

Protecting livelihoods and assets at risk from Glacial Lake Outburst Floods (GLOFs) and climate change-induced flooding in glacial river basins of Nepal

Environmental and Social Management Framework

1 May 2025

EXECUTIVE SUMMARY

Increasing atmospheric temperature is causing glaciers to melt worldwide. Glacier melting leads to the formation of glacial lakes. Many of these lakes are considered extremely dangerous as their dams are unstable and have the potential to burst — resulting in devastating Glacial Lake Outburst Floods (GLOFs). In Nepal, there are ~3,800 glaciers and ~2,000 glacial lakes, of these, 47 are considered potentially dangerous.

The Government of Nepal with support from UNDP, is formulating a project on adaptation to climate change impacts **“Protecting livelihoods and assets at risk from Glacial Lake Outburst Floods (GLOFs) and climate change-induced flooding in glacial river basins of Nepal”** for submission to the GCF. The project will seek to improve the resilience of vulnerable communities to climate change impacts.

Specifically, direct investments from the GCF combined with co-financing will be used to: i) reduce the impacts of a GLOF and its residual impacts on vulnerable communities; ii) promote the adoption of GLOF EWS measures among national- and local-level decision-makers to enhance rapid response to an impending GLOF; and iii) strengthen the technical and institutional capacity of the Government of Nepal and local communities to implement GLOF risk reduction measures through targeted training and awareness raising. The combined effect of project interventions will result in the adoption and implementation of a climate-resilient, integrated approach to GLOF risk reduction and flood management.

Four glacial lakes in Nepal have been prioritised for urgent adaptation action: Thulagi Glacial Lake in the Manang district; Lower Barun Glacial Lake in the Sankhuwasabha; Lumding Tsho Glacial Lake and Hongu 2 Glacial Lake in Solukhumbu district.

The proposed project will have the following activities:

- Output 1. Institutional and technical capacity strengthened to develop and integrate climate risk and hazard information into planning and development.
- Activity 1.1. Strengthen the knowledge base and technical capacities for improved climate research and risk reduction strategies.
- Activity 1.2. Develop public-private partnerships for sustainable investment in GLOF and flood risk information services.
- Output 2. Improved hazard monitoring and the generation of early warnings, including the dissemination of early warnings to local communities and important economic sectors leading to reduced economic loss and loss of human lives from GLOF events.
- Activity 2.1. Improve observation network density in GLOF watersheds to strengthen the technical capacity of DHM for the monitoring of climate hazard and risk.
- Activity 2.2. Develop and implement early warning systems to strengthen adaptive capacity and response to GLOFs and other climate hazards in vulnerable sectors and communities.
- Output 3. Reduced probability of GLOF events and flash floods, through disaster risk reduction measures implemented in priority glacial lake watersheds.
- Activity 3.1. Lower the levels of four of the highest risk glacial lakes.
- Activity 3.2. Construction of structural and non-structural measures (Civil and NbS/ Bioengineering) for the risk reduction of GLOF and flash flood.
- Activity 3.3. Implement Eco-disaster Risk Reduction and nature-based solutions to reduce the impact of GLOFs and flash floods.

As part of the project development and GCF funding proposal, initial assessments of environmental and social risks have been undertaken. Based on the risk assessment the project has been determined to be of Substantial risk, (GCF Category B) whereby 3 of the 14 identified risks have been rated as Substantial, specifically those relating to construction impacts on natural ecosystems (Risk 3), climate change vulnerability (Risk 7), and structural failure leading to destructive flooding (Risk 9). To manage the environmental and social risks and potential impacts, an Environmental and Social Management Framework (ESMF) has been developed.

The ESMF documents the environmental and social context in which the project will take place. It lists legislation, policies and treaties that are likely to apply to the project. Potential risks and impacts are identified, and the required management actions provided, including processes for screening sub-activities and the development of detailed Environmental and Social Management Plans.

The following tables summarise the potential impacts and proposed mitigation measures for each of the three outputs and sub-activities.

