



Assessment Report

Project Name: Mai Beni



Project Sponsor: Urja Developers Pvt Ltd/
Samling Power Company Ltd.

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Pelle Bågesund and Anamaya Upadhyay

Draft Report Date: 29 July, 2023



Cover page photo: The Mai Beni powerhouse (front centre), staff residences, offices, kitchen etc. (front left) and penstock/surge shaft (top centre).

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The findings in this report are based on an independent assessment conducted in compliance with the processes set out in the Hydropower Sustainability Assurance System.



A. Assessment Details

Project sponsor	Urja Developers Pvt Ltd/Samling Power Company Ltd
Assessor(s)	Dr Bernt Rydgren, Accredited Lead Assessor, Sweco International, Linköping, Sweden; Pelle Bågesund, Accredited Assessor, Sweco International, Stockholm, Sweden; Anamaya Upadhyay, Provisionally Accredited Assessor, Hydro-Consult Engineering Ltd., Kathmandu, Nepal
Observers	Amina Kadyrzhanova, IHAS staff
Assessment objective	Certification of the Mai Beni Hydropower Project against the Hydropower Sustainability Standard
Assessment dates	14 May – 21 May, 2023
Assessment report date	29 July, 2023
Prepared for	Urja Developers Pvt Ltd/Samling Power Company Ltd
Limitations of the assessment	<p>The updated IEE (UIEE) produced for the project (2019) is very generic and often lacks attention to project-specific assessment aspects. This has resulted in the unfortunate situation that the avoidance/minimisation/mitigation/compensation actions included as part of the Environmental and Social Management Plan (ESMP) have little reasonable bearing on the project. This has created some rather difficult decisions on the part of the assessors in regard to compliance aspects of the assessment.</p> <p>Not a limitation per se, but a point of information to the reader: Nepal uses a different calendar, the “Bikram Sambat”, or “BS” for short. This does not break between years at western New Year, but rather in approximately mid-April. This means that for any western date, 56 years and 8 months should be added to arrive at the approximate corresponding BS date.</p>

B. Project Details

Project name	Mai Beni
Country	Nepal
Location	26° 53' 09" N to 26° 55' 41" N; 87° 55' 38" E to 87° 57' 30" E on the Mai Khola (river), near Ilam Bazar
Purpose	To sustainably generate hydroelectric power contributing to the energy demand and development of the country and the region
Developer / Owner	Samling Power Co. Ltd
Financer(s)	Nepal SBI Bank Limited (Lead Bank) and Siddhartha Bank Limited (Participating Bank)
Installed capacity (MW)	9.51
Construction start date (planned or actual)	May, 2018
Commercial operations date (planned or actual)	17 September, 2021
Annual average generation (GWh/year)	53.3
Associated infrastructure: road(s) (length)	Upgrading of 4.76 km of the road from Tilkeni to the headworks of the project
Transmission lines and sub-stations (names, lengths and capacities)	3.1-km 33-kV line
Total cost (USD m)	15.9 (based on exchange rate in May 2023 – cost in NPR 2 050 million)
Annual operating costs (USD m)	USD 0.147 million (NPR 19 360 000)
Project development cost not including transmission (USD m)	USD 15.12 million (NPR 1 982 911 018)
Transmission costs for project development (USD m)	USD 0.51 million (NPR 67 088 982)
Specific investment cost (million USD/MW)	1.64
Levelized energy cost (USD/kWh)	Not available but a coarse approximation based on 25 years of 53.3 GWh/year of generation yields approximately 0.0145 USD/kWh
Dam type	Semi-permanent concrete-infilled boulder weir
Dam height (m)	N/A
Dam length at crest (m)	25
Units (number, type, MW)	2; Horizontal Francis Turbines; 4.75 MW each
Reservoir area at Full Supply Level (FSL) (km ²)	Approximately 0.002 (intake pond is approximately 80 x 25 metres at weir over-topping water level)
Average net head at FSL (m)	135
Average flow (m ³ /s)	9.
Design flow (m ³ /s)	8.4
Load factor	40%
Number of physically displaced households	1

Power density (W/m ²)	> 9 000, well above meaningful as an indicator of reservoir-induced GHG emissions
Emissions intensity (gCO ₂ e/kWh)	N/A
Contacts/website	https://spcl.com.np/

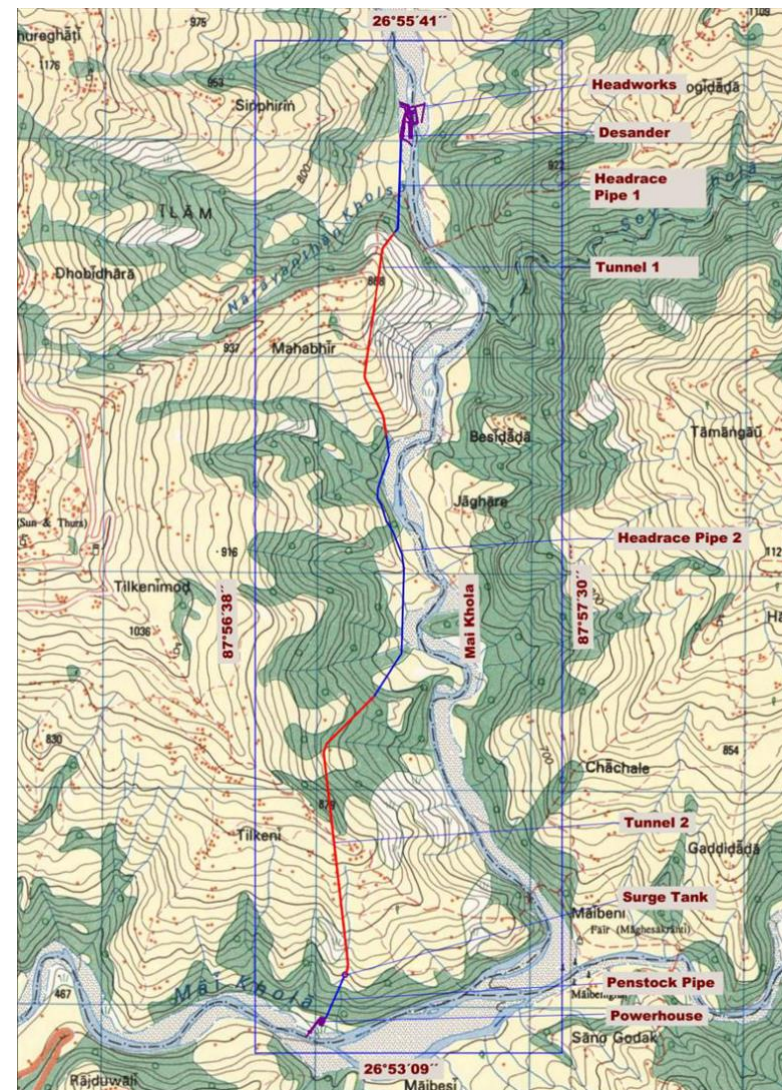
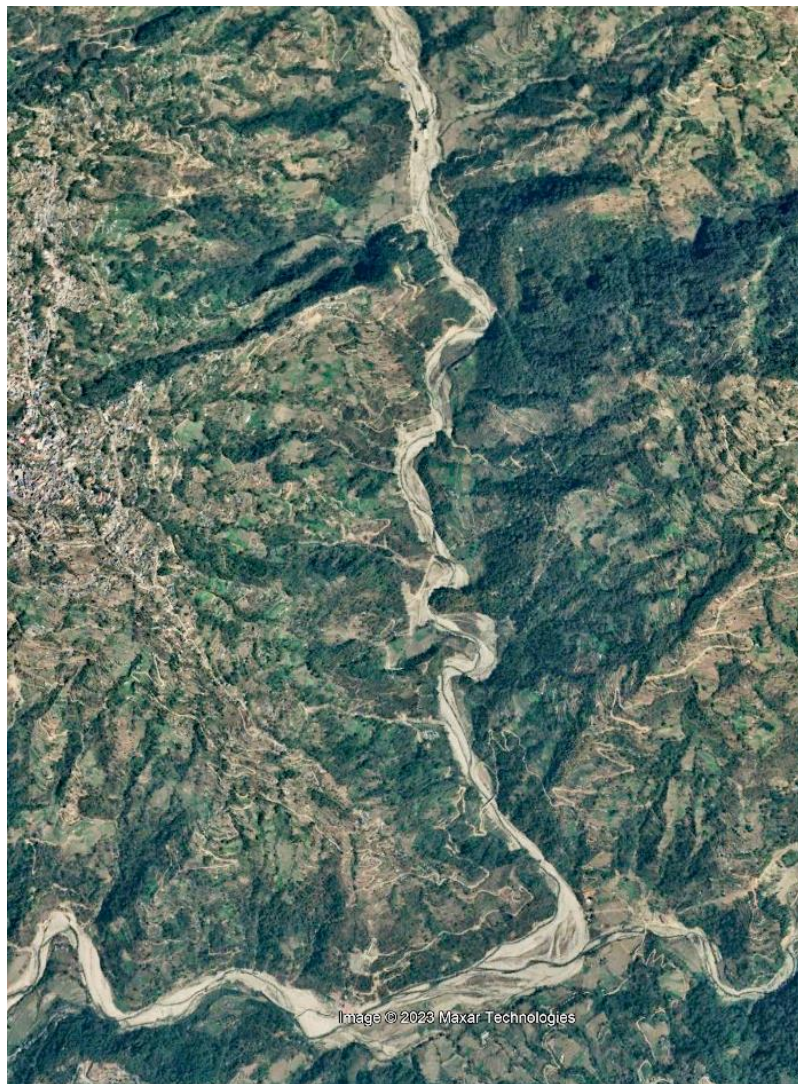
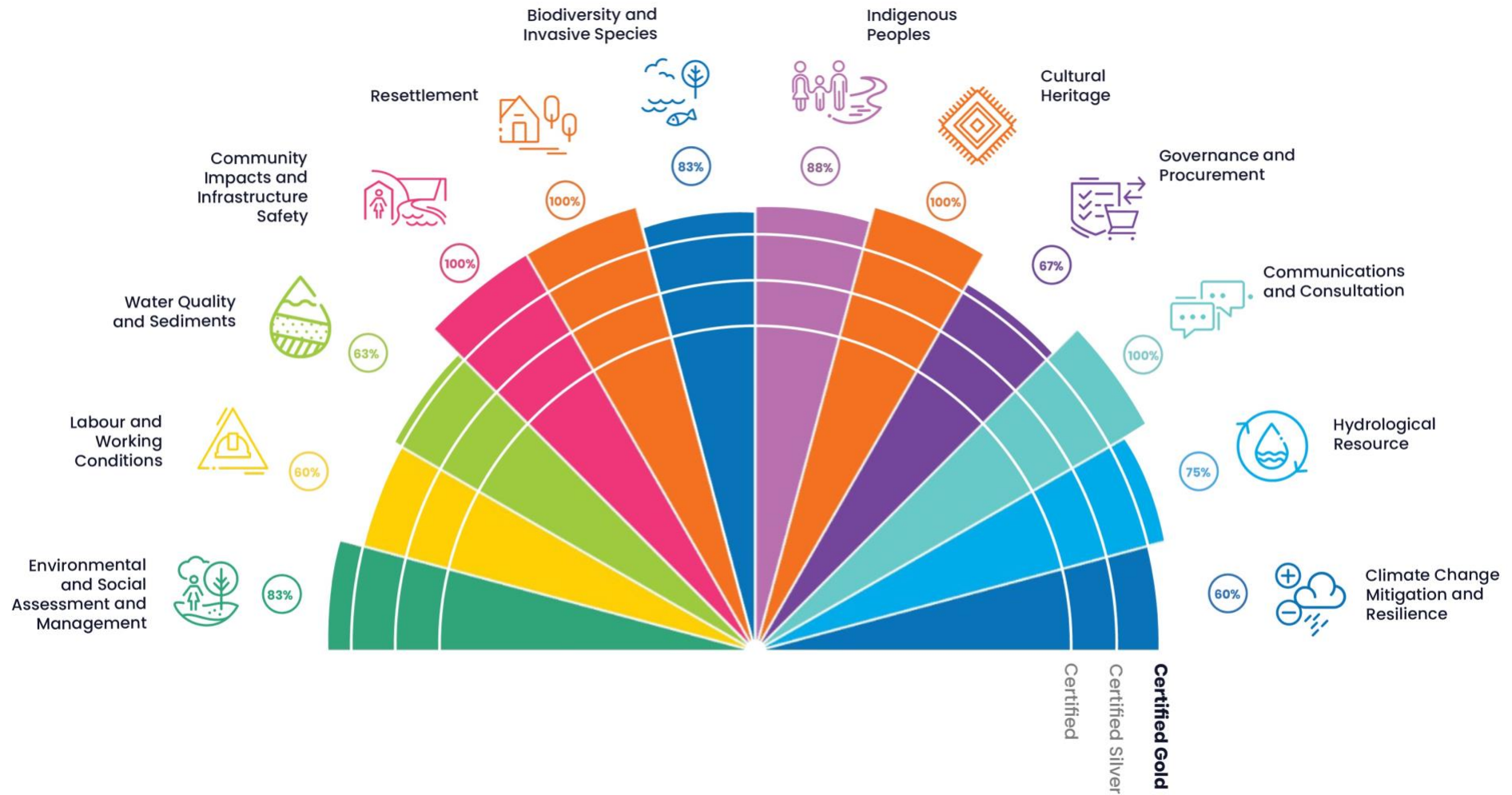


Figure 1 – Google Earth image and topographical map of the project layout

B. Project Details

C. Results Diagram



Operation

D. Minimum Requirements

No significant gaps against the minimum requirements were identified.

E. Advanced Requirements

	Sections											
	1. Environmental and Social Assessment and Management	2. Labour and Working Conditions	3. Water Quality and Sediments	4. Community Impacts and Infrastructure Safety	5. Resettlement	6. Biodiversity and Invasive Species	7. Indigenous Peoples	8. Cultural Heritage	9. Governance and Procurement	10. Communications and Consultation	11. Hydrological Resource	12. Climate Change Mitigation and Resilience
TOTAL NUMBER OF REQUIREMENTS	6	5	11	21	5	6	8	5	6	16	16	15
NUMBER OF REQUIREMENTS MET	5	3	7	21	5	5	7	5	4	16	12	9
PERCENTAGE OF REQUIREMENTS MET	83	60	63	100	100	83	88	100	67	100	75	60
PROPOSED CERTIFICATION LEVEL	Gold											

Note:

- A project must meet all Minimum Requirements on all relevant sections to achieve HS Certified label.
- To receive the HS Silver label, projects must meet at least 30% of the Advanced Requirements on each relevant section.
- To receive the HS Gold label, projects must meet at least 60% of the Advanced Requirements on each relevant section.

F. Environmental and Social Action Plan (ESAP)

Minimum Requirements							
Section	Significant gaps	Action(s)	Responsibility	Indicator of achievement	Timeframe		
					<12 months	12-24 months	>24 months
No significant gaps at the minimum-requirement level							

Advanced Requirements							
Section	Requirement sought	Action(s)	Responsibility	Indicator of achievement	Timeframe		
					<12 months	12-24 months	>24 months
1	An internationally recognised EMS.	Work has already started. Continue this and complete and maintain certification for ISO 14001.	Urja's E&S General Manager and ESHS Specialist	ISO 14001 certification.		X	
2	Processes for emerging risks and opportunities in place.	Add the aspect of external consultants, contractors and external suppliers to the OHS Policy.	Urja's Corporate HR Officer	An updated policy document approved by the Board.	X		
2	Labour-management policies <i>demonstrated</i> to be consistent with internationally recognised labour rights.	Would necessitate a special-purpose gap analysis by a labour-rights experts.	Urja's Corporate HR Officer	A special-purpose report demonstrating consistency.	X		
3	Identification of ongoing or emerging water quality issues takes into account both risks and opportunities.	The ongoing water-quality monitoring shall be used as a basis for risk identification (and opportunities, but this is reasonably well covered already) in relation to water quality	Urja's E&S General Manager and ESHS Specialist	A water-quality risk identification document with suggested mitigation and monitoring measures identified.	X		
3	Processes are in place to anticipate and respond to emerging risks and opportunities relating to water quality.	The mitigation and monitoring measures identified in the above action implemented regularly.	Urja's E&S General Manager and ESHS Specialist	The mitigation and monitoring measures identified in the above action reported regularly in the bi-annual reports.	X		
3	Water quality in the area affected by the operating hy-	This is not fully under the control of the project. Actions by the project	Urja's E&S General Manager	Same as above with the added participation of other		X	X

	dropower facility is of a high quality.	identified above will contribute towards resolving the issue but cannot do so comprehensively without actions by other stakeholders in the upstream catchment of the Mai Khola. Actions that could potentially contribute to a resolution involve significant interactions with both Government and nongovernmental stakeholders in the catchment area.	and ESHS Specialist	stakeholders relevant to water quality of the Mai Khola at the project site.			
3	Erosion and sedimentation ... do not present ongoing problems for environmental, social and economic objectives	Continue the erosion-control activities around the surge shaft and also the community assistance with addressing collapsed irrigation infrastructure following floods.	Urja's E&S General Manager and ESHS Specialist	No landslides occurring in the surge-shaft area (continuously monitored and reported) and any flood-damaged irrigation infrastructure repaired as a community-assistance benefit (reported in the bi-annual reports).		X	X
6	There are healthy, functional and viable aquatic and terrestrial ecosystems in the area.	This gap is largely outside of the control of the project and cannot be closed by the project alone.	N/A	N/A	N/A		
7	Maximise the opportunities for positive impacts for IPs.	More frequent follow-up with the IP families in the project-affected area and implementation of the livelihood-improvement plan under preparation.	ESG and CLO teams	More informal visits to and/or discussions with project-affected IPs reported in regular project reports. The livelihood-improvement plan implemented with suitable indicators included in regular project reports.	X		
9	Contractors are required to meet or have consistent policies as the developer	This gap is largely outside of the control of the project and cannot be closed by the project alone but would necessitate legislative/regulatory changes.	N/A	N/A	N/A		
9	Procurement processes include anti-corruption	This gap is largely outside of the control of the project and cannot be	N/A	N/A	N/A		

	measures as well as sustainability and anti-corruption criteria specified in pre-qualification screening	closed by the project alone but would necessitate legislative/regulatory changes.					
11	Water availability and/or reliability identified and evaluated, affecting 2 advanced-level requirements.	Complement the Hydrological Resource Study with a comprehensive analysis of the water availability now and in the future through e.g. a more detailed analysis of water demand in the upstream catchment.	Urja's hydrologist	A section on water demands in the upstream section included in an updated Hydrological Resource Study.	X		
11	Operation has flexibility to anticipate and adapt to future changes.	Please see actions on climate resilience and risk under Topic 12 below.	Please see Topic 12 below.	Please see Topic 12 below.	X		
11	Downstream flow is an optimal fit.	This would necessitate changes beyond the financial sustainability of the plant – not recommended.	N/A	N/A	N/A		
12	Assessment of resilience, affecting 6 advanced-level requirements.	Commission an expert to analyse how available national-level climate-change resilience and risk reports apply to Mai Beni (and other Urja assets). This is the same action as that identified in order to close the Topic-12 gap against minimum requirements.	Urja's E&S General Manager to hire external consulting expertise.	A report detailing how national-level resilience and risk assessments apply to Urja's projects.	X		



1 Environmental and Social Assessment and Management

Scope and Principle	
This section addresses the plans and processes for environmental and social issues management. The principle is that negative environmental and social impacts associated with the hydropower facility are managed; avoidance, minimisation, mitigation, compensation and enhancement measures are implemented; and environmental and social commitments are fulfilled.	

