analyse and publish the sediment samples collected during monsoons of 2014, 2015 and 2016 to establish the sediment database from targeted river systems, and provide information related to sediment of Churia originating river systems during 2017.

Progress on Output 2.2: Flood proofing of Water and Sanitation systems in selected VDCs in target river basins

Vulnerable people in Nainhi and Pipra Prapi VDCs in Mahottari and Siraha districts have been benefited from the construction/rehabilitation of additional 2.7 km of flood proofing drainage system. The FPDS has helped to drain the rain water from the area. Due to this, the villagers get rid from long-lasting inundation problem faced during monsoon season. A total of 7.4 km of these FPDS structures also contribute towards improving the sanitation situation by reducing the risk of spreading of vector borne and diarrheal diseases.

36 elevated tube wells installed by the project have been wisely used and taken care by users committees. All the ETWs are functional in targeted eight VDCs. These ETWs have eased



Figure 9: Community engaged in construction of FPDS, Nainhi, Mahottari

peoples' access to the potable drinking water during monsoon, which is expected to help for decreasing the spread of water borne diseases during and after monsoon.

Progress on Output 2.3: Institutionalization of flood risk management skills and

Knowledge

At national and district level, 41 officials (2 female) from line agencies have been trained on Sediment Monitoring and Flood Hazard Modelling. This is expected to institutionalize the knowledge and skills of sediment monitoring methodologies as envisioned by SMP.

215 Taskforce members from Mahottari, Siraha, Saptari and Udayapur districts, have further refined their first aid and light search and rescue skills from taking part in refresher trainings during this year. These members are believed to be effectively mobilized during any flood events to reduce risks of human and material losses in their respective communities.

Progress on Output 2.4: Flood preparedness training for district and VDC representatives, NGOs, CBOs and local communities in 4 flood-prone districts

Altogether 24 VDC officials from targeted eight VDCs have been trained on Flood Risk Management (FRM). Similarly, 31 disaster risk management committees' members enhanced their understanding on significance of downstream upstream linkages in FRM and EWS by attending the exposure visit.

Early warning system for safeguarding lives and properties

With the installation and operationalization of CB-FEWS at 3 strategic locations along Ratu River in Mahottari, project aims to benefit vulnerable communities living along the targeted flood areas.

CBFEWS is a semi-automated system which generates flood warning signals and flood related data and information are manually disseminated by means of telecommunication, hand operated sirens and megaphones. Operationalizing these systems will link upstream and downstream communities by sharing real time flood related information. The system is found to be effective because of its simple, low cost and low tech semi-automated design. This is expected to improve preparedness, and lessen the impact of flash and catastrophic floods in the project areas thus reducing vulnerability.

Indal Mahato, a local resident of Sarpallo-7, Mahottari, explains how the vulnerable people were living with the flood risk during monsoon before. "People used to get in a ready position to run away with families due to recurrent flooding events from Jangha and Akushi River, tributaries of Ratu. In past, for entire monsoon, we could not sleep and used to wake up during nights. Now, as we can easily obtain flood related information in advance from our early warning systems, we can sleep in peace during the monsoon. A heavy flood reached Sarpallo in July 2016, but the early warning system enabled villagers and we gathered to safe evacuation center with their children, elderly, important documents, and livestock."

Mr. Mahendra Bikram Karki, the caretaker of the system installed in upstream-Lalgadh, Dhanusha, will receive the warning signal after the water level goes up in Ratu. Mahendra explains, "This system provides sufficient lead time of about 2.5 hours for necessary precautions to minimize potential flood impacts for the downstream communities. This monsoon, when flood went to danger level, I passed the information to the Taskforce and committees members in downstream for further dissemination of the information by using hand mikes, manual sirens and mobile phones. It has helped vulnerable people to gather in the safer place and reduce loss of lives and properties".



Figure 10 Mahendra reading the data received from the transmitter placed in river

Through participating in mock drills and observing street drama, a total of 5,584 community people (2298 women) including members from committees and taskforce, enhanced their knowledge and skills on FRM and are now better prepared to respond to any flood events at local level. Airing of flood related information through local FM's radio stations and installation of 50 information boards to disseminate FRM messages have been effective for educating people on flood risk reduction measures.

Besides, project constructed about 4.2 km long embankment stretches to further safeguard the communities. As a flood preparedness initiatives, six elevated tube wells and safe evacuation center have been constructed in the area.

The community based Flood Early Warning System in Ratu and CBEWS installed in targeted five river systems have been fully operationalized by the LDRMCs/CDMCs during this monsoon. This has helped to strengthen the network of the gauge readers in upstream and Taskforce members in downstream and improve information dissemination mechanism.

The project plans to replicate CBEWS in Gagan River basin, Siraha during 2017 in coordination with International Centre for Integrated Mountain Development (ICIMOD). CBEWS has been a successful model pilot tested in Ratu River basin in collaboration with ICIMOD during 2015. The system is found to be effective because of its simple low tech semi-automated design. The system is highly appreciated by the community. Telemetry will be integrated into the existing CBEWS from which the real time flood related data will be made available to the DHM web portal and the mass SMS alert will be send to the vulnerable communities though NTC and NCELL.

Three safe evacuation centres constructed and operationalized in Nainhi and Sarpallo VDCs in Mahottari and Tulsipur VDC in Siraha districts will provide safe shelter to the communities during flood and any other disaster.



Figure 11: Evacuation center built in Nainhi, Mahottari

6. BUDGET AND EXPENDITURE

The following table shows the output wise indicative budget and expenditure for 2016 and the sources of funds budgeted and utilization.

Table 4: Output wise annual budget and corresponding expenditure*

Amount in US\$

Output	Annual Budget	Annual Expenditure through project	Annual Expenditure through UNDP	Total Expenditure	Budget Utilization %
Output 1.1	2,758,969	2,737,153	33,165	2,770,318	101%
Output 1.2	0	0	0	0	0%
Output 1.3	99,550	15,838	57,269	73,107	73%
Output 1.4	120,021	93,091	6,497	99,588	83%
Outcome 1 - Total	2,978,540	2,846,082	96,931	2,943,013	99%

Output	Annual Budget	Annual Expenditure through project	Annual Expenditure through UNDP	Total Expenditure	Budget Utilization %
Output 2.1	587,200	562,382	0	562,382	96%
Output 2.2	7,550	6,748	0	6,748	89%
Output 2.3	42,500	39,013	0	39,013	92%
Output 2.4	188,430	157,095	297	157,392	84%
Outcome 2 - Total	825,680	765,238	297	765,535	93%
Operational cost**	378,592	125,899	271,649	397,548	105%
Grand Total	4,182,812	3,737,219	368,877	4,106,096	98%

*Actual expenditure figures are based on provisional Combined Delivery Report (CDR) received from UNDP on Jan. 19, 2017, CDR will be finalized by HQ in a system at the end of February, 2017, thus above reported expenditure figures may differ.

**Operational cost includes project's mid-term evaluation and project management cost.

Table 5: Sources of funds Budget and Utilization of the project period

<i>Amount in US\$</i>							
Source of Fund	Funding period	Total Project Budget	Expenditure up to 2015	Expenditure in 2016	Total expenditure till 2016	Total Budget utilization %	Budget Balance US\$
UNDP*	2013-2017	1,268,483	335,191	642,940	978,131	77%	290,352
Donor 1: GEF/LDCF	2013-2017	6,300,000	2,282,487	3,463,156	5,745,643	91%	554,357
Total		7,568,483	2,617,678	4,106,096	6,723,774	89%	844,709

*Project budget from UNDP/TRAC was revised and additional resource of US\$ 319,053 has been added, hence totaling to US\$ 1,268,483, whereas GEF/LDCF inputs remains unchanged.