Output 1. Institutional and technical capacity strengthened to develop and integrate climate risk and hazard information into planning and development. I	
Potential Adverse Impacts	Mitigation Measures
<i>Activity 1.1. Strengthen the knowledge base and technical capacities for improved climate research and risk reduction strategies.</i>	
OHS risks associated with field data collection	Contracts include OHS requirements The project will support the procurement of safety equipment Trainers/extension staff supporting the implementation of activities will be trained on OHS good practices, protocols, and equipment
Discrimination of women	At least 50% of project beneficiaries will be women, including proportional representation from indigenous groups and marginalized communities (including Dalits) Gender Action Plan includes measures to promote women’s empowerment and gender equality within the framework of the project. Diverse groups of women need to be included, such as indigenous women, dalit women, non-dalit and non-IP women etc.
Discrimination or limited engagement of Indigenous Peoples, Dalits, and other marginalized groups.	Indigenous peoples and social inclusion planning Framework include measures for the engagement and participation of indigenous peoples. Invitation of indigenous federations, Dalit organizations and ethnic minority organizations to participate within the project management platform, as well as in the role of project partners supporting awareness raising, training processes and implementation activities. This would include the use of customary institutions of Indigenous Peoples. Promotion of proportional representation within project beneficiaries of indigenous peoples, Dalits, women from diverse groups, and marginalized communities. Knowledge and communication focused activities will include information from national experiences, international best practices as well as local and indigenous knowledge. The integration of knowledge from diverse actors into extension and knowledge sharing platforms will promote social inclusion and allow diverse groups to build on local experiences and knowledge.
Trained staff may not be retained by Department, resulting in a loss of corporate knowledge.	Train the trainer program will allow additional staff to be trained, thereby increasing the pool of talent in the government. Selection of staff/participants to consider inclusiveness and diversity. Training can also be extended to communities where appropriate and would be inclusive, considering the needs of women, minorities, and other disadvantaged groups.

<i>Activity 1.2. Develop public-private partnerships for sustainable investment in GLOF and flood risk information services.</i>	
Additional sectors that could benefit may be missed.	Stakeholder engagement to be broad and inclusive. Engagement to include government, private sector, and communities. Incentives to private sector participation should not be limited to specific sectors, but rather to anywhere benefits can be derived and willingness to participate is demonstrated.
Messaging may not meet needs of beneficiaries, in particular vulnerable groups	Stakeholder Engagement Plan to be developed and messaging to be based on broad beneficiary consultation and participation. A GRM provides a mechanism for anyone to raise concerns about the project. The GRM systemises the receipt, management and close out of complaints. Information to be accessible to multiple levels of user
Anticipated private sector investments may not be realized in a timely manner to support implementation.	Cooperation and coordination with the private sector will begin from project inception, and the project will implement awareness raising programs to help engage private sector actors.

Output 2. Improved hazard monitoring and the generation of early warnings, including the dissemination of early warnings to local communities and important economic sectors leading to reduced economic loss and loss of human lives from GLOF events

Potential Adverse Impacts	Mitigation Measures
<i>Activity 2.1. Improve observation network density in GLOF watersheds to strengthen the technical capacity of DHM for the monitoring of climate hazard and risk</i>	
Impacts associated with installation of equipment ie construction impacts: <ul style="list-style-type: none"> Physical issues: air, water, noise pollution, sed/erosion Biological issues: impacts on flora and fauna Socio-economic: GESI, labour force etc 	Existing sites and/or public land to be utilised – land requirements for DHM infrastructure small (eg 4x6m or 10x10m) thus providing flexibility in site selection. LAP will be prepared to clearly outline the steps required to utilise public or private land. If private land required (ie for installation of EWS equipment), the process of negotiation and compensation will occur. Land acquisition will be based on willing buyer/willing seller and the following conditions: (i) land markets or other opportunities for the productive investment of the sales income exist; (ii) the transaction occurs with the seller's informed consent; and (iii) the seller will be provided with fair compensation based on prevailing market values No compulsory acquisition will occur. In some instances, private partners have offered use of their private land for installation of EWS equipment as a form of co-finance, but it is not anticipated that there will be any change of ownership in these cases. ESIAs will be prepared for each watershed. ESIAs will assess potential impacts associated with the project including physical, biological, and social. The ESIAs will be prepared by a team with appropriate qualifications and experience eg flora and fauna specialists from National Parks, GESI and IP experts, engineering specialists from ICIMOD and government. Based on the outcomes of the ESIAs, ESMPs will be developed (one for each watershed) to ensure appropriate monitoring is in place.