Background	
Identify the main environmental and social issues during operation	Occupational health and safety (OHS); waste management; wastewater management; impacts on fish and other aquatic biodiversity
Identify the environmental regulator	Ministry of Forests and Environment (MoFE), and its Department of Environment and Department of Forests; Ministry of Energy, Water Resources and Irrigation (MoEWRI) and its Department of Electricity Development (DoED).
Identify other regulators (e.g., on land, water use, Indigenous Peoples)	Some other ministries and their relevant departments that are provided in the subsequent Topic sections, 2-12.
Summarise the ESIA regulatory requirements	Environment Protection Rules, 2054 with its subsequent amendments 2064 (these dates are 1997 and 2007 respectively, in western date format). The statutory requirement for HPPs between 1 and 50 MW of installed capacity is an Initial Environmental Examination (IEE).
Describe the non-physical cultural heritage in the project area	The project-area communities follow two different religions – Buddhism and Hinduism - largely divided such that IPs follow the Buddhist faith and the non-IP population (Brahmins and Chettris) follow Hinduism. Many practices are shared across religions and the most important practice of relevance to the project is cremation and the cultural demands associated with this practice.
Other relevant information	The Government’s capacity for monitoring and supervision is generally weak (funding issues), and self-monitoring is (as per May of 2023) is now a regulatory requirement in Nepal. Penalties apply in case of regulatory breach by the company: First stage is a warning with fine, if it concerns a technical issue the fine is 0.5 million NPR; if it concerns an environmental issue the fine is 2.5 million. The regulator uses 1-2 warnings. If the penalty is not paid and/or the situation is not rectified, the regulator can withdraw the license. In such a case the government would step in and take over. In such a case responsibility would shift to NEA. It is important to note that this has never happened.

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
Assessment					
Systematic processes are in place to identify any ongoing or emerging environmental and social issues associated with the operating hydropower facility	✓	Systematic monitoring is ongoing both at the power plant and, in terms of official reporting, at Urja's HQ. No issues of concern are identified by the E&S team, but the discrepancy between their opinion and the issues identification in the Updated Initial Environmental Examination (UIEE) is assessed as a non-significant gap, as it is clear to the assessors that the disagreements reflect "standard issues" which often get repeated in IEEs for hydropower projects, without specific attention to project-specific conditions.	Processes to identify ongoing and emerging environmental and social issues take into account broad considerations, and both risks and opportunities	✓	Dedicated socio-environmental expert staff are stationed permanently at the project site (not a common feature of a 9.5 MW project). This allows the general Urja E&S team at HQ as well as the project team at site to capture emerging issues, risks as well as opportunities at an early stage and identify the best way to deal with those. The lack of planned regular (bi-annual in response to regulatory requirement) monitoring of aquatic species is assessed as a non-significant gap. It is not realistic to require a 9.51 MW run-of-river HPP in the middle of a multi-project cascade development to implement detailed monitoring of the kind prescribed in the UIEE's management plan.
The processes utilise appropriate expertise	✓	The HQ staff consists of 4 people – 1 General Manager (E&S) who has a Doctorate degree; 1 Social and Land Management Officer (Masters level); 1 Environmental Officer (Master); and 1 Governance and support (Bachelor) The plant staff consists of an ESHS Officer and a Community liaison Officer			
Monitoring programmes are in place for identified issues	✓	The UIEE defined a number of issues to be monitored. There is, however, no regular monitoring of terrestrial or aquatic biodiversity as the need is not acknowledged. Some biodiversity investigations have been carried out as part of other specialist studies commissioned with the assistance of			

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
		the IFC, making this a non-significant gap. E&S monitoring is carried out bi-monthly at site and sent to HQ who are responsible to report to the Ministry on a bi-annual frequency. Monitoring of the Livelihood Restoration Programme follows the same approach.			
Management					
Environmental and social management system is in place to manage measures to address identified environmental and social issues	✓	There is an ESMS in place with a dedicated policy and allocated responsibilities, see above under Assessment. Urja in general, and Samling for Mai Beni specifically, have a strong focus on contributing to sustainable development and Urja has started a subsidiary with the sole focus of managing its Environmental, Social and Governance (ESG) undertakings – Urja E.S.G. Pvt. Ltd. The company’s policy targets UN SDGs 7, 9 and 13.	Processes are in place to anticipate and respond to emerging risks and opportunities	✓	Yes, the monitoring and primarily the presence of dedicated socio-environmental staff at site guarantees an early identification of any emerging risks and opportunities.
This management system is implemented utilising appropriate expertise (internal and external)	✓	Yes, see above under Assessment.	Plans and processes are embedded within an internationally recognised environmental management system which is third party verified, such as ISO 14001	✗	No, the system is not yet certified in accordance with any internationally recognised ESMS standard. This is a significant gap against the requirement. There are, however, plans to do this for all Urja’s projects in the future, through Urja E.S.G. Pvt. Ltd.

Conformance and Compliance

Processes and objectives in environmental and social management plans have been and are on track to be met with:					
• no major non-compliances	✓	<p>The UIEE prescribed the need for annual release of fish fingerlings in Mai Khola. This measure appears to be a standard measure recommended in all IEEs for hydropower without specific analysis. The measure is presently impossible to implement as fingerlings cannot be sourced in Nepal.</p> <p>This is a non-significant gap as it is not a relevant mitigation measure in the project context and, furthermore, impractical in the Mai Beni HPP context.</p>	There are no non-compliances	✓	<p>The aquatic-ecology mitigation and monitoring issues remain un-addressed. This is a gap at the level of advanced requirements but is considered non-significant as the measure is impracticable in the Nepalese context and should, therefore, not have been a part of management plans produced in the UIEE. This gap will remain as long as the project cannot reach an agreement with authorities regarding the measure's impracticality (and subsequent removal from the list of required mitigation and monitoring). This gap is also identified under Topic 6 but will not be double-counted.</p>
• no major non-conformances	✓	<p>The key commitments are: assistance to the project-affected wards for various development activities; full replacement of all damaged infrastructure and agricultural land; 1 person from each physically or economically displaced family given employment with Samling Power Company; and assistance with 500 metres of farm road in the project-affected area.</p> <p>All these commitments are met and/or continuously on track to be met as new requests are made, whenever reasonable.</p>			
Environmental and social commitments have been or are on track to be met	✓	See above.	There are no non-conformances	✓	The are no non-conformances

Environmental and social funding commitments have been or are on track to be met	✓	All funding commitments are met at the time of the assessment.			
Outcomes					
Negative environmental and social impacts associated with hydropower facility operations are avoided, minimised and mitigated	✓	All negative impacts are either avoided, minimised, mitigated or compensated as per the standard mitigation hierarchy.	Negative environmental and social impacts associated with hydropower facility operations are fully avoided, minimised, mitigated and compensated	✓	All negative impacts are either avoided, minimised, mitigated or compensated as per the standard mitigation hierarchy.
Land disturbance associated with development of the hydropower project is rehabilitated or mitigated	✓	Mitigation has been implemented, e.g., through covering dug-down pipelines with saved topsoil and the subsequent rehabilitation of the agricultural potential of the land as well or mitigated through e.g., bioengineering efforts at the surge shaft and penstock area.			
The operating hydropower facility or the corporate entity to which it belongs can pay for social and environmental commitments	✓	Budget sufficient to cover all sustainability-related costs and activities are made available to the E&S team as part of the standard operational budgets of HQ and the Mai Beni HPP respectively.			

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements.	5 out of the 6 advanced requirements are met.

Summary of findings and other notable issues
<p>The management of socio-environmental issues in Urja generally, and Samling more specifically, is of good to excellent quality and the HQ E&S team are in the process of formalising and preparing Urja’s ESMS for certification according to ISO 14 001.</p> <p>The only issue identified concerns recommended mitigation and monitoring from the UIEE (which, upon the document’s approval, becomes a regulatory requirement) in relation to aquatic ecology. These recommendations are generic and not based on project-specific assessment of needs and ability to be implemented. As such they have been concluded by the Assessment Team to be non-significant gaps This issue is the only management concern which warrants</p>

immediate and strong action on the part of the project owners – it is important to get the mitigation and monitoring plans amended to properly reflect only relevant and implementable activities.

The Mai Beni staff work closely with the project-affected communities and the local and regional authorities to address both project-induced issues as well as development priorities defined by stakeholders. The project regularly supports such additional requests/priorities to the full satisfaction of the project-affected communities.

A number of district-level administrators express a great number of, some quite serious, concerns, but are unable to give project-specific examples of non-compliances or non-conformances, appearing to address hydropower as an industry, rather than the Mai Beni HPP specifically. All such concerns have proven to be unwarranted in the case of Mai Beni, as proven through visual evidence observed by the Assessment Team.

Relevant evidence	
Interview	1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 22, 23, 24
Document	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 48, 49, 50, 51
Photo	1, 2, 3, 4, 6, 7, 8, 9, 12, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60



2 Labour and Working Conditions

Scope and Principle
This section addresses labour and working conditions, including employee and contractor opportunity, equity, diversity, health and safety. The principle is that workers are treated fairly and protected.

Background	
Labour requirements during operation (full-time equivalent)	30
Applicable key human resources regulations	The Labour Act 2017 (2074)
Applicable key occupational health and safety (OH&S) regulations	National Occupational Safety and Health Policy 2076 B.S (2019 in western date system)
Identify the regulator for labour law and OH&S	Ministry of Labour, Employment and Social Security (MoLESS); Department of Labour and Occupational Safety;
Other relevant information	N/A

Minimum Requirements		Advanced Requirements	
Requirement is met: yes (✓) or no (✗)	Findings and Observations	Requirement is met: yes (✓) or no (✗)	Findings and Observations
Assessment			
A periodically updated assessment has been undertaken of human resource and labour management requirements for the operating facility	✓ Labour- and human-resources management requirements are well defined by the Human Resource Policy. The Mai Beni HPP has only been in operation for 20 months at the time of this assessment, so no major updates have been necessary. The need for additional (or less) employees is, however, continuously reassessed by plant management at site.	Identification of ongoing or emerging labour management issues takes broad considerations into account, and both risks and opportunities	✓ Several aspects of hiring policies demonstrate attention to both risks and opportunities. The risk inherent in less than satisfactory contacts with project-area communities and authorities has been addressed by a dedicated Community Liaison team and an a highly significant identified opportunity (also mentioned under Topics 4 and 7) is to offer employment to one family member of each physically- or economically-displaced household, 24 in all.
The assessment included project occupational health and safety issues, risks, and management measures	✓ Yes, this is evidenced by the Occupational Health and Safety (OHS) Policy, together with the tool kit templates triggered by this policy.		

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
Monitoring is being undertaken to assess if management measures are effective	✓	Weekly monitoring is conducted using an HSE checklist.			
Ongoing or emerging labour management issues have been identified	✓	No issues have so far been identified but monitoring by both plant-based and HQ-based staff is in place.			
Management					
Human resource and labour management policies, plans and processes are in place to address all labour management planning components	✓	Yes, the Human Resource Policy together with the tool kit templates triggered by this policy address all labour-management planning aspects			Urja/Samling have worked together with the IFC to improve gender-relevant aspects of human resources. Urja is a participant in IFC's "Power by Women" programme and has also developed a comprehensive "Gender Based Violence and Harassment Policy and Protocol" aiming at reducing/abolishing GBVH in the company.
Human resource and labour management policies, plans and processes of contractors, subcontractors and intermediaries are in place	✓	The Human Resource Policy includes a category named "Consultant/External Supplier" in its policy statements, to be addressed as part of contracts. The lack of a more spelled-out wording is considered a non-significant gap at this minimum-requirement level.	Processes are in place to anticipate and respond to emerging risks and opportunities	✗	However, the limited attention to the category of "Consultant/External Supplier" in the Human Resource Policy, and the complete lack of mention of contractors/external suppliers etc., in the Occupational Health and Safety (OHS) Policy constitutes a significant gap at this advanced-requirement level. Work to close this gap is already under way in Urja/Samling but will have to be the subject of re-assessment (if necessary and desirable) when in place.
Conformance and Compliance					
Processes and objectives relating to human resource and labour management have been and are on track to be met with:			There are no non-compliances	✓	There are no non-compliances

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
• no major non-compliances	✓	There are no major non-compliances.			
• no major non-conformances	✓	There are no major non-conformances.	There are no non-conformances	✓	There are no non-conformances.
Any labour related commitments have been or are on track to be met	✓	All identified labour-related commitments are met at the time of the assessment.			
Outcomes					
There are no identified inconsistencies of labour management policies, plans and practices with internationally recognised labour rights	✓	Nepal has only ratified 7 of the 10 fundamental ILO Conventions. The ones not ratified are C087, C155 and C187, dealing with either freedom of association or with occupational safety and health. Furthermore, Protocol P029 on the Forced Labour Convention (which Nepal has ratified) has not been ratified. The Human Resources Policy and Occupational Health and Safety (OHS) Policy are well-developed documents with fair to good alignment with most internationally-recognised labour rights and Nepal's Labour Act 2017 (2074) incorporates clear rules for freedom of association consistent with international standards. The absence of any mention of freedom of association in the Human Resources Policy and, in addition, specifically point 9.1.4, which gives Samling's Board the right to change working hours without any expressed opportunity for an employee to renegotiate benefits in response to	Labour management policies, plans and practices are demonstrated to be consistent with internationally recognised labour rights	✗	Samling has a high-quality HR policy, upgraded in 2023, but there is no assessment or other evidence available which clearly demonstrates this requirement to be met.

Minimum Requirements		Advanced Requirements	
Requirement is met: yes (✓) or no (✗)	Findings and Observations	Requirement is met: yes (✓) or no (✗)	Findings and Observations
	such a change, constitute a non-significant inconsistency (gap) with internationally-recognised rights as this issue is covered by the Act.		

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements.	3 out of the 5 advanced requirements are met.

Summary of findings and other notable issues
Nepal has ratified only 7 of the 10 “Fundamental Conventions” of the ILO, but the Labour Act 2017 (2074) comprehensively addresses the regulatory shortfall in terms of freedom of association which could potentially have been caused by Nepal not having ratified C087 (but it has ratified the closely related C098). The lack of ratified conventions concerning Occupational Health and Safety is addressed by the Occupational Health and Safety (OHS) Policy, together with the tool kit templates triggered by this policy

Relevant evidence	
Interview	1, 2, 12, 13, 14, 15, 16, 17, 23
Document	1, 2, 4, 5, 6, 8, 10, 21, 22, 23, 24, 25, 26, 27, 40, 41, 42, 43, 55
Photo	2, 6, 9, 10, 11, 12, 13, 30, 44, 59

3 Water Quality and Sediments



Scope and Principle	
<p>This section addresses the management of water quality, erosion and sedimentation issues associated with the operating hydropower facility. The principle is that water quality in the vicinity of the operating hydropower facility is not adversely impacted by activities of the operator, that erosion and sedimentation caused by the project are managed responsibly and do not present problems with respect to other social, environmental and economic objectives, and that commitments to address water quality, erosion and sedimentation issues are fulfilled.</p>	

Background	
Water Quality	
Description of water quality	Laboratory analysis of the water quality was conducted as part of the IEE and parameters such as turbidity, iron, total coliform and E. coli were found to be above the limits prescribed by the National Drinking Water Quality Standards, 2062/2005 (NDWQS), thus unfit for drinking.
Key water quality issues	The catchment of the Mai Khola has dense human settlement with a lot of human and livestock activities that contribute to the pollution of the water source. The construction activities were identified as the main contributing factor of the project for this issue
Main influences on water quality	The monsoon (the water has high turbidity during monsoon due to high suspended load), human and livestock activities. The river is deemed to be free from pollution of urban origin such as sewage and industrial discharge. The local farmers are using chemical fertilizers and pesticides along with animal manure.
Sedimentology	
Key sediment issues	<p>The key sediment issue of the facility is regular flushing of the desander, land slides and risks of erosion in connection to project infrastructure.</p> <p>Upstream issues include increased erosion/sedimentation due to land-use change and landslides.</p>
Sediment load (tonnes/year)	1.66 million tonnes/year from the Mai Khola basin at Mai Beni. This is equivalent to 86 tonnes/ha. The suspended sediment concentration during rainy season is as high as 3.56 g/l
Catchment area at the dam	194 km ² at the weir
Other information	The average gradient of the river from the intake to the powerhouse is about 3.5%