Table 6: M&E Expenditure: In 2016, Project spend on M&E activities

Total spent on Monitoring	
☑ Costs associated with UNDP/project staff, consultants, project partners, supporting national statistical systems in designing project specific data collection methodologies (qualitative and quantitative), monitoring methods including stakeholder surveys and other qualitative methods, collection of data, analysis and dissemination of the findings to inform a project, either with project partners or to fulfill specific UNDP/project requirements (preferably the former).	USD 166,162
Total spent on Decentralized Evaluations	
☑ Costs associated in designing, implementing and disseminating evaluations for specific projects	USD 26,700

Combined total spent on M&E	USD 192,862 (about 5% of total budget)
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Narrative on Progress related to Budget and Expenditure

Budget expenditure analysis of the year 2016 shows that financial delivery of the project on outcome 1 is 99% i.e. US\$ 2,943,013, whereas in outcome 2 is 93% i.e. US\$ 765,535. The total budget for 2016 was US\$ 4,182,812 including project operational cost, whereas the total expenditure incurred is US\$ 3,737,219 through project and through UNDP US\$ 368,877 including operational, and cumulative expenditure come around US\$ 4,106,096 which is 98% of the allocated fund.

The budget for Imja Lake Lowering activity as per the design study was estimated to USD 2.4 million. However, the cost estimate of the Imja Lake lowering works increased to USD 3 million during the time of contract signing with ED/NA. Hence, AWP for 2016 has been minutely reviewed, scrutinized and prioritized to meet the budget shortfall. Process for VAT refund from Internal Revenue Department (IRD) was initiated during the end of 2016.

During the year 2016, N Bhattarai and Co. was appointed through UNDP to conduct the audit of financial transactions of the project for the year 2015 in March 2016. Based on the recommendations made by the audit report 2015, the project has prepared audit action plan and implemented accordingly.

Likewise, LDSA Associates was appointed by UNDP to conduct a spot check in December 2016 as an internal audit of the financial transactions covering the period from January to October 2016. The results of the spot check showed that the project is doing well in terms of overall financial performance and no major issues have been raised with the exception of documentation and to approval of the expenditure incurred in the Imja Lake lowering construction works.

7. CROSS CUTTING ISSUES

7.1 Targeting and voice/Participation of Target groups

Project has been working in two discrete geographic locations under two different outcomes/components. The first Outcome is being implemented in the vulnerable settlements of four VDCs along Imja Dudh Koshi River Corridor in Solukhumbu district- the high mountain region. Second Outcome is being implemented in the Mahottari, Siraha, Saptari and Udayapur districts located in the southern plains. The project intends to serve the vulnerable communities living in the eight VDCs along the five Churia originating river system.

The sites have been selected based on the risk and vulnerability analysis and consultations with stakeholders. Project considers the vulnerability of community people from the impacts of climate change. Hence, it aims to reduce climate induced risks such as GLOF and floods.

The G/HSEP study unveiled that a total of 87,682 people will benefit from GLOF risk reduction activities in Khumbu region. A total of 12,690 people (50% of them are female) residing along 50 km downstream from Imja Lake are the direct beneficiaries. Likewise, 74,992 tourists, trekkers, guides and porters visiting Khumbu region are also expected to benefit from project initiatives. The Socio Economic Baseline

Study conducted for component II revealed that 59,062 vulnerable people including 27,682 women living in the targeted eight VDCs will benefit from the interventions.

Project emphasizes on capacity building of local vulnerable communities in flood/GLOF risk management by engaging them in planning, implementation and managing the project activities. Capacity building through a combination of awareness and skills/knowledge transfer has been the main thrust for making the communities' climate resilient.

Project prioritizes the mainstreaming of women and marginalized people in the risk reduction initiatives considering the facts that women, poor and marginalized people tend to be more vulnerable from flood and GLOF risks. They also have limited and inadequate access to information and resources compared to other privileged groups owing to their cultural norms and other barriers.

7.2 Gender Equality, Women's Empowerment, and Social Inclusion

Involvement of women and marginalized people in project activities has been prioritized. Of the 12 trainings organized during 2016, 34% of participants were women. Similarly, 37% of them belonged to marginalized communities. An exposure visit for committee members to enhance their learning about community based early warning system was conducted. Of the total participants, 45% were women and 58% belonged to marginalized communities. Altogether, 6,709 people including 45% women participated and benefited from awareness raising events to enhance knowledge on GLOF and FRM.

Representation of women and marginalized groups at the institutional level has been the key priority. This has created opportunities for women and marginalized people to get involved in project interventions. 8 LDRMCs and 35 CDMCs have been formed, capacitated and made operational in which about 38% of women hold key positions, such as chairperson, secretary and treasurer. Similarly, 90 Taskforces have been formed, trained and made operational of which 38% of members are women and 41% belong to ethnic community, 17% Dalits and 16% are from marginalized castes. Women and marginalized groups in these institutions are reported to be actively participating in the meetings and support decision making.

Women members participate in risk reduction initiatives. Their active participation and performance during mock drill events showcased their capacities and determination to partake in risk reduction initiatives. 10 CDMCs headed by women have been actively engaged in planning, managing, record keeping and quality control while undertaking project interventions.

Besides, they are now confident and capable of communicating the project impacts with outsiders and even in front of cameras, which is a big change.

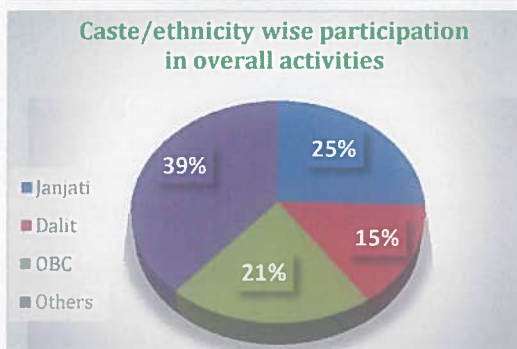
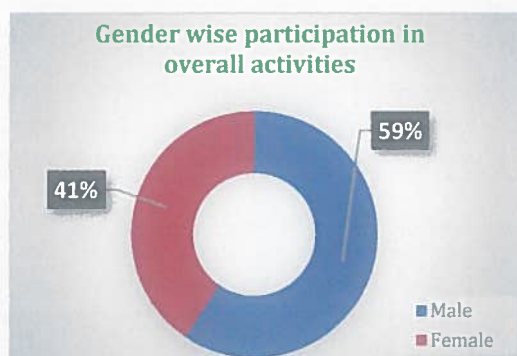


Figure 12: Taskforce women members during Mock Drill in Terai

Women members of these committees have become a role model for neighboring villages. Project has thus been instrumental in creating such platform for women and marginalized groups. Though, a study needs to be undertaken for documenting lessons and best practices of the project for reducing gender inequalities.

7.3 National Capacity Development

The technical capacity of the National entity 'Nepal Army' has been enhanced after the successful accomplishment of Imja Lake lowering works. NA is the national institution that is mobilized during national disasters. Hence, this capacity enhancement and experiences on GLOF risk reduction will ultimately help the Government efforts in addressing other GLOF risk reduction measures across the country.