	<p>Gender and Social Inclusion Plan</p> <p>IPPs will be developed to ensure coverage of IP issues</p> <p>GRM</p>
Training -selection of staff to be inclusive/equitable	<p>Training of trainers for the for the implementation of project activities should include men and women from indigenous groups, Dalit communities and other marginalized groups.</p> <p>LRPs who speak local languages should support trainers as well as awareness raising and information dissemination processes</p>
Maintenance costs and management may not be appropriately budgeted for	<p>Responsible parties are to be engaged in discussion regarding design and maintenance.</p> <p>O&M budgets to be determined and agreed</p> <p>Responsibilities for budget and implementation of work to be clear and transparent</p>
OHS issues associated with in-field maintenance of equipment	<p>ESMPs will include OHS requirements</p> <p>The project will support the procurement of safety equipment</p>
<i>Activity 2.2. Develop and implement early warning systems to strengthen adaptive capacity and response to GLOFs and other climate hazards in vulnerable sectors and communities</i>	
Selection of trainees within DHM discriminates	<p>Training to be inclusive and non-biased.</p> <p>Gender and Social Inclusion Action Plan and IPPF to be implemented.</p>
Information dissemination may not reach all people including illiterate people	<p>To ensure the widest dissemination local and accessible disclosure tools including audio-visual materials as well as flyers, brochures, videos and community radio broadcasts, and publications will be utilized in addition to other tools. The use of local/ethnic languages will be a focus of outreach documents. Furthermore, particular attention will be paid to farmers, indigenous peoples, illiterate or technologically illiterate people, people with hearing or visual disabilities, people with limited or no access to internet and other groups with special needs.</p> <p>Board/ committee members of community-based organizations, customary institutions, and Local Resource Persons will be local focal points who are able to facilitate ongoing communication with project beneficiaries.</p> <p>Local CSOs and project partners will be important to support information dissemination and communications at the local level, using locally accepted practices such as community-meetings, workshops, among other practices.</p>
OHS associated with field maintenance	<p>Operation and maintenance plan will include OHS requirements.</p> <p>The project will support the procurement of safety equipment.</p>
Lack of culturally appropriate practices, technical assistance and information dissemination for the implementation of Activity	<p>Indigenous Peoples Planning Framework includes measures to the engagement and participation of indigenous peoples within the framework of the project.</p> <p>Invitation of indigenous federations, Dalit organizations and other organizations representing marginalized communities, among other CSOs to participate within the project management platforms.</p>

	<p>Training of trainers for the consultations and workshops, as well as extension support should include men and women from indigenous groups, Dalit communities and other marginalized groups.</p> <p>The project GRM provides a mechanism by which anyone can raise concerns about the project.</p>
Physical impacts associated with installation of equipment eg towers and sirens	<p>The sites are relatively small, so significant adverse impacts are not expected, none the less, if any new accessways are required, then these will be assessed as part of the ESIA's by appropriately experienced specialists. Existing Rights of Way would be used. ESMPs will be developed to ensure appropriate mitigation measures and monitoring is in place.</p>
Community-based disaster response plans fail to be inclusive or take into account local issues/variables	<p>Plans to be developed in a participatory way with communities and ward leader. Participatory planning will help ensure that plans empower and engage highly vulnerable households, including indigenous peoples and Dalits.</p> <p>Emergency Response Procedures would include both workers and communities. The project activities include updating existing disaster response plans, which will benefit from the improved early warning systems that the project will provide as well as the physical structures that will reduce the risk of GLOFs and lessen the impacts of floods.</p> <p>Project to develop SEP.</p> <p>IPPF to ensure inclusion of IPs.</p>