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
Assessment					
Ongoing or emerging issues have been identified in the following areas:			Identification of ongoing or emerging water quality issues takes into account both risks and opportunities	✗	Risks of deterioration of water quality due to generated waste is strictly monitored and generated waste is appropriately disposed of. The project has identified the need for assistance with clean drinking water at the cremation site located at the project's intake. However, there has been no comprehensive analysis of risks and opportunities related to water-quality issues. This is a significant gap against the requirements
• water quality	✓	The project has a water-quality baseline from the UIEE. Ongoing monitoring has not revealed any emerging issues in regard to water quality.			
• erosion and sedimentation	✓	The issues with the flushing of the desander were identified already during the UIEE. Emerging risks of erosion have been identified in connection to the project infrastructure.			
If management measures are required, then monitoring is being undertaken to assess if management measures are effective for:			Identification of ongoing or emerging erosion and sedimentation issues takes into account both risks and opportunities	✓	The project shows proactiveness in addressing risks of erosion and sedimentation around project infrastructure exemplified by e.g., the implementation of bio-engineering and additional strengthening of the riverbank at the headworks. The latter measure addresses an issue beyond what is considered directly affected by the project, as the erosion and landslide at the headworks were caused by high flows coming in from the upstream hydropower project and catchment.
• water quality	✓	Water quality has been tested once (still in the lab at the time of compiling the report) in accordance with the management plan that stipulates that the water quality should be tested once during the first two years of operation. There are measures in place in the management plan to avoid any further deterioration of the water quality (such as collection, recycling and reduction of waste and septic tanks in the camp sites). This is monitored bi-annually in the monitoring report.			
• erosion and sedimentation	✓	The turbidity of the water was tested as part of the water-quality test described above (this is the only requirement in the UIEE management			

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
		plan when it comes to erosion and sedimentation). There are procedures in place to address and monitor the identified emerging erosion and sedimentation risks, these were to be assessed three times a year during construction, the monitoring report shows that there are ongoing processes to address these identified issues.			
Management					
Measures are in place to manage the following identified issues:			Processes are in place to anticipate and respond to emerging risks and opportunities relating to:		
• water quality	✓	See under assessment above	• water quality	✗	See under assessment above
• erosion and sedimentation	✓	See under assessment above	• erosion and sedimentation	✓	See under assessment above
Conformance and Compliance					
Processes and objectives in place to manage each of the following have been and are on track to be met:			There are no non-compliances relating to:		
• water quality, with no major non-compliances	✓	Two monitoring reports should have been submitted last year but only one was finalised. This is a gap against the requirement, but it is a non-significant gap since the objective is now met.	• water quality	✓	The monitoring report that has been submitted is of good quality, but there should have been two reports submitted last year to fully meet the project's compliance with national regulation. As the project is now compliant with its monitoring responsibilities, the earlier non-compliance is considered a non-significant gap at the time of the assessment.
• water quality, with no major non-conformances	✓	There are no non-conformances as there are no own commitments against which to assess.			
• erosion and sedimentation, with no major non-compliances	✓	Same as under water quality above	• erosion and sedimentation	✓	Same as above

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
• erosion and sedimentation, with no major non-conformances	✓	The project has made several commitments on this Topic and the objectives of these are on track to be met.			
Commitments related to the following have been or are on track to be met:			There are no non-conformances relating to:		
• water quality	✓	See above	• water quality	✓	There are no additional commitments made beyond compliances with regards to water quality issues.
• erosion and sedimentation	✓	See above	• erosion and sedimentation	✓	There are no non-conformances as all commitments for erosion and sedimentation are on track.
Outcomes					
Negative water quality impacts arising from activities of the operating hydropower facility are avoided, minimised and mitigated	✓	The water quality pre-project was found to be unfit for drinking, but the operation of the facility has limited any further deterioration of the water quality. Measures are in place to avoid, minimise and mitigate those additional impacts that the project might have (see examples under assessment above).	Water quality in the area affected by the operating hydropower facility is of a high quality	✗	The project does not have any programme in place to improve the quality in the long-term perspective, meaning that the poor quality generally persists. This is a significant gap against the requirements.
			The facility has contributed or is on track to contribute to addressing water quality issues beyond those impacts caused by the operating hydropower facility	✓	The project has contributed to improved drinking water and toilet facilities at the cremation sites.
Erosion and sedimentation issues are avoided, minimised and mitigated	✓	The project has proactively been addressing any erosion or sedimentation issue that has occurred around the project sites.	Erosion and sedimentation associated with operating facility do not present ongoing problems for environmental, social and economic objectives of the facility or the project-affected areas	✗	The proactiveness of the project has addressed a majority of the ongoing problems connected to erosion and sedimentation and also contributed to resolving erosion-related problems beyond the Mai Beni project's impacts. However, there are several risk areas present, for example, the surge shaft that are still being

Minimum Requirements		Advanced Requirements	
Requirement is met: yes (✓) or no (✗)	Findings and Observations	Requirement is met: yes (✓) or no (✗)	Findings and Observations
			addressed. Hence these areas still present ongoing problems for environmental, social and economic objectives. This is a significant gap against the requirements that will likely be removed in the medium-term future.

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements	7 out of the 11 advanced requirements are met.

Summary of findings and other notable issues
The project has good processes in place for the monitoring of water-quality and erosion/sediment issues. The project is proactively addressing erosion or sedimentation issues that occur contributes to some water-quality issues beyond those impacts caused by the facility. However, no comprehensive assessment of emerging water-quality risks and opportunities has been conducted, and there are still erosion and sedimentation issues that present ongoing problems for environmental, social and/or economic objectives.

Relevant evidence	
Interview	1, 5, 6, 13, 14
Document	6, 10
Photo	1, 2, 12, 14, 15, 16, 17, 18, 37, 42, 48, 50, 60

4 Community Impacts and Infrastructure Safety



Scope and Principle

This section addresses how impacts of development of the hydropower facility on project-affected communities have been addressed, in cases where these commitments are well-documented against a pre-project baseline. These impacts include economic displacement, impacts on livelihoods and living standards, public health impacts, impacts to rights, risks and opportunities of those affected by the project, infrastructure safety risks and additional benefits that can arise from a hydropower facility. The principle is that livelihoods and living standards impacted by the project have been improved relative to pre-project conditions for project-affected communities, that commitments to project-affected communities have been fulfilled, and that life, property and community assets and resources are protected from the consequences of dam failure and other infrastructure safety risks. This section does not address requirements that relate to physical displacement or to Indigenous Peoples, which are addressed in Section 5 and 7. Other interested parties and groups are addressed in Section 10.

Background

In the case of older projects, are there well-documented commitments in relation to project-affected communities and/or projects benefits made at the time of project approval and/or data on the pre-project baseline against which to compare post-project?

Yes, all scoring statements are relevant	All scoring statements are relevant
No, scoring statements on project-affected communities and/or project benefits are not relevant (in this case, issues in relation to these Topics should be taken into consideration under Section 1 – Environmental and Social Issues Management)	N/A

Community Impacts and Benefits

Description of project-affected communities and how they are affected (distinguish between directly affected vs economically displaced vs other affected communities and include number of people and households)	The directly-affected households number 24 out of which 23 are economically displaced (some losing 100% of their land) and 1 is physically displaced and covered under Topic 5. All these households had land titles. The remaining community in the project-affected area are indirectly-affected through project-associated vehicle traffic, reduced river flow in the dewatered section of Mai Khola and through benefits accruing to the District and Wards through the hydropower taxation system.
Agencies relevant to land acquisition	Ministry of Land Management, Cooperatives and Poverty Alleviation (MoLCPA); District Administration Office (DAO); Ministry of Forests and Environment (MoFE);
Agencies relevant to livelihood restoration and project benefits	Ministry of Agriculture and Livestock Development (MoAID)

Infrastructure Safety and Public Health

Type of dam	Weir
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Dam height (m)	N/A
Probable maximum flood (m ³ /s)	Not calculated as there is no practical need with an overflow weir. For the design flood, see below.
Design flood (expressed as estimated flood with return period)	972 m ³ /s, 100-year return period
Spillway capacity (m ³ /s)	N/A (overflow weir)
Spillway height (m.a.s.l.)	N/A (overflow weir)
Headrace length (m)	4 331 m, divided between 447 + 1 319 metres of headrace pipes, and 1 079 + 1 486 metres of headrace tunnels.
Headrace diameter (m)	2.1 metres for the headrace pipes; 2.8 metres for the headrace tunnels
Headrace capacity (m ³ / s)	8.4 m ³ /s
Seismicity	The effective design seismic coefficient is 0.10 to 0. 14.
Geology	Higher Himalaya zone composed of fine textured dark to greenish-white quartz-biotite schists, quartz-feldspar biotite schist with banded gneisses. Thin to medium-bedded and locally fractured rock, weak to medium strong and moderately to slightly weathered in nature.
Dam safety regulatory authorities	N/A
Local presence/capacity of emergency services	This is detailed in the Emergency Response Plan (ERP), some basic equipment available at the site and more advanced services in the district capital of Ilam.
Potential safety risks in this context	Floods, earthquakes, land slides
Degree of risk of dam failure and in what way	0, as there is no dam, just a gently-sloping overflow weir, surrounded by a greater river area which has historically passed all floods.
Population at risk of dam break (locations, numbers)	No dam, hence, the number is 0.
Dam safety standards followed	N/A
Agencies relevant to dam safety	N/A
Other infrastructure safety issues	N/A
Description of key public health issues	There are no public-health issues associated with the project. According to the UIEE, there are general health issues in the project area of skin diseases, diarrhoea, diabetes, abdominal pain, tooth ache, but no serious epidemic diseases.
Agencies relevant to public health	Ministry of Health and Population; District Hospital in Ilam; and Ward Health Posts.

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
Assessment					
Community Impacts and Benefits					
Monitoring is being undertaken to assess if the following commitments have been delivered and if management measures are effective:					
• commitments to project-affected communities	✓	Yes, through the Community Liaison Officer (CLO) and his assistants.	Identification of ongoing or emerging issues for project-affected communities takes into consideration both risks and opportunities, and interrelationships among issues	✓	The CLO team are perceptive to emerging opportunities as defined by community members and leaders as well as by themselves. Frequent consultative meetings with small groups of stakeholders guarantee that emerging issues are identified.
• commitments to project benefits	✓	Continuous monitoring by the CLO team and also by the Ward and District officials who monitor that benefits are being delivered. The Nepalese hydropower tax system is monitored, and funds redistributed in accordance with the law, by the relevant authorities			
Ongoing or emerging issues relating to the following have been identified:			Identification of ongoing or emerging issues relating to project benefits takes into account both risks and opportunities	✓	See above.
• issues that affect project-affected communities	✓	Yes, see above.			
• delivery of project benefits	✓	Yes, see above.			
Infrastructure Safety and Public Health					
Ongoing or emerging issues relating to the following have been identified:					
• dam and other infrastructure safety	✓	<p>“The dam” does not have any identified safety issues associated with it. It is a low gently-sloping overflow weir with no potential for a dam-break release of significant volumes of water.</p> <p>The safety of intake, headrace, surge shaft, penstock and the power-plant and transmission infrastructure is monitored closely through general</p>	Identification of ongoing or emerging safety issues takes into account a broad range of scenarios and both risks and opportunities	✓	Urja/Samling have made very significant contributions to the area’s public safety through its dedicated work with the USAID-funded Tayar initiative for improved risk Management in Nepal. This includes rainfall gauges and river-discharge gauges as part of an early-warning system for floods in the Mai Khola catchment, as well as significant contributions to Ilam district’s

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
		<p>observational and special weekly inspections. However, the plant suffered flood damage already one month after the start of commercial operations, but the project is reviewing its operations in order to avoid such incidents in the future, based on a comprehensive flood-flow assessment.</p> <p>Another focus area is the very steep area around the surge shaft where the risk of slides has been identified.</p>			<p>emergency-response system, including equipment. The flood damage caused by heavy rainfall on the 19th of October 2021, only one month after the project went into (sooner than expected) commercial operation precipitated a dedicated flood-flow assessment to be conducted.</p>
• public health issues associated with the operating hydropower facility	✓	There are no public-health issues associated with facility.			
Routine monitoring of dam and infrastructure safety is being undertaken to identify risks and assess the effectiveness of management measures	✓	Dam safety is not applicable as there is no dam. Other project infrastructure is carefully monitored by site technical staff, evidenced by monitoring reports and active work observed in the field.			
If public health issues require management measures, then monitoring is being undertaken to assess if management measures are effective	✓	N/A, no issues identified	Identification of ongoing or emerging public health issues takes into account public health system capacities, access to health services, and health needs, risks and opportunities for different community groups	✓	The project identified a public-health opportunity during the Covid-19 pandemic, handing out medical materials in custom-prepared bags to community members in the project-affected area.

Management					
Community Impacts and Benefits					
Measures are in place to deliver commitments:			Processes are in place to anticipate and respond to emerging risks and opportunities relating to project-affected communities and project benefits	✓	The CLO and his assistants are in constant contact with communities and authorities, monitoring emerging issues and responding to contacts initiated by stakeholders. Regular small-group consultative meetings are an important part of this, see also Topic 10
• to project-affected communities	✓	The plant management, supported by the CLO team, have well-defined processes for the delivery of commitments.			
• to project benefits	✓	The plant management, supported by the CLO team, have well-defined processes for the delivery of benefits.			
Measures are in place to manage any identified issues relating to these commitments:					
• to project-affected communities	✓	See above.			
• to project benefits	✓	See above.			
If there are any formal agreements with project-affected communities, these are publicly disclosed	✓	No formal agreements exist beyond the land purchase agreements / contracts, which are publicly available through the district authorities.			
Commitments to project benefits are publicly disclosed	✓	The only formal commitment to additional benefits is the system for hydropower taxes and shares, which is publicly disclosed.			
Infrastructure Safety and Public Health					
Dam and other infrastructure safety management plans and processes have been developed in conjunction with relevant regulatory and local authorities	✓	N/A, on the dam as there is no dam. District authorities are involved in, and informed of, all other planning as appropriate.	Processes are in place to anticipate and respond to emerging infrastructure safety risks and opportunities	✓	The project’s infrastructure is carefully monitored by site technical staff, evidenced by monitoring reports and active work observed in the field. Any identified issues would trigger management response.
These plans and processes provide for communication of public safety measures	✓	There is a siren- and sign-based communication system regarding sudden increases in water releases. Regular community meetings offer	Public safety measures are widely communicated in a timely and accessible manner	✓	Multiple training events held to spread information and knowledge regarding emergency systems and to create community awareness on

		additional opportunities for the project to communicate safety aspects of importance to the public.			issues such as floods and landslides. The Covid-19 support programme was communicated on a person-to-person basis throughout the project-affected area.
Emergency response plans and processes include awareness and training programmes and emergency response simulations	✓	Awareness and capacity-building training programme on landslide risk reduction and capacity-building training on community-based early-warning system for floods, including two disaster-simulation exercises, have been conducted through the Tayar programme.			
Measures are in place to manage identified public health issues	✓	N/A as no issues are identified.	Processes are in place to anticipate and respond to emerging public health risks and opportunities	✓	Emerging risks and opportunities would be captured through the project's management, by the CLO team and through the community meetings. The main emerging issue identified and responded to, thus far, was the Covid-19 pandemic, which resulted in the support programme being implemented.
Conformance and Compliance					
Community Impacts and Benefits					
Processes and objectives in place to manage the following have been and are on track to be met:			There are no non-compliances relating to:		
• delivery of commitments to project-affected communities, with no major non-compliances	✓	There are no major non-compliances.			There are no non-compliances. However, there are elected district-level officials who claim the existence of a number of shortcomings which could be considered non-compliances. Visual evidence proves these concerns to be either outdated and long-since addressed or simply not true. See also Topic 9 for issues related to elected officials.
• delivery of commitments to project-affected communities, with no major non-conformances	✓	All commitments are delivered with no major non-conformances.	• project-affected communities	✓	

• project benefits, with no major non-compliances	✓	There are no major non-compliances.	• project benefits	✓	The project benefits mainly relate to the hydropower taxes and share system of the Nepal Government. These are delivered through automatic deductions by NEA from the payments for delivered energy.
• project benefits, with no major non-conformances	✓	All benefits are delivered with no major non-conformances.			
Commitments have been or are on track to be met relating to:			There are no non-conformances relating to:		
• project-affected communities	✓	All commitments have been and are met at the time of the assessment.	• project-affected communities	✓	There are no non-conformances.
• project benefits	✓	All commitments have been and are met at the time of the assessment.	• project benefits	✓	There are no non-conformances.
Infrastructure Safety and Public Health					
Processes and objectives in place to manage the following have been and are on track to be met:			There are no non-compliances relating to:		
• dam and other infrastructure safety, with no major non-compliances	✓	The formal process consists of weekly safety checks, coupled with day-to-day supervision by staff at work.	• dam and other infrastructure safety	✓	There are no non-compliances in relation to infrastructure safety.
• dam and other infrastructure safety, with no major non-conformances	✓	All internal requirements are followed as registered in the weekly safety checks.			
• public health issues, with no major non-compliances	✓	N/A, none identified	• public health	✓	N/A, as no issues have been identified, there are no regulations with which to comply.
• public health issues, with no major non-conformances	✓	N/A, none identified			
Commitments have been or are on track to be met relating to:			There are no non-conformances relating to:		
• dam and other infrastructure safety	✓	There are no commitments.	• dam and other infrastructure safety	✓	There are no commitments with which to conform.
• public health	✓	N/A, no issues identified	• public health	✓	N/A, as no issues have been identified, there are no internal procedures or commitments with which to conform. Objectives can be identified in response to community requests or special situation, such as the Covid-19 pandemic. All such objectives have been and are in

					conformance at the time of the assessment.
Outcomes					
Community Impacts and Benefits					
Livelihoods and living standards impacted by the project have been or are on track to be improved	✓	The main affected households have received compensation and benefits which provide for improved livelihoods and living standards in the form of cash, new land, new house and in the form of 1 employment with the project for each directly-affected family	The measures put in place to improve livelihoods and living standards are on track to become self-sustaining in the long-term	✓	Many of the measures put in place are on track to become self-sustaining. However, for this to last over the long term, it is absolutely necessary that the directly-affected households who have been given jobs with the project continue to benefit from this opportunity.
Economic displacement has been fairly compensated, preferably through provision of comparable goods, property or services	✓	Yes, however, the universally preferred compensation method is cash compensation, reflecting a general trend in Nepalese society.			
Communities directly affected by the development of the hydropower facility and any other identified beneficiary of the facility have received or are on track to receive benefits	✓	Yes, benefits have been and are being delivered and/or generated for directly-affected communities and e.g., district and wards, through the hydropower tax.	Benefits are significant and sustained for communities affected by the project	✓	Benefits are significant, and through the share and tax system they are also sustained. A good example is the recurring requests for additional water releases in the dewatered stretch of the Mai Khola, affecting two cremation sites and a temple (see Topic 8) whenever a cremation or festival is planned.
Infrastructure Safety and Public Health					
Safety risks have been avoided, minimised and mitigated with no significant gaps	✓	All public safety risks, mainly dealing with rapidly increased flows in the dewatered stretch in case of emergency shutdown of the turbines, and landslides caused by project infrastructure or operations have been avoided, minimised or mitigated with no significant gaps.	Safety risks have been avoided, minimised and mitigated with no identified gaps	✓	A flood which occurred shortly after the plant went into commercial operation caused significant problems for the plant, including a lengthy shutdown, see Topic 11 for details. This incident did, however, not have any significant safety implications.