Director General (DG) from DNPWC participated in business seminar held on April 2016 in USA, organized by US National Park Service of Department of Interiors. During the seminar, the DG, who is also the Project Board Member of CFGORRP/DHM shared the reformulated Management Plan of Sagarmatha National Park that had integrated Imja Lake lowering works into their plan. During the event, sister park relationship between Yosemite National Park, USA and Sagarmatha was formalized.

Likewise, Ms. Manju Sharma, Technical Advisory Group (TAG) member of CFGORRP/DHM from DWIDM participated in the Regional Conference on Risks and Solutions: Adaptation Frameworks for Water Resources Planning, Development and Management in South Asia held on July 2016 in Colombo, Sri Lanka. The learnings from the workshop is expected to bolster the technical capacity of DWIDM in dealing with CCA/DRR in the face of climate change. This also enhances the South - South cooperation among the SAARC members of the region.

Technical capacity of 22 Officials from collaborating partners on Flood Hazard Modelling and Sediment Monitoring has been enhanced from the national level training organized by the project. Officials from DSCWM, DHM, DWIDM, President Churia Terai Madhesh Conservation Development Board (PCTMCDB), Central Department of Environmental Science (CDES) and Institute of Engineering (IoE) - Tribhuvan University attended the training.

The Officials acquired knowledge and skills of analyzing potential flash flood, river cutting and inundation from the Churia originating river systems by using HEC RAS tool. Project expects that the trained officials will further institutionalize and internalize the Sediment Monitoring Protocols (SMP) by using them as a resource material during their in- house training.

After the training, five participants from PCTMCDB have teamed up and developed a proposal for undertaking the Sediment Monitoring and Flood Hazard Modelling of Pasaha River System, Bara district, central Nepal, by using the SMP.

A meeting with DSCWM was held during October 2016 to adopt the project's approach on airing of jingles from FM radio stations for disseminating Flood Risk Management awareness messages. DSCWM is planning to out scale nationwide airing of FRM and other messages in the form of jingles. Likewise, discussion also centred on for mobilizing the trained participants on Sediment Monitoring and Flood Hazard Modelling in handling the GIS lab within the DSCWM.

7.4 Sustainability

Since 2017 is the last year of project implementation, the Exit Strategy and Plan of the project has been finalized during December 2016. A series of consultations and discussions with the focal persons from

collaborative partners were held while finalizing the exit strategy. Implementation of the Exit Strategy is geared towards giving continuity of the project results.

Under Component I, project aims to integrate monitoring, operation and maintenance of Imja Lake and its structures including automated EWS in DHM's Annual Plan. Project will also develop a system to transfer the GLOF warnings from DHM web portal to the NEOC website. Project will mobilize communities on operation and maintenance of system and work towards integrating and aligning the Taskforces into local level institutional mechanisms. Plans are also underway to explore opportunities for levying fees for the operation and maintenance of the EWS from hydropower developers.

Under Component II, project plans to compile technical documents of structural measures and non-structural measures and share and inform with local level district line agencies. Project will develop Local level Disaster Risk Management Plans (LDRMPs) in coordination with LDRMCs/CDMCs and facilitate CDMCs and LDRMCs to establish functional linkages/networks with district level line agencies. Project will analyse and share sediment monitoring information of Churia originating rivers, document and share experiences and lessons learnt from implementing flash flood risk reduction initiatives.

Project is working towards documenting the lessons and experiences derived from implementation of GLOF/Flood Risk Management initiatives. In 2017, the project will publish the video documentary, other handbooks and booklets and share among the stakeholders as a process of knowledge documentation and sharing.

7.5 South-South and Triangular Cooperation

During January 2015, Climate Change Program Analyst and National Project Manager attended the Regional Planning meeting among LDCF/Special Climate Change Fund partners held in Bangkok. In the meeting, Bhutan shared its experience of having a contractor that was unable to perform the stipulated work, and eventually the Royal Bhutan Army was mobilized to complete the mitigation works.

Based on the learning, after the unresponsive bidding for lake lowering works during 2015, the project started exploring the feasibility of engaging Nepal Army in Lake lowering works. Eventually, the Imja Lake lowering works has been contracted to the Nepal Army. Hence, the learnings from Bhutan GLOF project was successfully applied in our case.

7.6 Partnerships

For component I, the project has partnered with Sagarmatha National Park and reformulated its Management plan 2016-2020. Imja Lake lowering activity has been a part of the SNP/Buffer Zone Management Plan. SNP Office was fully responsible in reformulating the SNP Management Plan which has been approved by DNPWC.

Project has also signed a Memorandum of Understanding (MoU) with DNPWC/SNP to undertake the Environmental Audit of the Imja construction works. The TOR for the same has been prepared in consultation with DNPWC/SNP.

Project consulted with Sagarmatha Pollution Control Committee (SPCC) for managing garbage and solid waste produced by workforce. SPCC Guidelines were followed for managing garbage and solid waste during the construction phase.

Partnership with Nepal Telecom has been established for operating VSAT in the Imja Lake periphery. This will help to operationalize the automated GLOF early warning system.

Regular Coordination & communication with ED/Nepal Army resulted in the timely completion of Imja Lake lowering works (within a period of six months' time).

Under Component II, the project has made an addendum on Letter of Intent with ICIMOD for replication of system in Gagan River in 2017. A telemetry based CBFEWS will be installed and operationalized in the Gagan. ICIMOD will also deliver necessary skills and trainings to focal points on operation and maintenance of these systems. Project expects that, this system will increase the effectiveness of early warning system in Gagan.

Technical Advisor (TA) from the project delivered a session on CBFEWS during an International Training on Disaster Risk Management, jointly organized by ICIMOD. Similarly, TA delivered a session on Flood Risk Assessment during another International Training on CBEWS organized by ICIMOD. Knowledge and experience of the project was shared during the session.

Partnership at local level with most popular FM radio stations were established to air awareness raising programs, public service announcements under both components.

7.7 Promotion of civic engagement

Sherpas, the local inhabitants of the Khumbu region have been engaged in the community level activities undertaken by the project. They regularly visited the lake lowering site to enquire about the ongoing work progress. As Imja is highly revered by Sherpa community, a religious ceremony was performed as per the local tradition prior to undertaking the lake lowering works. Similarly, a religious Pooja was solemnized by local Lamas during the formal inaugural ceremony of the Imja Lake lowering works. This is to ensure that project respects the cultural and religious values of local communities. With an aim to provide short term employment opportunities, project prioritized the involvement of local people during the construction period.

Under component II, discussion and consultations were held with vulnerable communities to solicit their approval and inputs during implementation of activities. In consultation with LDRMCs and CDMCs, various construction committees were formed and mobilized for the execution of structural & non-structural activities. To promote, transparency and accountability of the activities, public audits were conducted by construction committees. In addition, cost estimates and expenditure of activity were displayed through information boards. Chaudhary and Mushahar communities in Udayapur and other marginalized people and women were given priority in a bid to empower and build their technical capacities on flood risk management.

7.8 Expanding opportunities for youth

Project has given due emphasis for the participation and engagement of youth in its activities. The project has developed 20 LRPs, majority of them (more than 70%) are youths. These LRPs have been mobilized as active volunteers in educating local communities on GLOF Risk Management.

Likewise, 12 Taskforces with sub groups of FA, LSAR and EW, have been formed, capacitated and mobilized in the high risk settlements in downstream of Imja Lake. Out of total 132 members affiliated in Taskforces, majority (i.e. more than 60%) of them are youths.

Project equipped Taskforces with the necessary equipment on FA, LSAR and EW and imparted the skills and knowledge of handling these equipment. Project aims to mobilize skilled Taskforce members and LRPs as a frontline local institutions to respond any event of disaster in the communities.