Output 3. Reduced probability of GLOF events and flash floods, through disaster risk reduction measures implemented in priority glacial lake watersheds	
Potential Adverse Impacts	Mitigation Measures
Activity 3.1. Lower the levels of four of the highest risk glacial lakes.	
<p>The lowering of the glacial lakes and the construction of flood structures may result in the diversion of surface or water that could be destructive</p>	<p>Design assessment, including hydrologic modelling, has been undertaken. The structural measures proposed have been vetted, designed and specifications are based on thorough dam breach models and safety protocols. These measures have all been vetted by officials of DHM. An independent technical review and site assessment will be conducted prior to construction of these structural measures and adjustments will be made, as necessary. During implementation, the engineers of DHM will be placed on-site to supervise and monitor construction activities.</p> <p>The purpose of the lake lowering is to reduce the risk to populations downstream in the event of a GLOF, the beneficiaries are all those who live adjacent to the rivers downstream of the glacial lake. In terms of populations potentially impacted by construction, as the project sites are located away from the settlements, project activities during construction period will not bring adverse impact on the community regards to disruption of local water supply system. Based on the experience of lake lowering work in Imja, lake water is gradually drained out through a controlled drainage system to be built.</p>

	<p>Water flows currently occur downstream of the terminal moraines due to runoff and meltwater. The lowering of lakes would be controlled release, similar to flood events, until the design depth is reached. At that point the moraines will operate as a 'run of river dam' naturally allowing water that flows onto the lake to continue flowing downstream.</p> <p>Activities 3.1 and 3.2 involve physical structures to help mitigate flooding, including diversion of flood waters. Flood structures must not result in destructive diversion.</p> <p>Operation and maintenance plan for lowering to be prepared</p>
<p>Construction impacts (physical, biological and socio-economic)</p>	<p>ESIAs will be undertaken to identify and assess potential impacts. ESIAs to include all components of the lake lowering activity, eg physical works in terminal moraine, downstream works, access tracks, resource supply and stockpiling, worker accommodation and conditions. The ESIAs will be prepared by appropriately experienced and qualified professionals. ESIAs and ESMPs will be submitted to GCF for review.</p> <p>Critical habitats will be avoided by the project. The area where lake lowering works would be undertaken (the terminal moraines) consists entirely of rock, sediments and ice, there is limited habitat diversity in these areas ESIAs will include assessment of biodiversity and identify any management and mitigation measures required. Based on the findings of the ESIAs, ESMPs will be developed to ensure appropriate monitoring is in place. In the unlikely event that the need for a Biodiversity Action Plan is identified then it would be prepared by specialists.</p> <p>Project sites are located away from the settlements, project activities during construction period will not bring adverse impact on the community regards to disruption of local water supply system.</p> <p>All construction activities will take place during the dry season, to limit damage due to monsoon rains and to limit soil erosion and sedimentation.</p> <p>A Chance Finds Procedure shall be applied in the event of discovery of cultural heritage items during construction.</p>
<p>Lake lowering structures have a negative visual impact on the landscape</p>	<p>Stakeholder engagement should include discussions on potential visual impacts. Visual aids to be used to communicate likely impacts.</p> <p>Local materials to be used where possible to reduce visual impact.</p> <p>Designs to consider inclusion of culturally appropriate elements, such as mani walls/stones, prayer wheels, stupas or prayer flag poles.</p>
<p>Residual risk of GLOF remains</p>	<p>The purpose of the lake lowering is to reduce the risk to populations downstream in the event of a GLOF, the beneficiaries are all those who live adjacent to the rivers downstream of the glacial lake.</p> <p>Interventions will not totally remove risk of GLOFs but will reduce significantly.</p> <p>Designs take account of likely climate change scenarios.</p> <p>Dam break modelling to determine areas of impact if catastrophic failure and assist in identifying mitigation measure designs and identifying 'safe zones'/escape pathways as part of EWS.</p>