					It is impossible to determine, at the time of the assessment, whether the physical protection and bio-engineering implemented at the surge shaft will effectively avoid all risks of a major landslide in that area, but it is an appropriate avoidance measure.
			Safety issues have been addressed beyond those risks caused by the operating facility itself	✓	Yes. The Tayar programme is a very comprehensive initiative which contributes to improved flood-related safety across the entire Mai Khola catchment.
Negative public health impacts arising from activities of the operating hydropower facility are avoided, minimised and mitigated	✓	N/A, none identified.	Where opportunities have been identified, measures to address public health issues beyond those impacts caused by the operating hydropower facility have been or are on track to be achieved	✓	Opportunities identified, mainly the Covid-19 community-support programme, have been achieved.

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements	21 out of the 21 advanced requirements are met.

Summary of findings and other notable issues
<p>Community Impacts and Benefits have been and are managed with a significant degree of proactiveness by the project. All the 24 directly-affected households who lost land to the project have been fairly compensated and offered jobs with the project. The Community Liaison Officer and his team are in frequent contact with the project-affected communities and the ward authorities, a process that is facilitated by the small direct-impact area. The frequent requests for additional assistance from the project, related and unrelated to project impacts, are dealt with in a generally positive manner. Livelihoods of the economically displaced households have been improved and are on track to be sustained in the long term.</p> <p>No public-health issues have been identified in relation to the project, but a major support programme to deliver medical supplies to the communities in response to the Covid-19 pandemic was identified and implemented as an additional benefit.</p> <p>Infrastructure Safety is mainly related to waterways and slope stability, as there is no dam in the project – the intake structure uses a very low and gently-sloping overflow weir to create the water body from which the water is drawn. Significant infrastructure risks are mainly the risk of emergency shutdown of the turbines during the dry season, which would result in rapidly increasing flow in the dewatered stretch, and of landslides caused by the project’s infrastructure or operations. These risks are generally well minimised and mitigated with the greatest risk as identified by the assessment team is the landslide risk around the</p>

steep slopes at the surge shaft, where physical and bio-engineering has been implemented. However hydrological variability and flooding (see also Topic 11) is a very real operational risk in a monsoonal climate such as that of eastern Nepal. The plant suffered a long shut-down already one month after going into commercial operations, with costs for repairs and lost revenue in excess of one million USD, some of which may be recoverable through insurance claims. The project generally manages its interactions with the community in regard to impact and risk management, delivery of benefits as well as responsiveness to needs and requests in an excellent manner. The only identified issue is the communication with elected officials which change regularly with each election. Long-standing contacts and trust are interrupted when key administrative staff is changed, resulting in some irritation from officials considering themselves to be uninformed. This issue deserves focussed project attention but is dealt with in more detail under Topic 9.

Relevant evidence	
Interview	1, 2, 5, 6, 7, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24
Document	1, 2, 5, 6, 8, 10, 11, 12, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 38, 39, 40, 44, 49, 50
Photo	1, 2, 4, 5, 7, 8, 9, 10, 12, 13, 14, 15, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 37, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 56, 60

5 Resettlement



Scope and Principle	
<p>This section addresses how the physical displacement arising from development of the hydropower facility has been addressed, in cases where resettlement occurred, and commitments are well-documented against a pre-project baseline. The principle is that the dignity and human rights of those physically displaced have been respected; that these matters have been dealt with in a fair and equitable manner; that livelihoods and standards of living for resettles and host communities have been improved; and that commitments made to resettles and host communities have been fully fulfilled. This section does not address those that are only economically displaced, who are addressed in Section 4.</p>	

Background	
Did the project require or result in any physical displacement of people? Please state the evidence on which this determination is made.	
Yes, this section is relevant (for older projects, move on to the next question)	Yes, it is relevant.
No, this section is not relevant	N/A
In the case of older projects, are there well-documented commitments in relation to resettlement made at the time of project approval and/or data on the pre-project baseline against which to compare post-project?	
Yes, this section is relevant	N/A
No, this section is not relevant (in this case, issues in relation to resettlement should be taken into consideration under Section 1 – Environmental and Social Issues Management)	N/A

Description of physically displaced communities and how they are displaced (distinguish between permanently vs temporarily and include number of people and households)	One household permanently displaced, one resident man with a son (not resident on the property) and two non-resident brothers. No temporary displacement.
Name and number of settlements	One single household physically displaced. The displaced household consisted of three brothers but with only one of those resident on the property. Hence the two non-resident brothers were compensated with cash only, resulting in the one resettlee - Buddha Bahadur Tamang – receiving only “his” 1/3 of the land area in replacement land, as compared to the original property.
Agencies relevant to land acquisition	Survey Office, Ilam; Land Revenue Office, Ilam; and the District Administration Office (DAO), Ilam
Agencies relevant to livelihood restoration	Several district authorities and the Wards
Other relevant information	There is no formal requirement for a Resettlement Action Plan or similar document to be prepared in Nepal. The most relevant regulatory instrument is

the Land Acquisition, Resettlement and Rehabilitation Policy for Infrastructure Development (2071), which is equivalent to 2014 in western date format.

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
Assessment					
Monitoring is being undertaken to assess if commitments made to resettles and host communities have been delivered and if management measures are effective	✓	Yes, this is carried out through the designated role of the Community Liaison Officer (CLO). Aspects to monitor are outlined in the Social Management Plan and the Livelihood Restoration Plan	Identification of ongoing or emerging resettlement issues takes into account both risks and opportunities	✓	The only resettlee expresses close to full satisfaction with the manner in which the project has taken risks and opportunities into account, by offering close to everything that he has requested. The only issues identified by the resettle are the fact that he was not given multiple options to choose from and that his new property is far from town (but not farther than the property from which he was displaced). These minor issues are assessed as non-significant gaps.
Ongoing or emerging issues relating to resettlement have been identified	✓	The only resettlee identified two concerns – to be given a replacement house with adjacent land and to be offered employment with the project.			
Management					
Measures to address resettlement are documented in a Resettlement Action Plan	✓	There is no formal RAP produced for the project. This is due to the fact that there is no regulatory requirement for this in Nepal. The necessary measures are addressed as part of the Livelihood Restoration Plan and Social Management Plan. The lack of a formal RAP is assessed as a non-significant gap, given that key content is contained in other documentation.	Processes are in place to anticipate and respond to emerging risks and opportunities	✓	Any emerging risks and opportunities should be effectively captured by the GRM and the CLO function. There is some doubt as to how active the CLO has been in relation to the resettlee, but the CLO appears to be well-known and on good terms with the resettlee, which results in the low contact frequency being assessed as a non-significant gap. Furthermore, the resettlee is an employee of the project, and as such has daily access to plant management in case any issues were to develop.
Measures are in place to deliver commitments to resettles and host communities	✓	The commitments made to the only resettlee have been delivered in full. There is no host community, as the resettlement property was procured by the project with a willing seller – willing buyer solution and the			

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
		resettlee's move to the new property does not change livelihoods for the surrounding community in any respect.			
Measures are in place to manage any issues relating to resettlement, including provision of grievance mechanisms	✓	The resettlement process is finalised, and no issues remain. The general GRM in place for the project is accessible to the resettlee if any issues relevant to his resettlement were to develop.			
Formal agreements with resettlees and host communities are publicly disclosed	✓	The formal agreement consists of the land purchase by the project for the resettlee's original property and of the land purchase and deed for the resettlement property. These documents are available to the public at the Ilam district HQ			
Conformance and Compliance					
Processes and objectives in the Resettlement Action Plan have been and are on track to be met with:					
• no major non-compliances	✓	The project is compliant with all resettlement-related sections of its management plans, even if there is no dedicated RAP.	There are no non-compliances	✓	See findings at left under Minimum Requirements.
• no major non-conformances	✓	The project is conformant with all resettlement-related sections of its management plans, even if there is no dedicated RAP.	There are no non-conformances	✓	See findings at left under Minimum Requirements.
Any resettlement related commitments have been or are on track to be met	✓	All resettlement-related commitments have been met.			

Outcomes					
Resettlement has been and is being treated in a fair and equitable manner	✓	The resettlee has been compensated with a new and significantly higher-standard house than the one lost, had his house connected to the electricity grid, plus received some land for cultivation (less than he sold) and been offered and accepted employment with the project.	The measures put in place to improve livelihoods and living standards are on track to become self-sustaining in the long-term	✓	The resettlee has experienced a significant improvement in his livelihood. From an existence based on low-yielding agriculture and temporary jobs, he now has steady employment, has established a bank account and even started aggregating savings for the first time in his life. For this highly successful outcome to be self-sustaining, the employment with the project needs to be maintained, or it is likely that a significant gap against the requirements at this level would develop in the future.
Resettles and host communities have experienced or are on track to experience a timely improvement in livelihoods and living standards relative to the pre-project baseline	✓	There is no host community as per standard definition. The resettlee himself attests to an improvement in livelihood and living standards.			

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements.	5 out of the 5 advanced requirements are met.

Summary of findings and other notable issues
Only one household was physically displaced by the project and only one individual was resident at that property. The displaced person has been given compensation for lost land and given a new significantly higher-quality house with water and electricity facilities. The displaced person expresses his satisfaction with the compensation and outcomes of the process.

Relevant evidence	
Interview	1, 2, 5, 6, 14, 17, 18, 19, 20, 23
Document	1, 2, 5, 6, 10, 21, 22, 23, 30, 31, 32, 40
Photo	31, 32, 33, 34, 35, 44

6 Biodiversity and Invasive Species



Scope and Principle

This section addresses ecosystem values, habitat and specific issues such as threatened species and fish passage in the catchment, reservoir and downstream areas, as well as potential impacts arising from pest and invasive species associated with the operating hydropower facility. The principle is that there are healthy, functional and viable aquatic and terrestrial ecosystems in the area that are sustainable over the long-term; that biodiversity impacts arising from the operating hydropower facility are managed responsibly; that ongoing or emerging biodiversity issues are identified and addressed as required; and that commitments to implement biodiversity and invasive species measures are fulfilled.

Background

Short description of the ecological region in the project area	The project catchment area is made up of both lowland regions and mountainous territory, ranging in elevation from 495 m.a.s.l. (Tilkeni) in the powerhouse areas to 3 533 m.a.s.l. in the mountains. The project region experiences a hot and humid environment, with summertime highs of 38 °C and wintertime lows of 4 °C. Additionally, it receives a lot of precipitation every year. The project is located at the middle reach of the Mai Khola (the Mai River in English), at the border of Ilam municipality and Mai Jogmai Rural municipality of Ilam district, Province no. 1. The project area consists mostly of agricultural land with the productive soil. Terrestrial land-cover types include subtropical mixed forests, scrubland, grassland, rocky areas, generally diversified habitats supporting a broad variety of fauna. In its undisturbed state Mai Khola, was an ideal environment for fish adapted to fast-flowing mountain streams. The aquatic ecosystem was severely fragmented before the Mai Beni project was constructed, and Mai Beni contributes to an almost complete cascade development of small run-of-river plants along the entire main stem of the river.
Protected areas (national parks and reserves etc) and their distance from the project	The project area does not lie within the boundary of any category of protected area. The nearest protected area (a Ramsar Site), Mai Pokhari, is located around 10 km north of the project site., outside of Mai Beni’s catchment area.
Critical habitats in the project area, including important bird areas, hotspots of endemism etc.	The project is located in modified habitat, and there are no critical habitats or natural habitats in the area of management (as per definition of the International Finance Cooperation (IFC) PS 6). Only two bird species were recorded in the June 2022 survey (Asian Wolly Neck and Mountain Hawk Eagle both listed as near threatened), however, bird species are not recommended for consideration in the Biodiversity Management Plan (BMP) since none have any restricted range in the area of management.
# threatened species in the directly affected area: terrestrial	Four species of mammals are reported as vulnerable: clouded leopard; common leopard; Assam Macaque; and Fishing Cat; Two species are listed as near threatened: Eurasian Otter, and Large Indian Civet. However, mammal species are not recommended for consideration in the BMP since they have widespread distribution in the area of management and none of the species reported have restricted ranges, according to the BMP.
# threatened species: aquatic	Five species of special concern and conservation importance were selected for inclusion as indicators in the BMP. They are: <ul style="list-style-type: none"> • Golden Mahseer (<i>Tor putitora</i>) - Endangered • Common Snow Trout (<i>Schizothorax richardsonii</i>) - Vulnerable

	<ul style="list-style-type: none"> • Copper Mahseer (<i>Neolissochilus hexagonolepis</i>) – Near threatened • Dinnawah Snow Trout (<i>Schizothorax progastus</i>) – Least Concern • Rupecula Loach (<i>Schistura rupecula</i>) – Least Concern
Any other species of conservation importance	None
Migratory pathways	<p>There are migratory fish in the river that could be affected by the structures of the project. It is important to note that the river was already severely fragmented when the Mai Beni project was constructed, with run-of-river hydropower plants located both upstream and downstream of Mai Beni’s location.</p> <p>In terms of terrestrial species there are leopard cats and common leopard, reported in the area, whose migratory routes could be affected. However, mammal species are not recommended for consideration in the BMP.</p>
Invasive species: terrestrial	<p>The BMP quotes Shresta (2016) saying that at least 20 plant species that can be considered as invasive are reported from eastern Nepal. There was apparently no specific survey done as part of the BMP to identify if any, some or all of these are present in the Mai Beni project area. The 20 listed in the BMP are: <i>Ageratina Adenophora</i>, <i>Chromolaena odorata</i>, <i>Eichhornia crassipes</i>, <i>Ipomoea carnea ssp. fistulosa</i>, <i>Lantana camara</i>, <i>Mikania micrantha</i>, <i>Alternanthera philoxeroides</i>, <i>Parthenium hysterophorus</i>, <i>Amaranthus spinosus</i>, <i>Argemone mexicana</i>, <i>Senna tora</i>, <i>Hyptis suaveolens</i>, <i>Leersia hexandra</i>, <i>Pistia stratiotes</i>, <i>Bidens pilosa</i>, <i>Senna occidentalis</i>, <i>Mimosa pudica</i>, <i>Oxalis latifolia</i>, <i>Xanthium strumarium</i>, and <i>Ageratum haustonianum</i>.</p> <p>It is worth noting that water hyacinth (<i>Eichhornia crassipes</i>) is quite familiar to members of the assessment team, and it was not observed during the field visit to the area.</p>
Invasive species: aquatic	None identified
Key threats to biodiversity	<p>The aquatic life and species that depend on a free-flowing river are seriously threatened by the cumulative impacts of the many migration obstacles as well as the, seasonally, significantly dewatered stretches created by the many cascade hydropower projects in the Mai Beni.</p> <p>Solid waste was also identified as a key threat in the Updated Initial Environmental Examination (UIEE), but the Mai Beni project’s contribution to this is well managed by the project.</p>
Agencies involved in biodiversity conservation	Ministry of Forests and Environment (MoFE); Department of Environment; Department of Forests and Soil Conservation; District Forest Office
Other relevant information	n/a

Minimum Requirements		Advanced Requirements	
Requirement is met: yes (✓) or no (✗)	Findings and Observations	Requirement is met: yes (✓) or no (✗)	Findings and Observations
Assessment			
Ongoing or emerging biodiversity issues have been identified	✓	Ongoing and emerging biodiversity issues are identified in the UIEE and BMP reports.	Identification of ongoing or emerging biodiversity issues ✓ The project, with the aid of the IFC, commissioned a specialist BMP to be developed. The monitoring

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
If management measures are required, then monitoring is being undertaken to assess if management measures are effective	✓	The UIEE report also identified management measures to track and understand the status of terrestrial and aquatic life for two years. Forest aspects have been outsourced to the District Forestry Department. The Biodiversity Management Plan has recently been finalised and is about to start being implemented. It does not recommend monitoring of plant species or mammals, but only aquatic species. This is a considerable change as compared to the UIEE which had a clearly over-ambitious monitoring plan for such a small project. In regard to waste management and it being a potential threat to biodiversity, the project reports on this in its bi-annual monitoring reports.	takes into account both risks and opportunities		programme contained in the BMP is a well-developed and highly ambitious one, which will ascertain that both risks and opportunities can be identified effectively. It is important to note that the BMP is possibly even over-ambitious in terms of geographic and thematic scopes, expecting the latest small project in a hydropower cascade to monitor and address issues of a highly complex and inter-dependent (with other HPPs) issues. The adaptive management approach – implement for one full year and then evaluate is, therefore, of the utmost importance for the long-term scope of biodiversity management by the project.
Management					
Measures are in place to manage identified biodiversity issues	✓	The ESHS Team at site are responsible for the day-to-day operations. The only biodiversity issue identified is monitoring to be executed over a one-year trial period, after which this should be evaluated for efficiency. This monitoring is reported in the bi-annual monitoring reports.	Processes are in place to anticipate and respond to emerging risks and opportunities	✓	See above under assessment.
Conformance and Compliance					
Processes and objectives in place to manage biodiversity issues have been and are on track to be met with:			There are no non-compliances	✓	The project is presently in compliance, having submitted one monitoring report recently. However, the earlier report which should have been filed
• no major non-compliances	✓	The project has acquired land for afforestation and handed it over to			

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
		the concerned authority to comply with regulatory requirement. The project has prepared one-monitoring report for the first half of 2023 in accordance with the regulations issued by Department of Environment. The project has not complied with all monitoring requirements outlined in the UIEE but instead commissioned the BMP which contains a new set of regulatory requirements. This is gap but not a significant one since the BMP will be implemented (see also under assessment above).			was not, but given that this issue is now on track, this has turned from a significant to a non-significant gap.
• no major non-conformances	✓	There are no major non-conformances.	There are no non-conformances	✓	The assessors did not identify any non-conformances.
Biodiversity related commitments have been or are on track to be met	✓	The minimal commitments done by the project are met.			
Outcomes					
Negative biodiversity impacts arising from activities of the operating facility are avoided, minimised, mitigated, and compensated	✓	Everything that can be done to avoid, minimise or mitigate project-associated impacts has been implemented. Implementation of the BMP will act as an additional level of assurance that this requirement is met also going forward.	There are healthy, functional and viable aquatic and terrestrial ecosystems in the area affected by the hydropower facility that are sustained over the long-term	✗	The heavily fragmented Mai Khola cannot be described as a healthy aquatic ecosystem. The terrestrial environment is also a (heavily) modified habitat with much of the forests replaced by agricultural land. The project's direct impact area is quite limited and located in a heavily populated area. In combination, these considerations make it highly unlikely that any management measures adopted will ever result in healthy, functional and viable ecosystems in

Minimum Requirements		Advanced Requirements	
Requirement is met: yes (✓) or no (✗)	Findings and Observations	Requirement is met: yes (✓) or no (✗)	Findings and Observations
			the project-affected area. While largely outside of the control of the project, this constitutes a significant gap against the requirements.
		✓	The facility has contributed or is on track to contribute to addressing biodiversity issues beyond those impacts caused by the operating hydropower facility The measures outlined in the BMP puts the project on track to contribute well beyond its own impacts.