For instance, LRPs and Taskforce members, were mobilized during July 2016, to support the victims of Landslide in Surke, Chaurikharka. The landslide had damaged five houses and put additional 24 additional houses at risk. During the landslide, trained members and LRPs were mobilized and used the Light Search and Rescue and First Aid equipment. Likewise, the operational Taskforces and LRPs in Benkar and Chumao rescued two dead bodies of porters from Imja Dudh Koshi River. Hence, the project has been successful for enhancing the capacities of local youths for making the communities more resilient.

7.9 Innovation

NA

7.10 Knowledge Management and Products

Project during 2016 has published "GLOF Risk Management ToT Manual, 2016" with an aim of developing a helpful resource material for operating/executing GLOF risk reduction awareness activities in future. This is the first Training of Trainers (ToT) manual on GLOF risk reduction, which will be helpful to train human resources to be mobilized for implementing awareness creating activities on GLOF risk reduction.

Project in 2014 organized a ToT training on GLOF Risk Management to train and develop the LRPs. During the training, the project realized that there is a lack resource materials for such training. Hence, the project developed a training package of GLOF Risk Management by hiring a Service Provider named Dynamics Pvt. Ltd. After the training, the project with an aim to document training package as an important Knowledge Product, planned to prepare and publish the GLOF Risk Management ToT Manual.

The manual in Nepali with simple language and illustrations is believed to be very helpful as a resource material for the LRPs while providing awareness building trainings at the community level.

The project distributed the manual to the LRPs and shared with line agencies at national level as a major knowledge product in the sector of GLOF risk management.

8. LESSONS LEARNED

- Undertaking risk reduction/adaptation works at an altitude of over 5000 masl is technically challenging & potentially risky. Hence, necessary backup plan for health related issues including transportation had been factored in. A combination of robust planning, management and monitoring of tasks: timely procurement and delivery of heavy equipment and construction materials, provision of alternative modes of transportation and effective management of workforce by a dedicated team of experts led to the timely completion of works without any hassles.
- Project prioritized the engagement of community level construction committees in the implementation of structural measures which resulted into cost efficiency, quality of works and ownership. For instance, in Nainhi and Pipra Prapi VDCs, a total length of 2.2 km of FPDS was planned to be constructed. However, within the allocated budget, the construction committee was able to construct 2.7 meters of FPDS with an increment of .5 km more than planned.
- Use of audio-visual materials to educate and aware vulnerable community on the importance of GLOF risk reduction measures prior to Mock Drill exercise was found very effective in generating attention and enthusiasm during exercise.

- Demonstration of street drama by employing local theatre artists in their local dialect was found very effective towards raising awareness and dissemination of messages at the local level.

9. IMPLEMENTATION ISSUES AND CHALLENGES

- Execution of the Imja Lake lowering works was the main challenge for the project which was rescheduled after the unresponsive bidding process in 2015. Upon the approval from project board, the project started exploring the feasibility of involving the Nepal Army in lake lowering construction works as Plan B. After rigorous efforts by CFGORRP/DHM, a cabinet decision on February 16, 2016 was made, which paved the way to involve Nepal Army in Imja Lake lowering works. Based on which, a LoA was signed during March and the Imja Lake lowering construction works has been completed on time.
- Prolonged political disturbance between September 2015 and February 2016 in the Terai region had resulted into the suspension of activities under component II. Planned activities for third and fourth quarters of 2015 were rescheduled for 2016. However, project completed all the preparatory works beforehand so the activities could be implemented as soon as situation improved. Due to necessary back-up plan, project was able to accomplish all the targeted activities during the first quarter of 2016.
- Due to the economic blockade, mega earthquake and political disturbance that the country faced during 2015, the cost of Imja Lake Lowering construction work increased to USD 3 million than the estimated amount of USD 2.4 million. Hence, the project faced a challenge to meet the budget shortfall. Therefore, plans for 2016 and 2017 were revisited, scrutinized and prioritized to meet the shortfall. However, an additional fund USD 319,000 through UNDP/TRAC was provided during the last quarter which was helpful to implement some prioritized activities. Additionally, necessary process for VAT refund from Internal Revenue Department (IRD) has been initiated. However, if the anticipated VAT refunds does not materialize then the planned activities for AWP 2017 might get delayed or not implemented within the first two quarters owing to the planned wrap up by June 2017.
- MTR has recommended the project to coordinate with SNP/Buffer Zone through DNPWC towards operationalization of the automated EWS and CBEWS. Despite of many attempts from the project side, Buffer Zone Management Committee remained reluctant to take responsibility of the Automated and community based EWS.

10. PRIORITIES FOR 2017

For both components, priority for 2017 will be focused on the implementation of Exit Strategy and Plan.

Under component 1, priority for 2017 will be on the operationalization of automated GLOF EWS to transfer the GLOF warnings from DHM web portal to the NEOC website. Project will develop and implement Imja GLOF monitoring protocols. Project plans to mobilize local communities for operation and safeguarding of the EWS and aligning the Taskforces to local level institutional mechanisms. Documentation and publications of project's good practices and learnings as knowledge products and Monitoring of Imja Lake construction works during the defect liability period in coordination with Nepal Army are priorities for 2017.

Under component II, priority will be on the maintenance of embankment stretches, rehabilitation of FPDS and replication of CBEWS in Gagan River. Similarly, preparation and handover of Local Disaster Risk Management Plans and network building of CDMC/LDRMCs with line agencies will be made. Likewise, documentation of knowledge products will also become a priority. Analysis and publication of sediment related database of Churia originating river systems including district level lessons/knowledge sharing events will also be undertaken.

At the operational level, 2017 will be the last year of project, hence safe exit of the project will be the priority. Other priorities include the undertakings assessment of outcome level indicators, Terminal Evaluation, Project completion report and hosting the national level learning's sharing workshop. Likewise, the operational closure and handover of assets will be done respectively at FCO, Lahan and PMU.

11.A SPECIFIC STORY

Nainhi VDC in Mahottari district, situated at Indo-Nepal border was one among many VDCs affected severely by flood from Ratu River. The whole VDC used to inundate during monsoon due to overflow of flood water from the Ratu River. In every monsoon, people in the Nainhi used to cut off from the mobility to the world outside the VDC. Hence, the monsoon every year was a curse for the villagers.

But now the situation has been dramatically changed over the past two years. The local vulnerable people teamed up together with the project to construct/rehabilitate a total of 6.6 km flood proofing drainage system in the VDC. The stretches of FPDS constructed in different phases during 2015 and 2016 have been aligned and networked in a way that it safely drains flood water from the area. The monsoon this year, was active. However, the FPDS has effectively performed to drain out the monsoon water from the VDC.

FPDS passes through 0.3 hectares of farm land in it. Out of 0.3 hectares of farm land, 0.16 hectares of farm land is in private ownership which belongs to 47 HHs. According to the valuation of land, the vulnerable communities have contributed the farm land worth equals to NRs. 4 million, for the sake of communal welfare.

Mr. Baran Mandal, inhabitants of Nainhi-8, has witnessed a drastic change in the situation this monsoon. He is grateful towards project for the support. However, he has contributed 0.004 hectares of his farmland to construct FDPS. He explains, "CFGORRP is the first of this kind of project we have in the VDC, which worked to reduce flood vulnerability. I am motivated by two major factors to donate land. The first is, in monsoon also I can cultivate the paddy in my field without fear of floods washing away the crop. And in winter, the canal can be used as an irrigation channel to pump water from the river to the farmland. We expect that the productivity of land will be increased. Second is to safeguard villagers from inundation and its consequences. Many houses in the monsoon used to damage due to inundation".