	<p>Communities to be consulted on level of risk that will remain and trained in EWS action plans (capacity building for EWS included as part of Activity 2.2)</p> <p>Additional interventions aim to address some of residual risk.</p> <p>Periodic safety inspections will be undertaken as part of monitoring and maintenance regime.</p> <p>Information from Output 3 to be provided to agencies to allow update of existing DRR plans</p>
<p>OHS risks associated with construction and maintenance</p>	<p>ESMPs to include requirements for OHS management.</p> <p>Earthquakes and landslides are an ever-present risk in the high Himalayas. This risk is recognised in the National Park Management Plans. ESMPs to include Emergency Response Procedures.</p> <p>Labour management procedure to be put in place. Responsible parties and project contractors must:</p> <ul style="list-style-type: none"> • not employ workers under minimum age for employment as determined by national law for applicable parties subject to national law and consistent with the ILO Convention No. 138 • not allow children under the age of 18 to perform work in connection with or arising from the project activities which, by its nature or the circumstances in which it is carried out, is likely to harm his/her health, safety or morals, • not allow children under the age of 18, in connection with project activities, perform work that is likely to interfere with their compulsory education or be harmful to their physical, mental, spiritual, moral or social development. • take immediate steps to correct and remedy any cases where child labour is identified. <p>Guidance on hazardous work to be prohibited in connection with the project shall derive from the ILO Worst Forms of Child Labour Convention, 1999 (No. 182) and ILO Worst Forms of Child Labour Recommendation, 1999 (No. 190).</p> <p>Examples of hazardous work activities prohibited for children include work: (a) with exposure to physical, psychological or sexual abuse; (b) underground, underwater, working at heights or in confined spaces; (c) with dangerous machinery, equipment or tools, or involving handling or transport of heavy loads; (d) in unhealthy environments exposing children to hazardous substances, agents, or processes, or to temperatures, noise or vibration damaging to health; or (e) under particularly difficult conditions such as work for long hours, during the night or in unreasonable confinement on the premises of the employer.</p> <p>To this end, the project shall ensure that contractors have adequate systems in place to check workers' ages and keep records of the dates of birth of all employees and ensure that these requirements are complied with.</p> <p>Further, the project shall:</p>

	<ul style="list-style-type: none"> • screen the capacity of locally available pool of workforce with aim to avoid or reduce labour influx by hiring from the local pool of workforce, • ensure Environmental Manager responsibilities regarding oversight of, and reporting on, labour influx and workers' camps (if any), • provide influx workers with training on prevention and response to Gender-Based Violence, • develop effective reporting and response protocol and referrals for safe and confidential survivor assistance, • allow workers to raise their concerns (safety, discontent, maltreatment or else) through the Grievance Mechanism, complaints forms are to be present on the construction site, and promptly investigate allegations of Gender-Based Violence related to project activities <p>Workers to use appropriate PPE and appropriate training to be provided</p> <p>Contractors to prepare Construction Emergency Medical Plans</p> <p>Operation and maintenance plan to be prepared</p> <p>Institutional arrangements for periodic safety inspections, emergency procedures, and overall operation and maintenance (O&M) of GLOF risk reduction, flood risk reduction, and plantation activities will be integrated within existing mandates of DHM and DoFSC. A structured coordination mechanism will be established to ensure effective collaboration among these agencies, local governments, and community-based organizations. The budget for safety inspections, security measures, and emergency procedures will be incorporated within the existing O&M costs, leveraging available resources without requiring additional allocations. Additionally, existing emergency response health facilities at the sites and other emergency protocols will be utilized to enhance preparedness and response during the project period as well as for O&M activities. Periodic capacity-building programs and inter-agency coordination will be set up for the post project scenario and will be clearly reflected in the Exit Strategy.</p>
<p>IPs could be adversely impacted due to the importance of lakes and other landscape features to them culturally</p>	<p>Early and ongoing engagement with national indigenous bodies (eg Nepal Federation of Indigenous Nationalities (NEFIN) and National Indigenous Women's Federation (NIWF). IPs have been engaged in the project development and continue to do so.</p> <p>IPPF to ensure appropriate engagement of IPs and their inclusion in project planning and implementation.</p> <p>As communities consider lakes and mountains as abodes of gods and goddesses, they have deep respect and a spiritual connection with their environment. Therefore, respecting their beliefs and seeking permission and advice on how to ensure that deities believed to be living in the lakes are not disturbed will be obtained prior to undertaking any work. It is critical that local customs are adhered to and that local sentiments are respected.</p> <p>The following is an example of some of the actions that were undertaken during the field investigations undertaken for the design phase:</p> <ul style="list-style-type: none"> • consultation with community leaders during planning of field trips to determine concerns and actions required