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements.	5 out of the 6 advanced requirements are met.

Summary of findings and other notable issues
<p>The small size of the Mai Beni project, and its location in the middle of a pre-existing series of small run-of-river hydropower plants, automatically makes the cumulative biodiversity impacts caused by the project, especially to the already heavily fragmented Mai Khola, to be very limited. The project, with support from the IFC, has commissioned a specialist Biodiversity Management Plan (BMP) which has resulted in specific monitoring and management actions to be trialled for one year, then evaluated and revisited for efficiency and potentially necessary amendments. By implementing the BMP, the project is on track to respond to all minimum-level requirements and most of the advanced-level ones.</p> <p>This is, however, a precarious situation for the project as it is paramount that the BMP is adhered to and that the re-evaluation to be done in a year's time is implemented with the same level of professional support as that which developed the BMP in the first place.</p>

Relevant evidence	
Interview	5, 6, 11, 13, 17, 18, 19, 23, 24
Document	6, 10, 11, 37, 48, 51
Photo	4, 6, 7, 14, 19, 34, 36, 37, 38, 48, 50, 51

7 Indigenous Peoples



Scope and Principle

This section addresses the rights at risk and opportunities of Indigenous Peoples with respect to the hydropower facility, recognising that as social groups with identities distinct from dominant groups in national societies, they are often the most marginalized and vulnerable segments of the population. The principle is that the operating facility respects the dignity, human rights, aspirations, culture, lands, knowledge, practices and natural resource-based livelihoods of Indigenous Peoples in an ongoing manner throughout the project life.

Background

Are any of the affected people Indigenous Peoples? Please state the evidence on which this determination is made.

Yes, this section is relevant

Yes, this section is relevant.

No, this section is not relevant

N/A

Brief description of the peoples and their culture, lands, and representation	The project area consists of a mix of different ethnicities but the differences in lifestyles between them and the non-indigenous population are very small.
Directly affected communities and how they are affected	12 IP families were directly affected in the sense that they lost land, and in one case was physically displaced, and several others had their livelihoods affected by changes in river flow along the dewatered stretch. Impacts vary from lost land to effects on irrigation infrastructure and water availability.
Other affected indigenous communities	Around half of the population in the project-affected area and surroundings belong to various indigenous groups.
# households physically displaced	1
# households economically displaced	11 additional IP households have had land bought by the project.

Agencies relevant to Indigenous Peoples	Nepal Federation for Indigenous Nationalities (NEFIN). Not an authority or agency per se, but an acknowledged organisation working on behalf of IP communities across Nepal
Other relevant information	The IP situation in Nepal is different to that in most countries in that a very significant minority (NEFIN argues that at least half the population consists of IPs, as defined by the Constitution) is of IP ethnicity. These IPs often, as is the case in the project area, live mixed with non-IP people and are generally integrated into general Nepal society.

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
Assessment					
Ongoing or emerging issues relating to the operating hydropower facility that may affect Indigenous Peoples' rights have been identified	✓	There are no ongoing or emerging issues relating to the operating hydropower facility which may affect indigenous people's rights.	Identification of issues that may affect Indigenous Peoples' rights is undertaken with the free, prior and informed participation of Indigenous Peoples	✓	The affected families express full satisfaction with their ability to participate in the process of land purchase, definition of support to be given and the provision of permanent employment with the project. A consent requirement similar to FPIP, or even Free, Prior and Informed Consent (FPIC), for IPs is effectively written into the Nepali Constitution, Article 51, Sub Article J (8).
If management measures are required, then monitoring is being undertaken to assess if management measures are effective	✓	No necessary management measures have been identified beyond the mitigation and compensation negotiated as part of project planning and implementations. However, ongoing monitoring of IP's situation is carried out on a continuous basis along with monitoring of the entire community, as the IP and the non-IP communities live side by side, inter-mixed and with the same rights and risks.	Identification of issues that may affect Indigenous Peoples' rights takes into account both risks and opportunities	✓	No issues specific to indigenous people's rights were identified.
Management					
Measures are in place to address the Indigenous Peoples' rights at risk	✓	See above.	Measures to address ongoing or emerging issues that may affect Indigenous Peoples' rights at risk have been developed with the free, prior and informed participation of Indigenous Peoples	✓	See above.
Formal agreements are publicly disclosed	✓	There are formal agreements between the affected IPs and the	Processes are in place to anticipate and respond to	✓	The ongoing close consultations with the communities in the project area

Minimum Requirements			Advanced Requirements			
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations	
		project regarding land sales. These are publicly available at the land-registration office. Employment agreements for those IPs employed by the project are, however not disclosed publicly, as is common practice in both Nepal and globally.	emerging risks and opportunities		constitute a strong instrument for capturing any emerging risks and opportunities. In addition, the GRM in place is a well-functioning mechanism for alerting project management to emerging risks and opportunities.	
Conformance and Compliance						
Processes and objectives relating to Indigenous Peoples' rights at risk have been and are on track to be met with:			There are no non-compliances	✓	There are no non-compliances.	
• no major non-compliances	✓	There were no non-compliances identified in the project.				
• no major non-conformances	✓	The project has completed their commitments as agreed with the project-affected families of indigenous ethnicity.	There are no non-conformances	✓	All commitments made to the project-affected IPs are met at the time of the assessment.	
Commitments made to Indigenous Peoples have been or are on track to be met	✓	The commitment made to the indigenous people have been met and the project-affected IPs express satisfaction with the agreed solutions.				
Outcomes						
Processes provide for negative impacts of the project to Indigenous Peoples' rights to be avoided, minimised, mitigated or compensated	✓	There are no residual negative impacts affecting indigenous people as the project has avoided, minimised, mitigated or compensated all identified impacts in accordance with the agreements made with affected IPs.	Opportunities for positive impacts have been identified and maximised as far as practicable	✗	Opportunities have been identified in close cooperation with the affected IP families, but ongoing consultations with the project-affected IP households are not entirely effective. Several informants state a lack of active involvement on the part of the project after compensation was finalised. This constitutes a significant gap , as some opportunities could potentially go unidentified. It is possible that this gap will be closed in the medium-term future by the	

Minimum Requirements		Advanced Requirements	
Requirement is met: yes (✓) or no (✗)	Findings and Observations	Requirement is met: yes (✓) or no (✗)	Findings and Observations
			additional livelihood-improvement activities identified under the minimum-level requirements.
Processes provide some practicable opportunities for positive impacts to be achieved	✓ Affected IP families have been provided with employment by the project and the project is planning to implement additional livelihood-improvement activities for project-affected IP families in the near future.	✓ Opportunities for positive impacts have been or are on track to be achieved	✓ The identified opportunities are all on track.

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements.	7 out of the 8 advanced requirements are met.

Summary of findings and other notable issues
The project performs well in terms of Indigenous Peoples' issues. IPs make up around 50% of the total population in the project area, a situation typical of Nepal. One IP household has been physically displaced whereas 11 additional IP families are economically displaced. These people are well satisfied with the compensation regarding land and residence and attest to the fact that the project has fulfilled its commitments in full. There were no identified ongoing or emerging issues relating to the operating hydropower facility, affecting IPs. Some monitoring of the affected IPs is ongoing and the project, in close cooperation with affected IPs, has successfully identified some opportunities for positive impacts. However, consultations with some of the project-affected IP households has been weak or even non-existent since finalising the compensation packages. This constitutes a significant gap at the advanced-requirement level, as identification of some emerging risks and/or opportunities might be missed. However, plans to address this in the form of a livelihood-improvement programme are being drawn up and could potentially close this gap in the medium term.

Relevant evidence	
Interview	1, 2, 5, 6, 7, 14, 15, 16 17, 18, 22, 23
Document	1, 2, 5, 6, 10, 21, 22, 23, 30, 31, 32, 40
Photo	19, 31, 32, 33, 34, 35, 44

8 Cultural Heritage



Scope and Principle
This section addresses cultural heritage, with specific reference to physical cultural resources, associated with the hydropower facility. The principle is that physical cultural resources are identified, their importance is understood, and measures are in place to address those identified to be of high importance. This section does not address non-physical cultural resources, which are addressed in Section 1 and/or in Sections 5 and 7 when relevant.

Background	
Does the project affect any physical cultural resources? Please state the evidence on which this determination is made.	
Yes, this section is relevant	There is a temple associated with an annual cultural festival as well as two cremation sites that are directly affected by the project.
No, this section is not relevant	N/A

Sites of physical cultural heritage affected by or in proximity to the project-affected areas	How they are affected
A temple which is the focus of a cultural festival - Maghe Sankranti	It is held at the downstream end of the project, at the confluence of the Mai Khola and the Jogmai Khola. The festival is held once every year in the dry season and is associated with the river. A significantly higher flow than the minimum "e-flow" is required.
Cremation site (headworks)	Situated in close proximity to the headworks of the project. The actual cremation site is located just upstream of the headworks (not directly affected by the project).
Cremation site (close to the project camp)	Situated near the confluence of the Mai Khola and Jogmai Khola close to the project camp.

Agencies responsible for cultural heritage	The ward, the district and the local municipality
Other important local or regional cultural heritage values and issues	No

Minimum Requirements		Advanced Requirements	
Requirement is met: yes (✓) or no (✗)	Findings and Observations	Requirement is met: yes (✓) or no (✗)	Findings and Observations
Assessment			
Ongoing or emerging cultural heritage issues with respect	✓	In addition to issues that were identified in the Updated Initial Environmental Examination (UIEE)	Identification of ongoing or emerging cultural heritage issues takes broad
			✓
			The project has taken cultural-heritage issues into consideration over and above what is required. The

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
to physical cultural resources have been identified		and other associated assessments, there have been an ongoing dialogue with the local communities and wards as well as district and municipality administrations, to identify ongoing and emerging issues.	considerations into account, and both risks and opportunities		cremation site upstream of the headworks is, for example, not within the boundaries of the project but a commitment to assist financially to build the shelter with improved water point and toilet facilities on site was made and implemented. The project is also responsive to the local wards to release more water, both during the Maghe Sankranti festival and for cremations.
If management measures are required, then monitoring is being undertaken to assess if management measures are effective.	✓	The issues identified during the UIEE and other associated initial assessments are included in the management plans for the project which assign responsibilities with sufficient funding allocated for the implementation of the tasks The monitoring and evaluation measures have not been conducted to a fully satisfactory level this far into operation (only one monitoring report finalised) but evidence show that there are comprehensive processes in place to monitor the efficiency of cultural heritage management and monitoring is now on track.			
Management					
Measures are in place to manage identified cultural heritage issues	✓	See under assessment above	Processes are in place to anticipate and respond to emerging risks and opportunities	✓	See under assessment above
Conformance and Compliance					
Processes and objectives in place to manage cultural heritage issues have been and are on track to be met with:					
<ul style="list-style-type: none"> no major non-compliances 	✓	Two monitoring reports should have been submitted last year but only one was finalized. This is a gap against the requirement but is not a significant	There are no non-compliances	✓	The monitoring report that has been submitted is of good quality, but there should have been two reports submitted last year to fully meet the project's compliance with national regulation. As the project is now

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
		gap since the objective is on track to be met.			compliant with its monitoring responsibilities, the earlier non-compliance is considered a non-significant gap at the time of the assessment.
• no major non-conformances	✓	The project is living up to its own commitments made to the community and local administrations, see above.	There are no non-conformances	✓	There are no non-conformances identified.
Cultural heritage related commitments have been or are on track to be met	✓	The project is responsive to the local wards whenever there is a request for additional water releases related to cultural events (such as festivals and cremations). The project has also committed to construct a shelter with facilities at the cremation site upstream of the headworks, this work is ongoing.			
Outcomes					
Negative cultural heritage impacts arising from activities of the operating hydropower facility are avoided, minimised, mitigated and compensated	✓	The project has shown that it is responsive to emerging risks and opportunities to ensure that impacts are being minimised, mitigated and compensated.	Where opportunities have been identified, measures to address cultural heritage issues beyond those impacts caused by the facility have been or are on track to be achieved	✓	The commitment to assist with the construction of the shelter upstream of the headworks is a good example of issues beyond those caused by the facility.
List of significant gaps against Minimum Requirements			Number of Advanced Requirements met		
No significant gaps were found against the Minimum Requirements.			5 out of the 5 advanced requirements are met.		
Summary of findings and other notable issues					

The project's cultural-heritage management is in general very good, with comprehensive processes in place to monitor efficiency of cultural-heritage management. The only issue has been that two monitoring reports should have been submitted (one every 6 months), but the filing of the recent report means that this is no longer a significant gap at the time of the assessment. Furthermore, there are processes and procedures to address emerging risks and opportunities and the project is addressing issues that are beyond those impacts caused by the hydropower facility.

Relevant evidence	
Interview	1, 3, 5, 6, 13, 14, 18
Document	6, 10
Photo	1, 7, 39, 40, 41, 42, 43

9 Governance and Procurement



Scope and Principle

This section addresses corporate and external governance considerations for the operating hydropower facility. The principle is that the owner/operator has sound corporate business structures, policies and practices; addresses transparency, integrity and accountability issues; can manage external governance issues (e.g., institutional capacity shortfalls, political risks including transboundary issues, public sector corruption risks); and can ensure compliance.

Background

Key information on political context and public sector risks	<p>Nepal is a parliamentary republic with a multi-party system based on the constitution that was adopted in 2015. The events that led up to the constitution included the Nepal Civil War with more than 16 000 deaths during the late 90's, a democratic revolution in 2006, change from monarchy to federal republic in 2008 and finally two constituent assemblies over seven years before the final adoption. This history indicates that there are some general risks that the political landscape could change in the future. However, it is difficult to assess on what time horizon that change would occur, it can only be concluded that political stability is an area of risk in general.</p> <p>Another specific public-sector risk mentioned by several government officials is the severe lack of funds to conduct monitoring of hydropower plants and their governance and sustainability performance.</p>
Key information on corporate ownership and governance	The Mai Beni hydropower plant is operated by a single-purpose company named Sampling Power Co, a subsidiary of Urja Developers.
Details of the concession, if applicable	The license/concession is based on the build-own-operate-transfer (BOOT) principle and valid for 35 years, including construction. After that period the HPP will be handed over to the Nepalese state.
Key licenses or permits	Hydropower projects (HPPs) need a license from the Ministry of Energy, Water Resources and Irrigation, MoEWRI (more specifically the Department of Electricity Development - DOED) to operate. HPPs smaller than 50 MW (or 10MW in a conservation area) also need an approved Initial Environmental Examination (IEE) by DOED. Larger HPPs need an Environmental Impact Assessment (EIA) approved by the Ministry of Forestry and Environment (MoFE). There is one survey license for IEE/ESIA/feasibility studies and a construction license that will be issued after the approval of the IEE/EIA. The Mai Beni plant, given its size and location, has the DOED licence and an approved updated IEE (UIEE).