Not only Baran Mandal, there are Ramjeevan Yadav, Pabitra Yadav, Dharam Lal Kapad, Bhuneshwar Yadav and Birendra Mandal are among 47, who have donated their land for FPDS. All these land owners are happy to count their contribution for reducing the inundation risks in the VDC.

Ramjeevan explains, "Outbreaks of diarrheal diseases and increase in numbers of snake bite victims, were the consequences then. We hope the number of victims will be decreased after our village remains drier in monsoon". Talking about other benefit, Ramjeevan explains, "With no inundation in the area mobility during monsoon has been eased".

Baran is also a member of Light Search and Rescue Taskforce. Since 2015, he has been engaged in the group and learned skills of search and rescue. "With the trained Taskforces members and equipment in place, our confident level has been raised that we can effectively work to reduce human and material losses, if there would be any flood events in the village", says Baran.



Figure 13: Baran Mandal during Mock Drill Exercise

12. RISK AND ISSUE LOGS

Table 7: Risk Log Matrix

S.N	Description	Category (financial, political, operational, environmental, regulatory, security, strategic, other)	Likelihood of risk (scale of 1 to 5 with 5 being the most likely) A	Impact (scale of 1 to 5 with 5 being the highest impact) B	Risk factor (A x B)	Mitigation measures if risk occurs	Date risk is Identified	Last Updated	Status
1	Due to economic blockade, mega earthquake and political disturbance that the country faced during 2015, the cost of Imja Lake Lowering construction work has increased to USD 3 million at the time of Letter of Agreement signing with Nepal Army in March 2016, than the estimated amount of USD 2.4 million. Hence, the project has a challenge to meet the budget deficit for upcoming periods. Department of Hydrology & Meteorology and UNDP Country Office together are exploring options to address the budget deficit. If budget deficit could not be met, project will have to reduce programmatic activities under both components and come up with a withdrawal plan prior to October, 2017. Hence, plans for 2016 and 2017 have been prioritized and downsized according to available budget.	Financial	3	3	9	Process for VAT refund from Internal Revenue Department (IRD) has been initiated. The refund process has not materialized yet. Additional fund \$ 319,000 has been added from UNDP/TRAC source during November and some of the prioritized activities have been implemented.	June, 2016	December, 2016	Not a major issue but still holds relevance. No shortfalls of funds if VAT refund is realized within February.

13. PROGRESS AGAINST ANNUAL WORK PLAN 2016

EXPECTED OUTPUTS (Please include baseline, associated indicators and annual targets)	PLANNED ACTIVITIES (List key activities to be undertaken during the year which will contribute to the respective outputs)	Targets for Planned Activities	Annual achievements of Targets	Annual achievements of Targets in %	Donor Name	Approved budget (from the AWP 2016)	Amount spend (Actual Expenditure 2016)	% of expenditure against the approved budget	Remarks (if target not fully achieved)
Output 1 (First CPAP output): Project Outcome 1: Risks of human and material losses from Glacial Lake Outburst Flooding (GLOF) events from Imja Lake reduced									
Output 1 (First CPAP output): Project Outcome 1: Water level of Imja Lake lowered through controlled drainage									
Output 1 (First CPAP output): Project Outcome 1: Risks of human and material losses from Glacial Lake Outburst Flooding (GLOF) events from Imja Lake reduced;	1.1.1. Conduct regular TAG meetings.	Regular TAG meetings conducted	One TAG meeting conducted.	100%	GEF/LDCF	250.00	193.00	77.20%	
	1.1.4.a. Conduct environmental audit of Imja lake lowering work	Environmental assessing of Imja lake lowering works (environmentalist and sociologist)	MoU signed with DNPWC to undertake environmental audit	30%	GEF/LDCF	5,000.00	-	0.00%	DNPWC will complete environmental audit by first quarter of 2017.
	1.1.8.b. Provide support to strengthen evacuation centers (drinking water and toilet facilities)	Drinking water and sanitation facilities developed in two evacuation centers	Drinking water and sanitation facilities developed in two evacuation centers	100%	GEF/LDCF	5,600.00	5,627.00	100.48%	
	1.1.8. b. ii. Conduct visits for quality assurances during Imja lake lowering Construction.	IC conducts two field visits for quality assurance of construction activity.	IC undertook two field visits to Imja Lake lowering site for quality assurance	100%	GEF/LDCF	20,000.00	-	0.00%	Direct cost from UNDP and will be reflected in final CDR.
	1.1.8.iii. Support to improve health care facilities in Pangboche Health Post	Medical supplies and equipment's provided to improve health care facilities for workforce.	Medical support provided to Pangboche Health Post	100%	GEF/LDCF	1,600.00	1,607.00	100.44%	
	1.1.8 c. Undertake civil construction work for Imja Lake lowering.	Imja Lake lowered by more than 3 m.	Imja Lake lowered by 3.4 meters.	100%	GEF/LDCF	2,712,519.00	2,729,726.00	100.63%	
	Annual Targets: Imja lake lowered by at least 3 meters								

EXPECTED OUTPUTS (Please include baseline, associated indicators and annual targets)	PLANNED ACTIVITIES (List key activities to be undertaken during the year which will contribute to the respective outputs)	Targets for Planned Activities	Annual achievements of Targets	Annual achievements of Targets in %	Donor Name	Approved budget (from the AWP 2016)	Amount spend (Actual Expenditure 2016)	% of expenditure against the approved budget	Remarks (if target not fully achieved)
Automated GLOF EWS Installed and operationalized	1.1.8 e. iv. Share knowledge and lessons from Lake lowering construction.	Knowledge sharing meeting conducted with participation of at least 30% from vulnerable group and women: i. National stakeholders, SNP ii. Local stakeholders and others	Documentation of knowledge and learning from the lake lowering works is under progress.	20%	GEF/LDCF	4,000.00	-	0.00%	STA remained busy in Lake lowering works and coordinating training events, hence this activity has been carried forward for 2017
Automated GLOF EWS Installed and operationalized	1.1.8 f. Develop and publish Imja Lake monitoring protocol	Monitoring protocol developed	Draft Monitoring Protocol has been prepared. It will be finalized during 2017.		UNDP	5,000.00	-	0.00%	STA remained busy in Lake lowering works and coordinating training events, hence this activity has been carried forward for 2017
Local institutions capacitated and mobilized.									
Automated GLOF EWS Installed and operationalized	1.1.8 g. Develop Imja lake lowering manual/booklet	Manual developed	This has been taken forward for 2017.		UNDP	5,000.00	-	0.00%	STA remained busy in Lake lowering works and coordinating training events, hence this activity has been carried forward for 2017
Local institutions capacitated and mobilized.									
Output 1.3: Community-based GLOF Early Warning System developed and implemented with arrangements for real time GLOF warning arrangements.									
IEC materials produced and distributed.	1.3.1. a.i. Operationalize Taskforces and evacuation centers for GLOF disasters preparedness.	Evacuation centers and taskforces operationalized. 12 Taskforces meeting conducted.	No expenses was made as there was no demand from community. Taskforce conducted regular meetings.	100%	GEF/LDCF	1,050.00	15.00	1.43%	
	1.3.1 b. Support Taskforces for delivery of search & rescue, early warning and first-aid equipment.	LSAR, CBEWS and FA equipment procured in 2015, transported from Kathmandu to 15 evacuation centers.	Additional 3 LSAR and 12 FA equipment sets handed over to the Taskforces.	100%	GEF/LDCF	500.00	4,611.00	76.85%	
							447.00	89.40%	