	<ul style="list-style-type: none"> • religious figures from the community, local leaders, and community members invited to help perform rituals to appease the goddess (Nhepu) and seek her blessings. • only start work after carrying out the rituals. • undertake daily rituals eg burning incense and juniper leaves as part of a cleansing ceremony. <p>Enumerating the total number of IPs associated with the project, will be an ongoing task as detailed site selection and design of infrastructure. Further discussions with IPs and the development of IPPs will occur as part of implementation. The IPPs will detail the measures (as identified by the IPs) that will be required to be undertaken to protect cultural heritage – physical and spiritual.</p>
<p>Sourcing of materials and generation of waste</p>	<p>ESIAs to include consideration of materials and waste generated. Waste to be managed (removed) from construction sites in accordance with National Parks Management Plan. ESMPs to include Waste Management Sub-Plans.</p> <p>Materials to be sourced locally where possible. Lake lowering will include reusing materials excavated, so no loose spoil dumps will remain. Design includes downstream bank stabilisation and/or armouring. Area of disturbance will also be minimal. It is anticipated that rock material removed from the moraines to lower the lakes will be utilised within other works such as spillways, training wall, accessways etc. This will reduce the material needed to be sourced.</p> <p>Only authorised/legal sources of material to be used.</p> <p>Procurement to comply with the Nepal Public Procurement Act 2063 (2007), which addresses issues such as transparency, competitiveness and accountability, and financial administration. A labour management plan will also be prepared.</p> <p>ESMPs would include a Waste Management Plan. Water quality impacts will be managed via Sediment and Erosion Management sub-plans. The ESMPs, and their sub-plans, would be based on the findings of the ESIAs</p>
<p>Project activities could have a negative impact on the two National Parks in which works will occur.</p>	<p>National Park Plans of Management will be reviewed and confirmed to include works to lakes. If any amendments are required, the amendment will follow National Parks processes and will be done in such a way so that revision does not result in other unintended exploitation or damaging activities within the park ie revision will be specific to the proposed GCF works.</p> <p>ESIAs will be undertaken to assess the impacts of the proposed works to ensure that any impacts are acceptable and manageable. Based on the findings of the ESIAs, ESMPs will be developed to ensure appropriate mitigation and monitoring is in place.</p>
<p>Social impacts associated with influx of workers (construction)</p>	<p>Local workers to be used where possible. A Labour Management Plan will be prepared.</p> <p>Demands on local infrastructure to be considered prior to importing workers – contractor may be required to provide additional facilities (eg medical, accommodation or food).</p> <p>All activities will be closely monitored in coordination with the Department of National Parks and Wildlife Conservation potentially with support from the</p>