Other relevant information	N/A
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Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations	Requirement is met: yes (✓) or no (✗)	Findings and Observations		
Assessment					
Ongoing or emerging political and public sector governance issues have been identified	✓	The project is regularly assessing ongoing and emerging political risks, for instance it has been identified by the developer that there are difficulties in terms of communication with the local government after every election. The reason for this is that even key administrative functions at municipality and district level are elected, meaning that the institutional memory from the last 5-year period is partly lost when the newly elected officials enter into office.	There are no significant opportunities for improvement in the assessment of political and public sector governance issues and corporate governance requirements and issues	✓	The project demonstrates a good system for adaptive management and responds to emerging risks and opportunities with interventions suited for the local context (for example just sitting and waiting outside the local official's office until they can be received to reengage with the new official(s)). The cooperation with the IFC is a very important opportunity taken, demonstrating the company's willingness and intent to constantly improve.
Corporate governance requirements and issues have been identified	✓	The project has taken many steps throughout the last couple of years to improve its corporate governance. Engagement with the IFC a little over a year ago has identified a number of issues that are now in the process of being improved. Staff have gone through a FIDIC training, tender procedures have been improved and a variety of governance-relevant studies have been initiated.			
Monitoring is being undertaken to assess if corporate governance measures are effective	✓	The formal monitoring system is somewhat poorly defined. This is assessed as a non-significant gap since the issue is on track to be resolved through the IFC engagement. The project clearly shows that it is			

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
		working on constantly improving its corporate governance, but it is of the utmost importance that the IFC cooperation is continued and completed.			
Management					
Processes are in place to manage the following:					
• corporate, political and public sector risks	✓	The political situation described under assessment above is out of the project's control, but the project has systems in place to manage the situation by putting specific efforts into reengaging with the local government directly after elections (in this way updating the new officials on what the project has conducted in the area during the previous mandate period). A similar adaptive approach has been adopted for other emerging issues as well.	Processes are in place to anticipate and respond to emerging risks and opportunities	✓	The project applies processes for the identification of risks and opportunities, including a compliance officer fulfilling the competence requirements set out by the Securities Board of Nepal (SEBON) as well as regular independently audited compliance with the Directives on Good Corporate Governance of a Body Corporate, 2074 overseen by SEBON.
• compliance	✓	There are processes in place to manage all requirements set up by the government.			
• social and environmental responsibility	✓	The project has a clear agenda to meet these objectives and to exceed expectations in many areas.			
• procurement of goods and services	✓	There is a procurement policy in place with clear structure on how goods and services should be procured all the way from needs identification to final transport of goods to site and insurance of material	Contractors are required to meet or have consistent policies as the developer	✗	The project has tried to put environmental and social management requirements into the tender requirements, but Nepalese contractors could not live up to those standards and the company cannot

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
• grievance mechanisms	✓	A grievance mechanism is established for the project and the project is also in the process of developing a grievance mechanism for gender-based violence.			procure internationally since the Nepalese government has put several restrictions in this area. At the time of this assessment, it is assessed that the project has done what they can possibly do to improve their performance, but the lack of domestic capacity combined with regulations make it impossible to meet this requirement. This is a significant gap .
• ethical business practices	✓	The project indicates on its website that they operate through responsible business endeavours and with core values such as respect, openness, self-direction, integrity and balance. This is supported by a recently updated HR Policy containing significant aspects of ethical and transparent business practices.			
• transparency	✓	See above.			
Policies and processes are communicated internally and externally as appropriate	✓	Policies are communicated in a satisfactory manner internally and externally and auditing reports are published on the Samling Power Company web site.	Procurement processes include anti-corruption measures as well as sustainability and anti-corruption criteria specified in pre-qualification screening	✗	
In case of capacity shortfalls, appropriate external expertise is contracted for additional support	✓	Yes, consultants are hired from time to time to cover for capacity shortfalls.			
Conformance and Compliance					
The project has no major non-compliances	✓	Two monitoring reports should have been submitted during the last year, but only one was filed, recently, with the regulator. The project is, hence, presently in compliance, but need to rigorously ascertain that each new monitoring report is filed on time as	The project has no non-compliances	✓	At the time of the assessment the project is compliant in all areas. Compliance with the Directives on Good Corporate Governance of a Body Corporate, 2074, has been audited by an independent auditor.

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
		this would otherwise constitute a gap against the standard.			
Outcomes					
There are no significant unresolved corporate and external governance issues identified	✓.	There are records showing that grievances and financial issues have been identified, followed-up and completed. There are no ongoing significant unresolved issues.	There are no unresolved corporate and external governance issues identified	✓	There are no unresolved issues at the time of the assessment.

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements.	4 out of the 6 advanced requirements are met.

Summary of findings and other notable issues
The project, and Urja as the parent company, generally show good governance and procurement procedures, and have also made substantial improvements in this area recently, partly as a result of the engagement with the IFC. In terms of advanced requirements, there are a few significant gaps – contractors are not required to meet or have consistent policies as the developer and there are no sustainability, nor anti-corruption, criteria in supplier/tenderer pre-qualification. These gaps are out of Urja’s/Samling’s control, since there are no local contractors that live up to either Urja’s standard or the advanced-level requirement assessed here, and Nepali companies are not allowed to screen out all national bidders and turn to foreign companies on these grounds. These gaps are issues the project (at present) is unable to address, but they still constitute significant gaps.

Relevant evidence	
Interview	1, 3, 4, 5, 6, 9, 10, 11, 13, 14, 18
Document	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 21, 22, 27, 39, 40, 41, 42, 59
Photo	35, 44, 47

10 Communications and Consultation



Scope and Principle	
This section addresses ongoing engagement with project stakeholders, both within the company as well as between the company and external stakeholders (e.g., affected communities, governments, key institutions, partners, contractors, catchment residents, etc). The principle is that stakeholders are identified and engaged in the issues of interest to them, and communication and consultation processes maintain good stakeholder relations throughout the project life.	

Background	
Directly affected community-level stakeholders	The local communities in the two project-affected wards.
Directly affected institutional-level stakeholders	Ward-, district-, regional- and national-level government agencies, the IFC and USAID, as partners in Urja's (in general) and Samling's (in particular), sustainability efforts.
Other relevant information	N/A

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
Assessment					
Ongoing or emerging issues relating to hydropower facility communications and consultation have been identified	✓	Samling staff at site and Urja staff for the national-level aspects, have identified all relevant communication and consultation issues for the Mai Beni HPP. A good-quality project-specific Stakeholder Engagement Plan (SEP) has been developed with IFC's assistance.	The stakeholder mapping takes broad considerations into account	✓	The SEP includes a detailed stakeholder-mapping exercise dividing stakeholders into 4 different categories in relation to their level of influence and interest. This is then developed into an engagement strategy with defined activities, frequency, information sought and responsible actor(s).
Requirements and approaches are determined through a periodically updated assessment process involving stakeholder mapping	✓	Detailed stakeholder mapping is a part of the SEP.			
Effectiveness is monitored	✓	The Community Liaison Officer (CLO) keeps records of activities and their outcomes			

Management					
Communications and consultation plans and processes are in place to manage communications and engagement with stakeholders	✓	The SEP and the CLO function, see above.	Communication and consultation plans and processes show a high level of sensitivity to communication and consultation needs and approaches for various stakeholder groups and topics	✓	The SEP is very detailed in its assessment and outlining of necessary actions in these aspects.
They include an appropriate grievance mechanism	✓	A good international-standard grievance mechanism (named a Grievance Redress Mechanism – GRM in the Mai Beni project) has been established with the aid of the IFC.	Processes are in place to anticipate and respond to emerging risks and opportunities	✓	The high level of group-specific identification of needs and approaches in the SEP in combination with the GRM
They outline communication and consultation needs and approaches for various stakeholder groups and topics	✓	A very detailed stakeholder mapping exercise outlines needs and approaches for all relevant stakeholder groups and topics.			
Stakeholder Engagement					
The project operation stage involves engagement with directly affected stakeholders	✓	Small-group community consultative meetings and short training events, on the Grievance Redress Mechanism (among other issues), plus the CLO team’s ongoing engagement.	Engagement is inclusive and participatory	✓	All evidence points to an open, inclusive and participatory approach to engagement being adopted by project staff.
Engagement is:					
• appropriately timed and scoped	✓	In the operation phase engagement takes place in two ways – as standard contact by the CLO team and in response to requests and grievances. Evidence shows that this is timely appropriately scoped, often two-way and undertaken in good faith.	Negotiations are undertaken in good faith	✓	Interviewees, among these both project-affected people and a ward chief, attest to openness and honesty in negotiations. The clear satisfaction on the part of the physically and economically displaced households with their compensation packages is further evidence of a good-faith behaviour on the part of the project.
• often two-way	✓				
• undertaken in good faith	✓				
The business interacts with a range of directly affected	✓	The project interacts with local project-affected community members	The assessment and management process for	✓	The main management component for engagement on the downstream-

stakeholders to understand issues of interest to them		at both individual and group level in order to both inform about the project's work and learn about issues of importance to the community.	downstream flow regimes has involved appropriately timed and two-way engagement with directly affected stakeholders		flow aspect is the contacts with ward officials and/or individual in the project-affected area whenever events are planned which will require additional water releases in the dewatered river stretch. These contacts appear to be both appropriately times and two-way.
Ongoing processes are in place for stakeholders to raise issues and get feedback	✓	This is managed through the CLO team, the GRM and regular direct contacts between project staff and stakeholders.	Ongoing processes are in place for stakeholders to raise issues with downstream flow regimes and get feedback	✓	This is managed through the CLO team, the GRM and regular direct contacts between project staff and stakeholders.
Ongoing processes are in place for:		See above.	Feedback on how issues raised have been taken into consideration has been thorough and timely	✓	The grievance records clearly show a thorough and timely response on the part of the project, and interviewees attested to the fact the project is responsive.
• environmental and social issues	✓		Project-affected communities have been involved in decision-making around relevant issues and options	✓	The main relevant issues have been project support for roads and cultural aspects, and the project-affected communities have been and are closely involved, often initiators, in these discussions and decision.
• project-affected communities	✓		Resettlees and host communities have been involved in decision-making around relevant issues and options	✓	There is no host community, as the only physically-displaced household was given a new property with land title within the same community they lived in before. The displaced household attests to their involvement.
• resettlees and host communities	✓				
• Indigenous Peoples	✓				
• employees and contractors on human resources and labour management issues	✓				
• management of climate risks	✓				
Channels of communication with Indigenous Peoples are maintained	✓	The IP share of the population is close to or around 50%, living interspersed with non-IP people, as is the pattern in much of Nepal. The same channels of communication is maintained for	Directly affected Indigenous Peoples have been involved in decision-making around relevant issues and options	✓	Yes, all directly-affected IPs have been involved in the decision-making about relevant issues.

		all project-affected community members.			
These channels are:					
• appropriately timed	✓	See above.			
• culturally appropriate	✓				
• two-way	✓				
A mutually-agreed disputes procedure is in place with Indigenous Peoples	✓				
Public disclosure:					
• the business makes significant project reports publicly available	✓	Yes, significant project reports such as Annual Reports and UIEE are publicly available.	The business makes significant project reports publicly available	✓	This is a duplication of the minimum-level requirement, see answer to the left.
• the business publicly reports on project performance, in some sustainability areas	✓	The bi-annual monitoring reports to the Department of Electricity Development (DoED) as well as the UIEE and the project-specific handbook for community support are all available on the project's web site.	The business publicly reports on project performance in sustainability areas of high interest to its stakeholders	✓	See statement to the left under minimum-level requirements.
• power density calculations, estimated GHG emissions, and / or the results of a site-specific assessment are publicly disclosed	✓	No, but this is a non-significant gap as the project is run-of-river with a minute intake pond and a calculated power density of close to 10 000 W/m ² .	The assessment of project resilience is publicly disclosed	✓	There is no project-specific resilience assessment conducted. This is, however assessed as a non-significant gap given the project context and scope.
Conformance and Compliance					
Processes and objectives relating to communications and consultation have been and are on track to be met with:					
no major non-compliances	✓	There are no major communication and consultation-related non-compliances.	There are no non-compliances	✓	There are no communication and consultation-related non-compliances. However, there are elected district- and municipal-level officials who claim the existence of a number of regulatory shortcomings (not addressing key project-affected

					stakeholders’ needs). Visual evidence proves these concerns to be either non-existent, outdated and/or long-since addressed and of a nature that can be identified as benefits, not regulatory requirements. See also Topic 9 for issues related to elected officials.
• no major non-conformances	✓	All consultation-related processes and objectives, including own commitments, have been and are on track to be met with no major non-conformances through the CLO and his assistants.	There are no non-conformances	✓	A few high-level elected district and municipal officials which have taken up office fairly recently claim that the project communicates poorly and is generally deficient in many aspects. These complaints are generally found to be inaccurate upon field inspection and the CLO and other senior project ESG staff have recently been successful in addressing such complaints through targeted engagement.
Communications related commitments have been or are on track to be met	✓	See above.			

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements	16 out of the 16 advanced requirements are met.

Summary of findings and other notable issues

Communication and consultations are well cared for in the project. The Community Liaison Officer with his assistants regularly move around the small project-affected area meeting people on an ad hoc basis to keep abreast of opinions and requests for support. The grievance redress mechanism is well-managed, and stakeholders attest to general satisfaction with the project’s communications. The only exception to this is a few elected district- and municipal-level officials who have concerns. This is further dealt with under Topic 9.

Relevant evidence	
Interview	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24
Document	1, 2, 3, 4, 5, 6, 8, 10, 11, 12, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 44, 54
Photo	6, 7, 9, 13, 21, 22, 23, 24, 26, 27, 28, 29, 44, 45, 46, 47

11 Hydrological Resource



Scope and Principle

This section addresses hydrological resource availability and reliability, reservoir management, and downstream flow regimes in relation to the operating hydropower facility. The principle is that power generation planning and operations take into account hydrological resource availability and reliability in the short- and long-term, that the reservoir is well managed taking into account power generation operations, environmental and social management requirements, and multi-purpose uses where relevant, and that issues with respect to downstream flow regimes are identified and addressed.

Background

Hydrology and flows

Average flow at dam (m ³ / s)	The Q50% (50% exceedance probability of the flow duration curve) at the site is around 5.5 m ³ /s (design discharge is equivalent to Q40%), average yearly flow is 12.75 m ³ /s
Minimum monthly average flow (m ³ / s)	2.42 m ³ /s
Maximum monthly average flow (m ³ / s)	33.77 m ³ /s
Lowest observed flow (m ³ / s)	The project's Hydrology Resource Study does not contain an actual measured lowest observed flow but uses records with appropriate methodology to define return periods for 1-day, 7-day and 30-day average low flows. The 1-day low flow with a 20-year return period is calculated as 0.298 m ³ /s.
Highest observed flow (m ³ / s)	The project's Hydrology Resource Study does not contain an actual measured highest observed flow but uses records with appropriate methodology to define return periods for flood flows. The 20-year flood flow based on a regional analysis is just under 700 m ³ /s. The highest discharges thus far observed at the plant during its operation was just under 40 m ³ /s, measured on the 19 th of October 2021 and again on the 17 th of June, 2023.
Design flow (m ³ / s)	8.02 m ³ /s
Affected river reaches (start/end and how affected)	The stretch of Mai Khola from the intake and down to powerhouse (a stretch of 4.8 km) is affected, the diversion of river water to the intake changes the discharge of the river. The change in the wet season is not considered significant but in the dry season (7 months) the flow will be significantly reduced.
Proposed downstream flow regimes for environmental or social objectives	0.25 m ³ /s, corresponding to 10% of the average flow of the driest month in accordance with the Hydropower Development Policy 2001. This will be released regularly from the weir axis to the Mai Khola.

Reservoir	
Reservoir length (km)	Approximately 0.05 (50 metres)
Minimum operating level MOL (m.a.s.l.)	640 m.a.s.l.
Normal operating level (m.a.s.l.)	640 m.a.s.l.
Full supply level FSL (m.a.s.l.)	640 m.a.s.l.
Reservoir area at FSL (km ²)	Approximately 1 000 m ² based on a length of app. 50 metres and 10 metres wet area added on each side of the original riverbed.
Reservoir area at MOL (km ²)	See above under FSL area, as the FSL and MOL are the same.
Volume at FSL (million m ³)	The stored volume in the intake pond, in excess of the pre-project river section, is so small – approximately 1 000 m ³ only, as to render these aspects not applicable. Even in the dry season, with a minimum average monthly flow around 2.5 m ³ /s, the pond’s volume is equivalent to less than 7 minutes’ discharge.
Volume at MOL (million m ³)	
Average retention time in days	
Number of days for filling	
Other relevant information	The Mai Beni project does not have a storage reservoir, but only an overflow weir allowing diversion of river discharge into the intake and project waterways. The pond created by the damming effect of the weir covers only about 1 000 m ² more than the original riverbed.

Minimum Requirements		Advanced Requirements	
Requirement is met: yes (✓) or no (✗)	Findings and Observations	Requirement is met: yes (✓) or no (✗)	Findings and Observations
Assessment			
Ongoing or emerging issues in the following areas have been identified:			
<ul style="list-style-type: none"> hydrological resource availability and reliability 	<p style="text-align: center;">✓</p> <p>The hydrological resource baseline from the UIEE appears to have been correctly assessed in terms of water availability for power production, this is proven by the fact that the facility generally has been running as designed for almost two years while also successfully fulfilling its downstream flow requirement. A recent project-specific Hydrological Resource Study has added to the UIEE data base. However, hydrological variability has caused</p>	<p>Issues that may impact on water availability or reliability have been comprehensively identified</p>	<p style="text-align: center;">✗</p> <p>The recently installed rainfall and water-level gauges are one step in the direction of identifying the potential existence and scale of such issues. A project-specific Hydrological Resource Study has also been implemented recently which includes some aspects of risks related to availability or reliability of water in the near to long-term future (such as increased water demand upstream etc.). This assessment is, however, not comprehensive in</p>

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
		problems – see Topic 4. This is a gap, but not significant for this requirement.			nature. This constitutes a significant gap .
• reservoir management	✓	N/A			
• downstream flow regimes	✓	The project meets the required downstream flow release of 10% of the minimum average monthly flow. This figure is not based on a comprehensive needs assessment, but an e-flow study conducted after operation began has shown that an increase of the e-flow to the extent where it would make a difference for the biodiversity of the river would cause the project to become financially unviable.	Scenarios, uncertainties and risks for water availability and reliability are routinely and extensively evaluated over the short- and long-term	✗	See above
If management measures are required, then monitoring is being undertaken to assess if management measures are effective:					
• reservoir management	✓	N/A			
• downstream flow regimes	✓	Water levels at the headworks is monitored on a daily basis to ensure that the 10% e-flow is successfully passed over the weir and into the dewatered stretch of the river.			
Monitoring is being undertaken of hydrological resource availability and reliability	✓	The project has established five rainfall stations and two water-level gauges in the catchment area to monitor the availability of water, that e-flow requirements are met and when rainfall or discharge reach levels that necessitate an emergency response.	Identification of ongoing or emerging reservoir management issues takes into account both risks and opportunities	✓	N/A as there is no reservoir to manage.