EXPECTED OUTPUTS (Please include baseline, associated indicators and annual targets)	PLANNED ACTIVITIES (List key activities to be undertaken during the year which will contribute to the respective outputs)	Targets for Planned Activities	Annual achievements of Targets	Annual achievements of Targets in %	Donor Name	Approved budget (from the AWP 2016)	Amount spend (Actual Expenditure 2016)	% of expenditure against the approved budget	Remarks (if target not fully achieved)
	1.3.1 d. Operationalize automatic GLOF sensor system with community based EWS systems for GLOF warning and tracking visitors.	VSAT procured and installed for GLOF warnings and visitors tracking. VSAT equipment operationalized.	VSAT procured and installed for GLOF warnings. VSAT equipment operationalized.	100%	GEF/LDCF	600.00	465.00	77.50%	
	1.3.1 f. Conduct Mock drills in high risk settlements.	RFID supported to SNP for pilot testing of smartcard. Mock drills conducted in high risk settlements by mobilizing 12 taskforces and LRPs with participation of at least 30% from vulnerable group and women.	RFID supported to SNP and smart card pilot tested. Display board at Salleri, Solu has been taken forward for first quarter of 2017. 10 events of Mock Drills completed in high risk settlements.	100%	GEF/LDCF	1,500.00	-	0.00%	Payments will be made in first quarter 2017.
	1.3.1.g. Provide support for protection of EWS systems and civil construction.	VSAT installation, fencing of Hydro met sensor and civil constructions.	Fencing of Hydro met sensors and civil constructions completed. Final payment has been carried forward to first quarter of 2017.	0%	UNDP	10,000.00	-	0.00%	Payments will be made in first quarter 2017
	1.3.3 a. Procure and install automatic GLOF Early Warning System (AEWS) (ongoing activity).	AEWS installed and integrated with 18 CBEWS. (final installment payment provided)	AEWS installed and operationalized at Imja lake, its periphery and downstream and integrated with CBEWS.		UNDP	70,000.00	-	0.00%	Direct cost from UNDP and will be reflected in final CDR.
1.4 GLOF Risk Management Skills and Knowledge Institutionalized at Local and National Levels									

EXPECTED OUTPUTS (Please include baseline, associated indicators and annual targets)	PLANNED ACTIVITIES (List key activities to be undertaken during the year which will contribute to the respective outputs)	Targets for Planned Activities	Annual achievements of Targets	Annual achievements of Targets in %	Donor Name	Approved budget (from the AWP 2016)	Amount spend (Actual Expenditure 2016)	% of expenditure against the approved budget	Remarks (if target not fully achieved)
	1.4.1. a. Conduct GRMCC progress sharing meeting on Imja Lake lowering works.	One progress sharing meeting with GRMCC conducted	GRMCC meeting could not be conducted as planned.		GEF/LDCF	3,000.00	-	0.00%	BZMC remained reluctant to hold meeting despite of many attempts. Instead of BZMC, Task forces will be mobilized for further works.
	1.4.2 a Conduct capacity development trainings for DHM, DNPWC, SNP and stakeholders.	Capacity building trainings conducted to: i. National level for DHM, DNPWC and stakeholders. ii. Local level for SNP and stakeholders. on: i) GLOF warning system (hardware) and maintenance ii) Database management and uploading in web portal iii) GLOF disaster management.	Two trainings on GLOF risk management at Kathmandu and Namche for stakeholders completed.	100%	GEF/LDCF	4,750.00	3,411.00	71.81%	
	1.4.2 c. Airing of GLOF information through local FM stations.	Imja GLOF risk management information aired through Himal and Khumbu FM.	PSAs and monthly radio programs have been aired via local FM stations. 3300 copies of flyers on different themes published and distributed.	100%	GEF/LDCF	3,200.00	2,944.00	92.00%	
	1.4.5.d.i. Publish, disseminate and install IEC materials related to GLOF hazards	IEC materials produced, installed and disseminated.	3300 copies of flyers on different themes published and distributed. Hearing boards with maps of safe evacuation centers installed in trekking route.	100%	GEF/LDCF	5,000.00	6,082.00	121.64%	
	1.4.5.e. Design and develop smart card visitor management system for SNP with display board	Smart card with display boards installed at information center	Smart card design completed and launched in SNP. Installation of display boards in DDRC will be made first quarter 2017.	50%	GEF/LDCF	15,000.00	8,558.00	57.05%	

EXPECTED OUTPUTS (Please include baseline, indicators and annual targets)	PLANNED ACTIVITIES (List key activities to be undertaken during the year which will contribute to the respective outputs)	Targets for Planned Activities	Annual achievements of Targets	Annual achievements of Targets in %	Donor Name	Approved budget (from the AWP 2016)	Amount spend (Actual Expenditure 2016)	% of expenditure against the approved budget	Remarks (if target not fully achieved)
	1.4.5.f. Prepare video documentary of Imja construction works.	Video documentary of Imja construction work prepared.	Documentary production is at final stage. It will be completed during first month of 2017.	75%	GEF/LDCF	4,500.00	3,347.00	74.38%	
	1.4.6.f.v.i. Support for additional EWS equipment's	Support/equipment provided to Taskforce	Support provided for replacement of equipment for Taskforces as needed.		GEF/LDCF	5,000.00	5,068.00	101.36%	
	1.4.6. f.v.ii. Provide support to DNPWC to reformulate SNP Management Plan	Support Provided	Support provided to DNPWC to reformulate the SNP management plan.		GEF/LDCF	2,800.00	2,807.00	100.25%	
	1.4.11. Monitoring and field visit by PMU/DHM/MoPE/PEB members	Regular monitoring conducted.	Regular monitoring by PMU staff to the Khumbu region conducted as per need.	80%	GEF/LDCF	10,800.00	8,306.00	76.91%	
		Inauguration ceremony conducted	Visits to the Imja site for inaugural ceremony conducted.	100%	UNDP	5,500.00	-	0.00%	Direct cost from UNDP and will be reflected in final CDR.
	1.4.11.i. Support logistic and field gears for field based work	Logistic and field gears supported for field based activities in Imja.	Logistic and field gears supported for staff as per need.	100%	GEF/LDCF	2,000.00	199.00	9.95%	
	1.4.12. Undertake Emergency Rescue / Evacuations of professionals during emergencies.	Emergency rescue / evacuation undertaken on need basis.	No rescue/evacuation was required.	NA	GEF/LDCF	5,000.00	-	0.00%	
	1.4.14. Publication of RFP/RFQ	RRFP/RFQ published.	RRFP/RFQ published as per need.		GEF/LDCF	1,000.00	152.00	15.20%	
	1.4.15. Service contract-Individual	Staff cost provided	Staff cost expended.		GEF/LDCF	52,471.00	52,217.00	99.52%	