	<p>Nepal Army as per the government policy. This will reduce risk of poaching and increase readiness in event of natural disaster.</p> <p>GRM includes mechanism for managing GBV/SEAH</p>
<p><i>Activity 3.2. Construction of structural and non-structural measures (Civil and NbS/ Bioengineering) for the risk reduction of GLOF and flash flood</i></p>	
<p>Rights holders, particularly IPs, may not have the capacity to claim their rights.</p>	<p>Implement SEP and GRM</p> <p>Confirm land tenure at all project sites as part of detailed site survey during implementation stage (public land proposed to be used).</p> <p>A Land Acquisition plan (LAP) will be prepared. LAP to describe process for identification of tenure and process for obtaining legal use of land (note, there will be no compulsory land acquisition). The application of the LAP and IPP will ensure that land is unencumbered and that restriction of access to natural resources or traditional uses is not adversely impacted.</p> <p>In the case of use of public lands in the project, some sites legally belong to the local government but are managed by the IPs as prevailing customary rights of the IPs on the land. In a very few instances, where communities have customary user rights (but not legal ownership rights) these areas will be avoided, as far as possible. In cases where it is unavoidable, the local government will facilitate consultations with affected communities and use land for project activities only upon agreement of the affected communities. UNDP will work closely with the IP and other users who depend on public land to ensure that any public land used by the project is unencumbered and/or not land on which local livelihoods depend.</p> <p>IPPs to be developed for each catchment</p>
<p>Increased flows could damage interventions and/or downstream infrastructure</p>	<p>Designs have taken account of likely climate change parameters</p> <p>Modelling to test effectiveness of interventions under different scenarios has been undertaken</p> <p>Apply lessons learnt from Imja Lake project eg water to gradually drain out through a controlled drainage system.</p> <p>Periodic safety inspections will be undertaken as part of monitoring and maintenance regime.</p>
<p>Construction impacts (physical, biological, socio-economic)</p>	<p>Project sites are located away from the settlements, project activities during construction period will not bring adverse impact on the community regards to disruption of local water supply system.</p> <p>ESMPs to be developed.</p> <p>ESMPs to include a sediment and erosion plan.</p> <p>Heritage items, such as mani walls, stupas etc to be protected</p>
<p>Sourcing of materials and generation of waste</p>	<p>ESIAs to include consideration of materials and waste generated.</p> <p>Materials to be sourced locally where possible. As much as possible excavated material will be reused in the construction of the structural elements of the project. – mainly in filling open areas and gullies and in stabilization of river channel embankments, including with bio-engineering measures and plantation on embankments.</p> <p>Only authorised/legal sources of material to be used.</p>

<p>Land required for installation of infrastructure</p>	<p>Public land to be prioritised. The majority (>95%) of construction activities will be on public land. Use of private land would be a last resort and due to sites on public land not being technically feasible. The sites where actual lake lowering work will be conducted are away from human settlements and the land there belongs to the government. So, there is no issue of land acquisition and compensation.</p> <p>For physical small-scale interventions downstream – these areas fall mostly in government-owned land. However, where private land is required for construction work, standard practices will be followed, as in the case for other projects – i.e. local governments will facilitate community negotiations, especially engaging affected private landowners.</p> <p>Public lands where communities have customary user rights (but not legal ownership rights) will be avoided, as far as possible. In cases where it is unavoidable, the local government will facilitate consultations with affected communities and use land for project activities only upon agreement of the affected communities. UNDP will work closely with the IP and other users who depend on public land to ensure that any public land used by the project is unencumbered and/or not land on which local livelihoods depend.</p> <p>LAP to be prepared which will outline processes required for use of public land, communal land and private land. Where access to private land required, the negotiations by PMU will be conducted and appropriate compensation agreed. Use/ acquisition of private land will be based on willing buyer/willing seller and the following conditions will be followed: (i) land markets or other opportunities for the productive investment of the sales income exist; (ii) the transaction took place with the seller's informed consent; and (iii) the seller was provided with fair compensation based on prevailing market values.</p> <p>No forced private land acquisitions.</p> <p>Community will be involved and provide approval to the use of any communal lands. Where it is indigenous peoples customary land, then FPIC mechanism to be applied.</p>
<p>Potential conflicts over the selection of priority intervention areas.</p>	<p>Stakeholder Engagement Plan will be developed.</p> <p>Decision making is transparent and supporting studies and information (reports, minutes from consultations and workshops) are made publicly available.</p> <p>Strong focus on capacity building within all project activities will help raise awareness of climate risks and the link between climate change and natural disasters with unsustainable natural resource management, as well as the benefits of climate-resilient infrastructure.</p> <p>In the case where any household/ person feels discriminated against or has a problem with the project, they can access the project's grievance redress mechanism.</p>
<p><i>Activity 3.3. Implement Eco-disaster Risk Reduction and nature-based solutions to reduce the impact of GLOFs and flash floods.</i></p>	
<p>Land required for installation of eco-DRR and nature-based solutions</p>	<p>Public land to be prioritised.</p> <p>No forced private land acquisitions.</p>