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
Inputs to this monitoring include:			Issues identification relating to downstream flow regimes takes into account both risks and opportunities	✓	A comprehensive e-flow study has been conducted, as well as a Rapid Cumulative Assessment (RCIA, unfinished but being prepared) that included identification of the stated objectives. However, presently the project is mainly focused on meeting the demand of releasing the 10% e-flow that is required of them with occasional increased flows for cultural heritage-related issues (see Topic 8), this is a gap but not a significant one since it is on track to be met.
• field measurements	✓	Five automatic rainfall measurements stations and two gauging stations for water levels have been installed in the catchment and on the river stretch to monitor the hydrology of the area.	An assessment has been undertaken that includes identification of the flow ranges and variability to achieve different environmental, social and economic objectives based on field studies as well as relevant scientific and other information	✓	A comprehensive e-flow study has been conducted
• appropriate statistical indicators	✓	Hydrological trends and variability were assessed in the UIEE, and the Hydrological Resource Study is evidence that this is on track to be followed up as part of monitoring during operation. Urja, as the parent company, has hired a hydrological expert to assess and monitor the hydrological conditions.			
• issues which may impact on water availability or reliability	✓	There is a regional network among the power companies operating in the river basin, identifying and			

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
		communicating water-availability issues.			
• a hydrological model	✓	A hydrological model has been setup by the disaster-management network and could potentially be used for assessing future water availability in the river basin.			
Management					
Measures are in place to guide generation operations that are based on:					
• analysis of the hydrological resource availability	✓	See “inputs to this monitoring include” under assessment above	Planning of generation operations has a long-term perspective	✓	The facility is operated under a BOOT (build-own-operate-transfer) agreement which makes the developer’s time-horizon limited to 35 years, and within this timeframe they show that they do have a long-term perspective in terms of good maintenance procedures, and processes to identify hydrology-related emerging risks and opportunities related to the management of the facility.
• a range of technical considerations	✓	See “inputs to this monitoring include” under assessment above	Planning of generation operations fully optimises and maximises efficiency of water use	✓	The project maximises the efficiency of water use to the extent possible as a run-of-river project.
• an understanding of power system opportunities and constraints	✓	See “inputs to this monitoring include” under assessment above	Planning of generation operations has the flexibility to anticipate and adapt to future changes	✗	The project has already encountered issues with hydrological variability, why it cannot be considered flexible to anticipate and adapt to future changes yet. This is a significant gap . The work recently started with the Hydrological Resource Study, in combination with ongoing work on climate change and resilience (see Topic 12) has the potential to close this gap in the medium-term future.

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
Measures are in place to manage identified reservoir management issues	✓	N/A	Processes are in place to anticipate and respond to emerging risks and opportunities for reservoir management	✓	N/A
Measures are in place to address identified downstream flow issues	✓	The facility meets the requirement of 10% e-flow as well as an increased flow during the time of the annual cultural event downstream. In addition to the above, they also release additional water at times when the local ward makes specific (most often cremation-related) requests, see also Topics 4 and 8.	Processes are in place to anticipate and respond to emerging risks and opportunities for downstream flow regimes	✓	Considerations have been made for basin-wide issues and management (such as the disaster-management plan, the early-warning system and a rapid cumulative impact assessment under way). All these considerations are initial steps towards promotion of sustainability and integrated water resources management on a basin-wide scale, including downstream flows.
Where formal commitments have been made to downstream flow regimes, these are publicly disclosed	✓	Yes, some of the commitments are included in the UIEE that is publicly disclosed. The other commitments are not formal and just based on specific requests from the ward.	Commitments are made in relation to downstream flow regimes that include the flow objectives; the magnitude, range and variability of the flow regimes; the locations at which flows will be verified; and ongoing monitoring	✓	Commitments have been made in relation to downstream flow regimes that include flow objectives and magnitude (such as for the cultural event) and flows can be verified and continuously monitored.
Conformance and Compliance					
Processes and objectives in place to manage each of the following have been and are on track to be met:			There are no non-compliances relating to:		
• reservoir management, with no major non-compliances	✓	N/A	• reservoir management	✓	N/A
• reservoir management, with no major non-conformances	✓	N/A			

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
• downstream flow regimes, with no major non-compliances	✓	The project monitors the continuous release of the downstream flow identified in the UIEE.	• downstream flow regimes	✓	There are no non-compliances related to downstream flow regulations
• downstream flow regimes, with no major non-conformances	✓	The project is conformant with its own undertakings, e.g., increased releases for cultural purposes.			
Commitments relating to the following have been or are on track to be met:			There are no non-conformances relating to:		
• reservoir management	✓	N/A	• reservoir management	✓	N/A
• downstream flow regimes	✓	The project is meeting its commitment to release additional water whenever the wards submit a reasonable request to do so.	• downstream flow regimes	✓	There are no non-conformances
Outcomes					
Downstream flow regimes take into account environmental, social and economic objectives	✓	The general requirement in Nepal includes the environment (the required 10% of the minimum monthly flow), consideration has also been made in relation to culture (the cremations and the annual festival) and to economic objectives (irrigation practices along the dewatered stretch have been investigated but found to be non-existing).	Downstream flow regimes and commitments are an optimal fit amongst environmental, social and economic objectives within practical constraints of the present circumstances	✗	As mentioned above there have been some initiatives taken to promote sustainability and integrated water resources management on a basin-wide scale, including a project-specific comprehensive EFlow study, but not comprehensively enough to meet the requirements of an optimal fit amongst the different stated objectives.
Where relevant, they also take agreed transboundary objectives into account,	✓	N/A			
List of significant gaps against Minimum Requirements			Number of Advanced Requirements met		
No significant gaps were found against the Minimum Requirements			12 out of 16 advanced requirements are met		

Summary of findings and other notable issues

The project presently monitors and manages its hydrological resources and ensures that downstream-flow requirements are met. The lack of appropriate statistical indicators used for monitoring at the time of the assessment is a gap, however, the project has shown that this requirement is on track to be met through the Hydrological Resource Study and the recruitment of a hydrologist at Urja, who will be responsible for these issues. This is a promising development since variability beyond what was understood during the feasibility studies has already caused a long shut-down of the plant with significant costs incurred, both for repairs and for lost revenue. A number of steps have been taken recently to meet the advanced requirements, among these are an e-flow assessment and an ongoing study of cumulative impacts, but there still is no satisfactory assessments done for issues that may affect future water availability or reliability (such as climate change or increases in upstream water demand).

Relevant evidence

Interview	1, 5, 6, 8, 11, 13, 14, 18
Document	6, 10, 11, 12, 33, 37, 47, 48, 49, 56, 58
Photo	1, 2, 14, 22, 25, 37, 48, 49, 50

12 Climate Change Mitigation and Resilience



Scope and Principle	
This section addresses the estimation and management of the project's greenhouse gas (GHG) emissions, analysis and management of the risks of climate change for the project, and the project's role in climate change adaptation. The principle is that the project's GHG emissions are consistent with low carbon power generation, the project is resilient to the effects of climate change, and the project contributes to wider adaptation to climate change.	

Background	
Climate Change Mitigation	
Capacity (MW) (or additional capacity in case of expansion/ rehabilitation projects)	9.51
Average reservoir area (representing area of flooded land, net of pre-impoundment water body) (km ²) (or additional reservoir area if any, for expansion/rehabilitation projects)	Approximately 0.1 ha (the intake pond is approximately 0.2 ha, with 0.1 being original river area).
Power density (W/m ²)	> 9 000
Emissions intensity (gCO ₂ e / kWh)	N/A
National and regional policies, plans and commitments relevant to mitigation	Climate Change Policy 2076 (2019) Nepal's Nationally Determined Contributions (NDCs) Nepal's pledge to achieve net zero emissions by 2045
Climate Change Resilience	
Hydrological data available for the project site and the basin, and observed climate trends	There is a network of hydrological gauging stations that has been established by the project in cooperation with USAID. Historic hydrological and meteorological data and climate trends are available from the Department of Hydrology and Meteorology (DHM).
Regional and basin-level climate models relevant to the project location, if any	The Coupled Model Inter-comparison Project Phase 5 (CMIP5 basis for IPCC AR5) – spatio-temporal trends of temperature and precipitation, climate change indicators. IPCC's downscaled climate projections for high mountain areas
Any climate change predictions for the project location, and degree of consistency	The general trend in the hilly areas of Nepal (where Mai Beni is situated) indicates a situation with more extremes in the future where the dry seasons will be drier, and the monsoon seasons will have increased levels of precipitation. This trend is already observed at the short to medium term why it can be assumed that there is a good degree of consistency that this trend will continue in the long-term. There are several sources for climate change predictions for the country and the region: Ministry of Forests and Environment's (MoFE) climate change scenarios for Nepal (for the National Adaptation Plan)

	<p>DHM, Observed Climate Trend Analysis in the Districts and Physiographic Zones of Nepal (1971-2014)</p> <p>Hydrological model developed as part of the “Future changes in hydro-climatic extremes in the Upper Indus, Ganges, and Brahmaputra River Basins report”.</p> <p>European Centre for Medium-Range Weather Forecasts (ECMWF) - ERA5-land, climate trends from 1950-present.</p> <p>Vulnerability Assessment and Stress Test of Hydro-electricity Sector in Nepal</p> <p>Köppen-Geiger Maps of present and future climate classifications</p>
National policies, plans and commitments relevant to adaptation and resilience	<p>Climate Change Policy 2076 (2019)</p> <p>Nepal’s Nationally Determined Contributions (NDCs) (e.g., all 753 local governments will prepare and implement climate-resilient and gender-responsive action plans by 2030.)</p> <p>National Adaptation Plan (2021-2050)</p> <p>The adoption of a Green, Resilient, and Inclusive Development (GRID) approach (2021)</p> <p>The Hydropower Environmental Impact Assessment Manual (2018) is not directly relevant for this project in terms of compliance, since the project only needed to conduct an IEE. However, the climate change and resilience-relevant guidelines of the manual could guide the project in its efforts to meet the requirements of this Topic.</p>
Other relevant information	N/A

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
Assessment					
Climate Change Mitigation					
If power density is below 5 W/m ² , net GHG emissions (gCO ₂ e) of electricity generation are calculated, independently verified and periodically updated	✓	This section is not applicable since the power density is much higher than 5 W/m ²	If a site-specific assessment is required, it incorporates a broad range of scenarios, uncertainties and risks	✓	Not required.
If power density is below 5 W/m ² and estimated emissions are above 100 gCO ₂ e/kWh, a site-specific assessment of GHG emissions is undertaken and periodically updated	✓	See above.			
Climate Change Resilience					

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
An assessment of the project's resilience to climate change is undertaken and periodically updated	✓	Significant assessment of climate change mitigation and resilience was undertaken during the project's feasibility studies (FS), based on e.g., ADB work, as well as Nepal-specific studies undertaken by e.g., MoFE, DHM and ICIMOD. The Project is working, using the FS and these external sources, to develop a specific risk classification which will inform a project-specific definition of resilience measures. The requirement is, hence, on track to be met.			
The assessment:			Assessment of resilience incorporates sensitivity analysis, project specific hydrological modelling using recognised climate models	✗	The regional studies incorporate a sensitivity analysis with recognised climate models, but a project specific downscaling has not been performed. This is a significant gap .
• incorporates an assessment of plausible climate change at the project site	✓	While the above-mentioned regional studies incorporate plausible climate change scenarios in the project area there was no project-specific assessment for the Mai Beni project. This is not considered a significant gap for the same reasons as stated above.			
• identifies a range of climatological and hydrological conditions at the project site	✓	The above-mentioned regional studies incorporate a range of climatological and hydrological conditions in the project area, but a project-specific assessment of the effects on the project has not been conducted. This is not considered a significant gap for the same reasons as stated above.			

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
<ul style="list-style-type: none"> applies these conditions in a documented risk assessment or stress test 	✓	The project has applied the above-mentioned conditions in a risk assessment for the project which confirms that the project is located in a low to moderate risk zone in terms of climate risk, and adaptation measures reduces the risks further.			
The risk assessment or stress test encompasses:			The project's opportunities to provide adaptation services are considered on an ongoing basis	✗	There are a number of considerations that have been made in relation to basin-wide issues and management (such as the disaster management plan and the early-warning system where data collected could be used for a project specific assessment of climate change resilience). However, no assessment has yet been conducted to assess any risks or opportunities specifically related to resilience. This is a significant gap .
<ul style="list-style-type: none"> dam safety 	✓	Similar conclusions are valid for this section as under "applies these conditions in a documented risk assessment" above. However, Topic 4 considers dam-safety issues with climate change impacts in mind why this is considered a gap but not a significant one, see Topic 4.			
<ul style="list-style-type: none"> other infrastructural resilience 	✓	The same applies here as under "dam safety" above.			
<ul style="list-style-type: none"> environmental and social risks 	✓	The project is located in a river which does not drain areas with glaciers. It is, hence, not susceptible to glacial-lake outburst floods (GLOFs) or highly sensitive to reduced water storage in the form of snow cover.			
<ul style="list-style-type: none"> power generation availability 	✓	See above.			
Management					
Climate Change Mitigation					
If GHG emissions estimates assume design and management measures, these measures are in place	✓	This section is not applicable since the power density is considerably higher than 5W/m ²	Management measures are in place to respond to risks and opportunities including offsetting emissions	✓	N/A

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)	Findings and Observations		Requirement is met: yes (✓) or no (✗)	Findings and Observations	
			Plans are in place to monitor parameters used in GHG emissions estimates or to monitor GHG stocks	✓	N/A
Climate Change Resilience					
Measures are in place to avoid or reduce identified climate risks	✓	Given the low-risk classification of the Mai Khola catchment, the project has satisfactory adaption measures in place to avoid or reduce climate risks.	Measures take account of a broad range of risks and interrelationships	✗	See under assessment above. This is a significant gap.
			Processes are in place to respond to unanticipated climate change	✗	See under assessment above. This is a significant gap.
			Plans are in place to provide adaptation services if necessary	✗	See under assessment above. This is a significant gap.
Conformance and Compliance					
Climate Change Mitigation					
Processes and objectives relating to mitigation have been and are on track to be met with:			There are no non-compliances	✓	Click here to enter text.
• no major non-compliances	✓	There are no specific regulations relating to climate change			
• no major non-conformances	✓	No commitments specific to climate change have been made			
Mitigation-related commitments have been or are on track to be met	✓	No commitments specific to climate change have been made	There are no non-conformances	✓	Click here to enter text.
Climate Change Resilience					
Processes and objectives relating to resilience have been and are on track to be met with:			There are no non-compliances	✓	There can be no non-compliances as there are no regulations specific to climate change.
• no major non-compliances	✓	There are no specific regulations relating to climate change			
• no major non-conformances	✓	No commitments have been made relating to climate change			
			There are no non-conformances	✓	

Minimum Requirements			Advanced Requirements		
Requirement is met: yes (✓) or no (✗)		Findings and Observations	Requirement is met: yes (✓) or no (✗)		Findings and Observations
Resilience-related commitments have been or are on track to be met	✓	No commitments have been made relating to resilience			There are no non-conformances since there are no climate change-related commitments made.
Outcomes					
Climate Change Mitigation					
The project's GHG emissions are demonstrated to be consistent with low carbon power generation	✓	The power density is much higher than 5 W/m ²	Project net emissions are minimised, or project operations facilitate system emissions reductions	✓	Project net emissions are negligible and given the almost non-existent pondage at the intake, the project will likely facilitate system emission reductions.
Climate Change Resilience					
Findings of the climate change assessment indicate that the project is resilient to climate change	✓	See under assessment above – the project can, based on the low climate risks, considered to be resilient to climate change.	The project is resilient under a broad range of scenarios	✗	See under assessment above, no specific resilience study has been undertaken yet, so this cannot be demonstrated. This is a significant gap .
			The project will contribute to climate change adaptation at a local, regional or national levels	✓	See under assessment above, no adaptation-specific services are identified and planned. However, it is likely that the project will contribute to adaptation by default, making this a non-significant gap.

List of significant gaps against Minimum Requirements	Number of Advanced Requirements met
No significant gaps were found against the Minimum Requirements	9 out of 15 advanced requirements are met

Summary of findings and other notable issues

The project is a small hydropower project that falls under the lower requirements for environmental impact assessment (an IEE) under the Nepalese regulations. As such, no assessment of climate-change impacts or how national and regional projections and adaptation recommendations will affect the project were conducted (the approved updated IEE does not even mention the concept of climate change) during the early stages of the project, however, the project has conducted a recent study to downscale the many regional and national studies on climate change to the project level. This study has concluded that the climate

risk in the area is low to moderate, and that project operations together with adopted adaptation measures makes the risks even lower. As a result of this study, the project can be considered resilient to climate change at the minimum-requirement level but still needs to conduct further work in order to close the gaps at the advanced-requirement level.