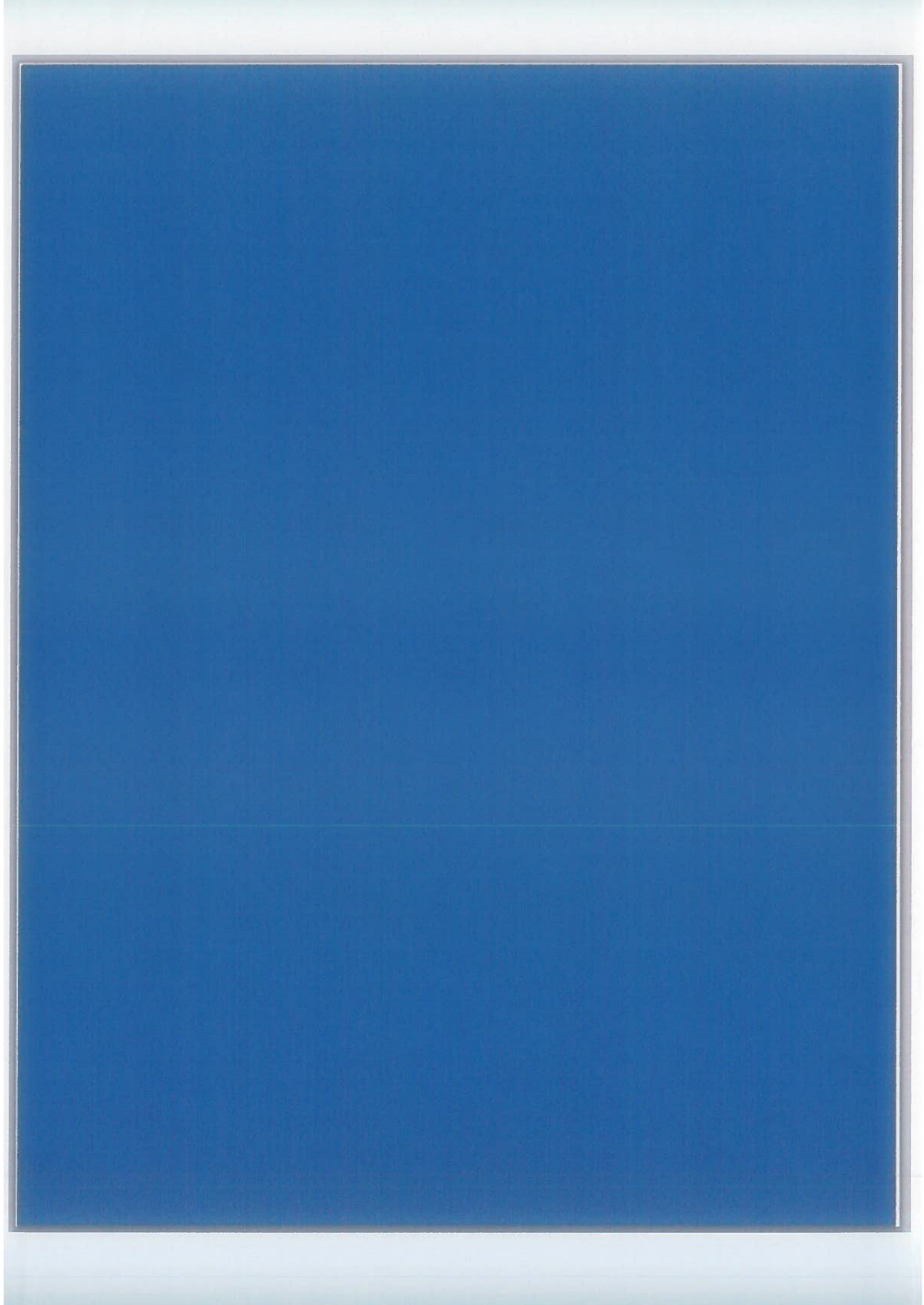
EXPECTED OUTPUTS (Please include baseline, associated indicators and annual targets)	PLANNED ACTIVITIES (List key activities to be undertaken during the year which will contribute to the respective outputs)	Targets for Planned Activities	Annual achievements of Targets	Annual achievements of Targets in %	Donor Name	Approved budget (from the AWP 2016)	Amount spend (Actual Expenditure 2016)	% of expenditure against the approved budget	Remarks (if target not fully achieved)
Sub Total Activity Result 1									
Output 2 (Second CPAP output)									
Output 2.1: Sediment control and stabilization of hazard-prone slopes & river banks through structural and non-structural mechanisms.									
Activity Result 2: Outcome 2: Human and material losses from recurrent flooding events in 4 flood-prone districts of the Terai and Churia Range reduced.	2.1.3.a Conduct regular consultative meetings with local communities to share progress, plans and activities.	Progress, plans and activities shared to local stakeholders and beneficiaries.	Consultative meetings conducted with communities to share progress, plans and activities.	100%	GEF/LDCF	800.00	369.00	46.13%	Due to austerity measures less resources were expended.
	2.1.4.b.9. Construct earthen embankment in Ratu, Gagan, Khando, Kong and Hadiya rivers.	Additional 5 km earthen embankment constructed in Sarpallo, Dhighwa, Hadiya and Jogidaha VDCs.	8.9 km of earthen embankment constructed in Sarpallo, Dhighwa, Hadiya and Jogidaha VDCs	178%	GEF/LDCF	146,000.00	135,732.00	92.97%	Additional budget from UNDP TRAC fund during November was invested to construct additional 3.9 km of embankment.
	2.1.4.b.10. Implement bio-engineering measures.	Bioengineering measures implemented in Sarpallo, Tulsipur, Dhighwa, Hadiya and Jogidaha VDCs.	Bioengineering works completed in 5.1 km stretch of embankment this year.	100%	GEF/LDCF	8,700.00	8,613.00	99.00%	
	2.1.4.b.11 Undertake sediment trap measures in upper reach of Ratu basin.	Sediment control measures undertaken upstream of Ratu river.	Sediment control measures undertaken in 11 sediment laden tributaries in upstream of Ratu river	100%	GEF/LDCF	40,000.00	38,666.00	96.67%	
	2.1.4.b.12 Engage communities to construct additional 5 km gabion revetment on earthen embankment	Additional gabion revetment works constructed in Ratu Tulsipur, Dhighwa, Hadiya and Jogidaha VDCs.	Ggabion revetment works completed in Ratu Tulsipur, Dhighwa, Hadiya and Jogidaha VDCs.	100%	UNDP	20,000.00	19,385.00	96.93%	
						GEF/LDCF	130,000.00	128,888.00	99.14%
					UNDP	172,000.00	167,223.00	97.22%	

EXPECTED OUTPUTS (Please include baseline, associated indicators and annual targets)	PLANNED ACTIVITIES (List key activities to be undertaken during the year which will contribute to the respective outputs)	Targets for Planned Activities	Annual achievements of Targets	Annual achievements of Targets in %	Donor Name	Approved budget (from the AWP 2016)	Amount spend (Actual Expenditure 2016)	% of expenditure against the approved budget	Remarks (if target not fully achieved)
	2.1.4. b.13 Undertake reconstruction of the extreme flood damaged embankments in the project districts.	Damaged embankments reconstructed.	Maintenance of damaged embankments completed.	100%	UNDP	60,000.00	56,793.00	94.66%	
	2.1.7.a Conduct annual district level consultative meeting to share progress and plan	One annual district level meeting in each district conducted.	Annual district level meetings conducted to share plan and progress with stakeholders.	100%	GEF/LDCF	1,000.00	607.00	60.70%	
	2.1.7.b. Facilitate communities to conduct networking meetings with district and VDC level stakeholders.	Four networking meetings conducted in four districts.	This activity has been taken forward for 2017.		GEF/LDCF	2,000.00	-	0.00%	
	2.1.10.a Undertake regular sediment data collection and analysis.	Monsoon sediment data from the five river basins obtained and analyzed.	Gauge readers have been mobilized to collect sediment data from targeted river systems.	100%	GEF/LDCF	3,700.00	2,941.00	79.49%	
	2.1.10.c Measure flood discharge at two different locations in each of Ratu, Gagan and Khando.	Flood discharge measured at six different locations.	Flood discharge measurement in targeted river system completed by a consulting firm.	100%	GEF/LDCF	2,500.00	2,705.00	108.20%	
	2.1.10.d Provide research grant to a Masters level student	Research grant provided to a Masters level student to quantify suspended sediment from a Churia originating river.	Research grant provided to a Masters level student from IOE to quantify suspended sediment from a Ratu river basin.	100%	GEF/LDCF	500.00	460.00	92.00%	
Annual Targets:	2.2. Flood Proofing of Water and Sanitation Systems in Selected VDCs in Target River Basins.								