	Community should be involved and agree to the use of any communal lands. LAP will be developed to describe the processes for obtaining legal right to use land use. Where it is indigenous peoples customary land, then FPIC mechanism to be applied. The application of the LAP and IPP will ensure that land is unencumbered and that restriction of access to natural resources or traditional uses is not adversely impacted,
Construction impacts (physical, biological, and socio-economic)	Scoped ESIA's to assess potential impacts ESMPs to be developed.
Site-specific impacts due to the inappropriate planting of tree species based on site conditions.	Guidance on site-species matching will be developed for project sites, providing information on key tree species that are adapted to the area and their ideal site-conditions. In addition to native species, the project will only promote tree species which are already locally adapted and do not pose a risk to the local biodiversity. It will ensure compliance with Nepal's Forestry Policy (2015). If required, a Biodiversity Action Plan will be prepared.
In practice it may be challenging to have equal participation due to gender discrimination, especially against women from indigenous groups and marginalized minority groups	At least 50% of project beneficiaries will be women, promoting proportional representation from indigenous groups, Dalit communities and other marginalized groups. Gender and Social Inclusion Action Plan includes measures to promote women's empowerment and gender equality within the framework of the project. The plan includes detailed measures that target women and aims to empower them within the project, whilst considering their differentiated contexts and vulnerabilities. PMU M&E specialist and PPSU staff will regularly monitor the implementation of the GAP and work together with CSOs and other actors to strengthen the engagement of women within the project.
Sourcing of materials eg trees and shrubs, rock	The establishment of small-scale community-based nurseries will comply with relevant national legislation (Forest Policy, Environmental Protection Act), and will promote equitable hiring policies ensuring equitable employment opportunities for women, indigenous peoples, Dalits and other marginalized households. Existing legal quarries or other sources of rock only to be used.

The ESMF lists the following additional safeguard measures that will apply to the project during the implementation, including but not limited to:

- Gender Action Plan (prepared)
- Environmental and Social Impact Assessments (planned)
- Environmental and Social Management Plans (planned)
- Stakeholder Engagement Plan (prepared)
- Grievance Redress Mechanism (prepared)
- Indigenous Peoples Planning Framework (prepared)
- Indigenous Peoples Plans (planned)
- Operation and Maintenance Plans (planned)
- OHS plan (planned)
- Labour Management Plan (planned)



- Land Acquisition Plan (planned)
- Contractor Medical Emergency Management Plan (planned)
- Additional sub-plans anticipated to be included as part of the ESMP are:
- Sediment and erosion management plan
- Monitoring plan
- Biodiversity Action Plan
- Waste Management Plan
- GBV/SEAH Management Plan (may be included as part of the GAP)
- Heritage Management Plan
- Emergency Response Plan

The ESMF identifies the need for ongoing stakeholder engagement and provides an outline of the Stakeholder Engagement Plan as well as a Grievance Redress Mechanism. Important stakeholders in the project include indigenous peoples who live in and around the project areas. An Indigenous Peoples Planning Framework outlines the actions that will be required to ensure that the project is inclusive of indigenous peoples.

Through the application of the ESMF and its required sub-plans, the potential adverse impacts of the project can be minimised and managed within acceptable limits. The visible implementation of the safeguard measures and practices described in the ESMF provides the opportunity for awareness raising and capacity building with respect to good environmental and social practices within the stakeholder groups associated with this project.



Annex VI (b) – Environmental and Social Management Framework

Green Climate Fund Funding Proposal