Relevant evidence	
Interview	1, 5, 6
Document	10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 45, 46, 47, 48, 49, 56, 57, 58, 60, 61, 62, 63, 64, 65
Photo	22, 48, 49

Appendix 1 – Interviews

Ref	Interviewee/s, Position	Organisation	Date	Location
1	Urja Senior Management and E.S.G. HQ team	Urja Developers, HQ	14 May	Kathmandu
2	Dr Ganesh Prasad Neupane, Urja E.S.G. General Manager; and Bachchu Raj Pande, Social Safeguard & Land Management Specialist	Urja Developers, HQ	14 May	Kathmandu
3	Kalandika Rana – Corporate Governance Officer	Urja Developers	14 May 2023	Kathmandu
4	Melina Magar – Procurement Officer	Urja Developers	14 May 2023	Kathmandu
5	Homi Jyoti Adhikari – ESHS specialist (multiple discussions)	Urja Developers	14-21 May	Kathmandu and Ilam
6	Dr Ganesh Prasad Neupane, ESG General Manager (multiple discussions)	Urja Developers	14-21 May	Kathmandu and Ilam
7	Jahanzeb Murad, Operations Officer	IFC	15 May	Kathmandu
8	Bikram Paudel, Manager; and Mandira Adhikary, Assistant Manager	Nepal Electricity Authority (NEA)	15 May	Kathmandu
9	Ram Gopal Kharbuja, Joint Secretary	Ministry of Energy, Water and Irrigation (MoEWRI)	15 May	Kathmandu
10	Mandevi Shrestha, Deputy Director General	Department of Electricity Development (DoED), in MoEWRI	15 May	Kathmandu
11	Madhu Ghimire, Undersecretary	Ministry of Forest and Environment (MoFE)	15 May	Kathmandu
12	Group interview with mid-level and senior power plant staff plus two HQ staff	Samling Power Co., Urja Developers	16 May	Ilam, Mai Beni HPP
13	Santosh Mandal – Deputy Plant Manager, Mai Beni (multiple discussions)	Samling Power Co.	16-20 May	Ilam
14	Roshan Bhandari – ESHS officer (multiple discussions)	Samling Power Co.	16-20 May	Ilam
15	Buddha Bahadur Tamang, IP and resettlee; and Tej Bahadur Tamang, IP	Local community, Indigenous Peoples and the one resettlee of the project	17 May	Ilam, house of Buddha Bahadur Tamang
16	Dik Kumari Gole Tamang, Samling employee and IP	Samling Power Company, Local community and Indigenous Peoples	17 May	Ilam, Mai Beni HPP
17	Roshan Bhandari, ESHS Officer, Deepak Dhungana and Tuka Nath Phuyel, both Community Liaison Officers for Mai Beni and Jogmai	Urja Developers and Samling Power Company	17 May	Ilam, Mai Beni HPP

	hydropower projects. Mr Dhungana is also the company's compliance officer.			
18	Dalman Tamang, Ward Chief	Ilam Ward number 8	18 May	Ilam
19	Bishnu Kumari Dahal, "Upa Pramukh"; and Om Nath Pradhan, "Dilip"/Ward Chief	Ilam City Council and Ilam Ward number 10, respectively	18 May	Ilam
20	Shrawan Kumar Pokhrel	Chief District Officer	18 May	Ilam
21	Bimala Dahal, economically-displaced; and Prakash Dahal, economically-displaced	Local community, non-IP	19 May	Ilam, house of Dahal family
22	Hira Kaji Ghale, Team Leader; Subodh Niraula, geologist; Binod Niraula, governance; and Ghanendra Bhandari, electrical engineer	Namsaling Community Development Centre (NCDC)	19 May	NCDC Resource Center, Ilam

Appendix 2 – Documents

Ref	Author	Year	Title	Notes / links / language
1	Samling Power Company Ltd	2023	Company web site (Samling is the special-purpose vehicle for the Mai Beni HPP).	https://spcl.com.np/
2	Urja Developers	2023	Company web site (Urja is the parent group for Samling Power)	https://urjadevelopers.com/home/
3	Urja Developers	2022	Flow chart of the company's supply chain/procurement	
4	Urja/Samling	2022	Administration Policy and Procurement of Samling Power Co	
5	Urja	2021/22	Grievance Mechanism and Grievance record	
6	Samling Power Company Ltd	2023	Monitoring Report, January-June, 2023	
7	Samling Power Company Ltd	2020	Connection agreement	
8	Samling Power Company Ltd	2020	Annual General Meeting Report	
9	Samling Power Company Ltd	2020	Generation License	
10	Nepal Environment and Development Consultant Pvt. Ltd.	2019	Updated Initial Environmental Examination (UIEE) – Mai Beni Hydropower Project (9.51 MW), Ilam District	
11	Hagler Bailly Pakistan	2022	Rapid Environmental Flows Assessment	
12	USAID	2016	Fact Sheet - Strengthening Flood Resilience in Nepal's Kankai River Basin: E2E Early Warning System	
13	Government of Nepal	2020	Second Nationally Determined Contribution (NDC)	
14	Government of Nepal	2019	Climate Change Policy	
15	Government of Nepal	2021	National Adaptation Plan (NAP)	
16	Government of Nepal	2021	Green, Resilient, and Inclusive Development (GRID) approach	
17	World Bank	2022	Country Climate and Development Report - Nepal	

18	Hocky, R, Rasul, G. et. Al.	2019	High Mountain Areas; IPCC Special Report on the Ocean and Cryosphere in a Changing Climate	
19	Department of Hydrology and Meteorology (DHM)	2017	Observed Climate Trend Analysis in the Districts and Physiographic Zones of Nepal (1971-2014)	
20	Ministry of Forests and Environment (MoFE)	2019	Climate change scenarios for Nepal, National Adaptation Plan	
21	Samling Power Company	2023	GRM record for Mai Beni HPP	
22	Samling Power Company	2023	Sample grievance with photo support and resolution (damage from access road construction)	
23	Urja, Samling and Asian	2023	Code of Conduct for Powerhouse, Headworks and Staff Quarter	
24	Urja, Samling and Asian	2023	Fall protection policy	
25	Samling Power Company Ltd	2023	Sample of Tool Box Talk Form – safety review before work is started	
26	Samling Power Company Ltd	2023	Three sample weekly HSE-inspection reports, Mai Beni HPP	
27	Samling Power Company Ltd	2022	Audited Annual Report	
28	Urja Engineering	2022	Capacity Building Training on Community based Flood Early Warning System, report from an activity under the USAID-funded Tayar Nepal – Improved Disaster-risk Management Project	
29	Urja Engineering	2022	Awareness and Capacity Building Training Program on Landslide Risk Reduction at Maijogmai Rural Municipality, Ilam, report from an activity under the USAID-funded Tayar Nepal – Improved Disaster-risk Management Project	
30	Samling Power Company Ltd	2023	Meeting minutes of local community meeting on 8 June 2023 on GRM Awareness	
31	Samling Power Company Ltd and Asian	2021	Covid-19 support to affected communities and wards of Mai Beni Hydropower Project and Lower Jogmai Hydropower Project	
32	Samling Power Company Ltd and Asian	2023	CSR reporting (additional benefits extended to the local communities under the heading of CSR)	

33	Samling Power Company Ltd	2018	Samling Administration Policy, including Procurement Policy	
34	Samling Power Company Ltd	2023	Rating curve for the intake	
35	Urja with support from the IFC and the Tayar Program	2023	Emergency Response Plan	
36	Samling Power Company Ltd	2023	Seismic risk assessment (translated excerpt from Nepali original)	
37	Samling Power Company Ltd	2023	Policy for sudden shutdowns of the plant	
38	Samling Power Company Ltd	2023	Eflow monitoring Plan	
39	Nepal Government through its Parliament	2017	Intergovernmental Fiscal Arrangement on how to share the revenue from the “hydropower tax”.	
40	Urja	2022	Environmental and Social Policy Statement	
41	Urja	undated	Gender Based Violence and Harassment (GBVH) Policy and Protocol	
42	Samling	2018	Human Resources Policy	
43	Urja	2022	Occupational Health and Safety (OHS) Policy	
44	Nepal Government	2017	The Labour Act 2017 (2074)	
45	Samling Power Company Ltd	2023	Records of public-safety communication and awareness	
46	Nepal Development Research Institute (NDRI)	2017	Adaptation to Climate Change in the Hydro-electricity Sector in Nepal	
47	Beck et al.	2018	Present and future Köppen-Geiger Climate Classification Map	
48	Ministry of Ministry of Forests and Environment	2019	Environmental Impact Assessment Manual	
49	European Centre for Medium-Range Weather Forecasts (ECMWF)		ERA5-land, climate trends from 1950-present.	

50	Ministry of Forests and Environment (MoFE)	2018	Hydropower Environmental Impact Assessment Manual	
51	Wijngaard RR, Lutz AF, Nepal S, Khanal S, Pradhananga S, Shrestha AB, et al.	2017	Future changes in hydro-climatic extremes in the Upper Indus, Ganges, and Brahmaputra River Basins.	
52	Urja Engineering	2022	Disaster-Simulation Exercise – report from an activity under the USAID-funded Tayar Nepal – Improved Disaster-risk Management Project	
53	Hagler Bailley Pakistan	2022	Biodiversity Management Plan for Social and Biodiversity Assessment for MBHPP and LJKHPP	
54	Samling Power Company Ltd	2023	Stakeholder-engagement records, 2023	
55	Samling Power Company Ltd	2023	Revised and updated Human Resources Policy	
56	Samling Power Company Ltd	2023	Hydrological Resource Study, Mai Beni Hydroelectric Project	
57	Samling Power Company Ltd	2023	Climate Resilience and Risk Assessment	
58	Samling Power Company Ltd	2023	Hydrological Monitoring System for Mai Beni Hydroelectric Project	
59	Securities Board of Nepal	2017	Directives on Good Corporate Governance of a Body Corporate, 2074	
60	Asian Development Bank	2012	Climate Risk and Adaptation in the Electric Power Sector	https://www.adb.org/sites/default/files/publication/29889/climate-risks-adaptation-power-sector.pdf
61	Asian Development Bank	2014	Climate Risk Management in ADB Projects	https://www.adb.org/sites/default/files/publication/148796/climate-risk-management-adb-projects.pdf
62	Divas B. Basnyat and Paul Watkiss	2017	Adaptation to Climate Change in the Hydroelectricity Sector in Nepal.	https://cdkn.org/sites/default/files/files/hydroelectricity-in-Nepal-final-WEB.pdf

63	Khanal, Sonu	2021	Climate Risk Adaptation Assessment for Dudhkoshi HEP, Nepal.	https://www.futurewater.nl/wp-content/uploads/2023/04/2021013_CRVA_Nepal_Hydropower_revised_ADB.pdf
64	NPC	2011	Climate-Resilient Planning. [Working Document], Government of Nepal, National Planning Commission, Kathmandu, Nepal.	
65	Sharma, E; Chettri, N; Tse-ring, K; Shrestha, AB; Fang Jing; Mool, P; Eriksson, M	2009	Climate change impacts and vulnerability in the Eastern Himalayas. Kathmandu: ICIMOD	

Appendix 3 - Photographs



Photo 1: The Mai Beni HPP weir, intake and desander, with cremation-site shelter at centre-left.



Photo 2: Mai Beni HPP powerhouse staff buildings, penstock and surge shafts, from across the valley.

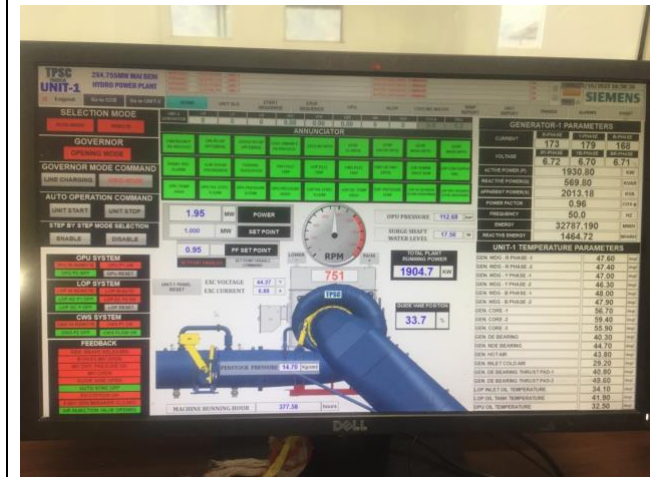


Photo 3: Scada monitoring system inside the Mai Beni powerhouse.



Photo 4: Typical view across Mai Khola Valley.



Photo 5: Ilam tea estate.



Photo 6: Waste separation at the Mai Beni plant entrance.



Photo 7: Septic tank installed by the project.



Photo 8: Fire-safety instructions at the Mai Beni switchyard.



Photo 9: Mai Beni Plant Deputy Manager and ESHS Officer at an Assembly Point with safety signage.



Photo 10: Fire extinguishers are found in several key locations around the plant.



Photo 11: Staff quarters at the Jogmai HPP, also for Mai Beni HPP staff.



Photo 12: Badminton court for Mai Beni staff, note severe bank erosion, caused by normal flood flows, in the background.



Photo 13: Safety signage for staff at the plant entrance.



Photo 14: The bank erosion at the Mai Beni intake, caused by the outlet from the upstream project.



Photo 15: The Mai Beni desander at the intake.



Photo 16: Erosion-control bio-engineering works at the Mai Beni surge shaft.



Photo 17: Ongoing bio-engineering works near the surge shaft.



Photo 18: The surge shaft and the bioengineering done there to control erosion.



Photo 19: Stall-fed cattle, Mai Khola Valley.



Photo 20: House of the Dahal's family – an economically-displaced family.



Photo 21: Covid-19 pandemic-relief programme implemented by project staff in the community.



Photo 22: Plaque, located at the main Mai Khola bridge, describing the work done on the disaster-risk management system.



Photo 23: Emergency Response System notice at the Ilam Municipality Office, Ilam.



Photo 24: Some emergency-response gear outside the Ilam Municipality Office, plus Deputy Mayor of the Municipality at left.



Photo 25: One of 5 rainfall gauges part of the catchment-wide flood-warning system installed.



Photo 26: Assembly point used during disaster-simulation exercise.



Photo 27: Community members saving a victim during disaster-simulation exercise.



Photo 28: Community members carrying a stretcher during disaster-simulation exercise.



Photo 29: Community members practicing first aid to victim during disaster-simulation exercise.



Photo 30: The emergency alarm can be triggered remotely by calling this device, located inside the powerhouse.



Photo 31: Resettlement residence - shed, residential house and improved toilet.



Photo 32: Electricity-connection box at the resettlement house.



Photo 33: The only resettlee, also an IP, of the Mai Beni HPP 2.



Photo 34: View across Mai Khola Valley from the resettlee's house.



Photo 35: The land title of the resettlee.

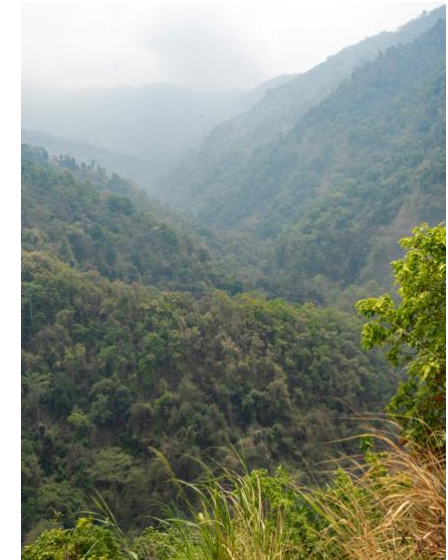


Photo 36: East side of Mai Khola Valley, with large areas of undisturbed forest.



Photo 37: Mai Beni intake weir, low slope with rocks breaking up the flow to facilitate fish migration.



Photo 38: Mai Pokhari RAMSAR site in the upper catchment of Mai Beni HPP.



Photo 39: Temple at the confluence of Mai Khola and Jogmai Khola, site of the annual Maghe Sankranti festival, usually held in January.



Photo 40: Safe cremation place built close to the Mai Beni headworks/intake as a community benefit.



Photo 41: Resting area with roofing and toilet at the cremation place built close to the Mai Beni headworks/intake as a community benefit.



Photo 42: Safe drinking water provided at the cremation place built as a community benefit.



Photo 43: Shelter for cremation attendees at the confluence of Mai Khola and Jogmai Khola.



Photo 44: Grievance box.



Photo 45: Community meeting at the Mai Beni-Jogmai guest house and staff quarters.



Photo 46: Namsaling Community Development Centre (NGO mainly for micro-hydro) Resource Centre, Ilam.



Photo 47: Urja's guest house by Jogmai HPP.



Photo 48: The very small intake pond of the Mai Beni HPP.



Photo 49: Water-level sensor at the main Mai Khola bridge (downstream of Mai Beni).



Photo 50: Mai Khola between Mai Beni's intake and outlet - minimum flow passing in the river.



Photo 51: Discharge gauge for monitoring of environmental -flow releases at the Mai Beni weir.



Photo 52: Mai Beni HPP's bay in the Godak substation control room.



Photo 53: Automatic record-keeping on generation at the substation.

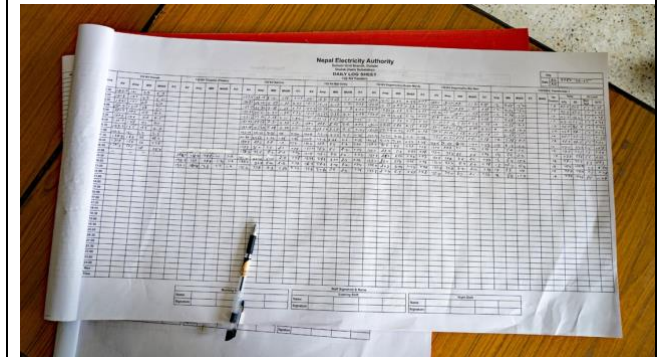


Photo 54: Manual record-keeping on generation at the substation.

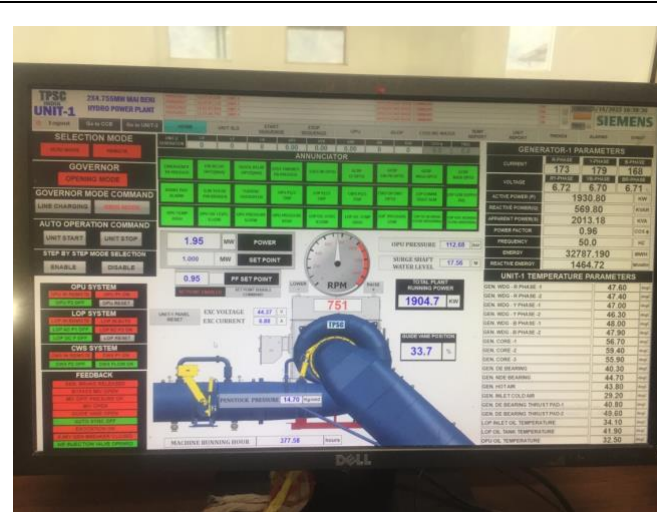


Photo 55: Scada monitoring system in the Mai Beni powerhouse.



Photo 56: Mai Beni HPP's outgoing 33-kV transmission line and the intake to the downstream-located cascade plant.



Photo 57: Mai Beni's incoming bay at the Godak substation.

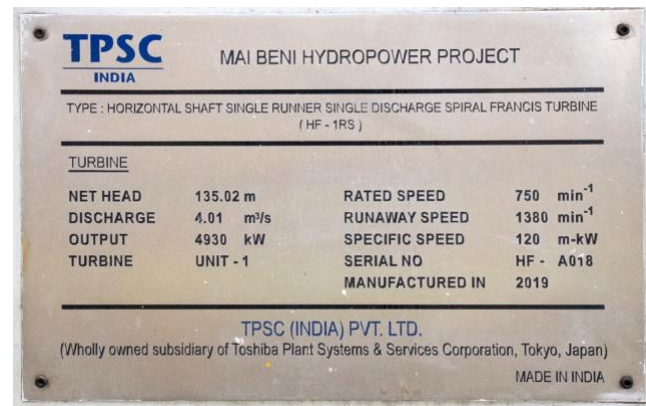


Photo 58: Turbine plate for Unit 1 at Mai Beni HPP powerhouse.



Photo 59: Mai Beni HPP powerhouse, machine hall.



Photo 60: A man producing gravel for construction works in the riverbed near Puwa HPP.