EXPECTED OUTPUTS (Please include baseline, associated indicators and annual targets)	PLANNED ACTIVITIES (List key activities to be undertaken during the year which will contribute to the respective outputs)	Targets for Planned Activities	Annual achievements of Targets	Annual achievements of Targets in %	Donor Name	Approved budget (from the AWP 2016)	Amount spend (Actual Expenditure 2016)	% of expenditure against the approved budget	Remarks (if target not fully achieved)
Flood Drainage Proofing System constructed CBEWS operationalized in the targeted river basins. Local institutions capacitated and mobilized.	2.2.4.a. Support communities for maintenance of ETWs.	Regular maintenance of ETWs undertaken.	Maintenance support provided as per need.	100%	GEF/LDCF	250.00	103.00	41.20%	
	2.2.5.b Implement FPDS in Mahottari and Siraha Districts.	FPDS constructed and rehabilitated.	2.7 km of FPDS constructed and rehabilitated in Siraha and Mahottari.	100%	GEF/LDCF	7,300.00	6,645.00	91.03%	
	2.3: Institutionalization of flood risk management skills and knowledge.								
Local institutions capacitated and mobilized.	2.3.1.a Organize an exposure visit to share best practice on CBEWS.	One exposure visit organized.	LDRMCs/CDMCs members capacitated from the exposure visit.	100%	GEF/LDCF	2,000.00	2,026.00	101.30%	
	2.3.2.a. i. Conduct refresher training on Flood Risk Management (FRM) at 3 different levels (District, VDC, Gauge readers)	Three local level refresher trainings conducted	Refresher trainings for DDC and VDC level officials have been organized. Refresher training for gauge readers also conducted.	100%	GEF/LDCF	9,300.00	9,328.00	100.30%	
	2.3.2.c.1 Provide FA and LSAR training to the taskforce members.	Four refresher trainings organized for the 55 Taskforces.	Eight events of FA & LSAR trainings conducted in Siraha, Saptari, Mahottari and Udayapur districts.	100%	GEF/LDCF	18,200.00	15,850.00	87.09%	
	2.3.4.c Conduct joint field monitoring visit from district level line agencies.	District level field monitoring conducted.	Two monitoring visits by district level line agencies conducted in Udayapur and Mahottari districts.	66%	GEF/LDCF	500.00	272.00	54.40%	Monitoring visit planned in Siraha could not be conducted as officials from line agencies remained busy.

EXPECTED OUTPUTS (Please include baseline, indicators and annual targets)	PLANNED ACTIVITIES (List key activities to be undertaken during the year which will contribute to the respective outputs)	Targets for Planned Activities	Annual achievements of Targets	Annual achievements of Targets in %	Donor Name	Approved budget (from the AWP 2016)	Amount spend (Actual Expenditure 2016)	% of expenditure against the approved budget	Remarks (if target not fully achieved)
	2.3.4.d Conduct training on flood hazard modeling and sediment monitoring to national level officials from partners.	Training on flood hazard modeling and sediment monitoring conducted.	National level training on flood hazard modeling and sediment monitoring conducted for 22 officials from line agencies.	100%	UNDP	12,500.00	11,537.00	92.30%	
2.4. Flood preparedness training for district and VDC representatives, NGOs, CBOs and local communities in 4 flood-prone districts.									
	2.4.5.a Construct safe evacuation routes and emergency shelters for vulnerable communities.	3 (Nainhi, Sarpallo, Tulsipur/Pipra Pra Pi, Pakari/Dighwa) safe evacuation route and emergency shelters constructed including outer wall.	Three evacuation centers constructed in Siraha and Mahottari districts.	100%	GEF/LDCF	27,300.00	26,418.00	96.77%	
	2.4.6 Prepare gender sensitive and inclusive village-level Disaster Risk Management Plans (DRMPs)	Eight LDRMP prepared and developed	This activity has been carried forward for 2017.	0%	GEF/LDCF	5,600.00	-	0.00%	Two level of procurements failed and hence the final one is being carried out by UNDP.
	2.4.7.b Install Community Based Early Warning System.	15 CBEWS operationalized in four districts.	15 CBEWS operationalized in four districts by mobilizing CDMCs/LDRMCs.	100%	UNDP	24,000.00	-	0.00%	Evaluation process completed.
	2.4.7.b.1 Provide logistic support to local gauge readers.	Cell phone recharge cards provided to the volunteer gauge readers.	Recharge cards provided to the volunteer gauge readers during monsoon.	100%	GEF/LDCF	11,800.00	11,945.00	101.23%	
	2.4.9.b Continue airing flood related jingles in projects sites.	Flood related information composed and disseminated.	Flood risk management messages aired as jingles through FM stations.	100%	GEF/LDCF	1,500.00	807.00	53.80%	
	2.4.9.c Document time series project related stories on FRM from community members.	Project related stories documented.	Project related stories documented by hiring local consultant.	100%	GEF/LDCF	350.00	350.00	100.00%	

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	2.4.9.c. ii Develop, publish and disseminate flood related IEC materials.	IEC materials produced, installed and disseminated.	50 hoarding boards containing messages on FRM transported and installed.	100%	GEF/LDCF	2,200.00	2,455.00	109.89%	
	2.4.9.e Conduct regular flood mock drills at community level.	Mock drills conducted in the eight VDCs.	15 Mock Drill events conducted in eight targeted VDCs.	100%	GEF/LDCF	3,200.00	2,594.00	81.06%	
	2.4.9.g Conduct street drama on FRM in 12 different new locations of Mahottari, Saptari and Siraha.	FRM related street drama conducted in 10 new locations	Street drama demonstrations organized in 10 locations in Siraha, Saptari and Mahottari districts.	100%	GEF/LDCF	5,000.00	5,146.00	102.92%	
	2.4.9.h Conduct two day long educational, awareness programme on soil conservation to secondary school students during world environment day.	Essay and art competition conducted.	Essay competition among secondary level students conducted on world environment day.	100%	GEF/LDCF	1,200.00	1,155.00	96.25%	
	2.4.10. Monitoring and field visit by PEB members, focal persons and PMU	Field monitoring visits conducted.	Field monitoring visits conducted by PMU and FCO as per need.	85%	GEF/LDCF	4,000.00	3,364.00	84.10%	
	2.4.11. Publication of RFP/RFQ	Notices and information materials published.	RFP/RFQ published as per need.	100%	GEF/LDCF	1,000.00	825.00	82.50%	
	2.4.12. Service contract - Individual	Staff cost Provided	Staff cost provided as planned.	100%	GEF/LDCF	98,780.00	99,661.00	100.89%	
Sub Total Activity Result 2						825,680.00	765,238.00	92.68%	
GRAND TOTAL						3,804,220.00	3,611,320.00	94.93%	





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