



MPATAMANGA HYDRO POWER PROJECT

ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT

SCOPING MEETINGS

November 2023



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Purpose of this Meeting and Project Description

Purpose of this Meeting

- 1 Present the Mpatamanga project components and the project delivery schedule
- 2 Scope the potential social and environmental impacts that are being studied in detail in 2023-24:
 - › Potential impacts identified to date
 - › Planned impact evaluation methods
 - › Public consultation programme
 - › Recommendations from you to improve consideration of potential environmental and social impacts



Context

1. Project developed by the Government of Malawi, EDF, SCATEC and IFC, who established a dedicated company: MHPL
2. Financed by the World Bank Group and International Financing Institutions
3. Several technical, environmental and social studies undertaken since 2020; delayed by COVID-19
4. In 2023-2024, MHPL will finalize:
 - Detailed **engineering** studies to design all facilities and specify the works
 - Detailed **environmental and social** studies to predict the effects on communities, businesses and ecology and define the mitigation strategy
5. This presentation is being made by the MHPL Environmental and Social Team

Need for the Project

Objective: Increase hydropower generation capacity in Malawi

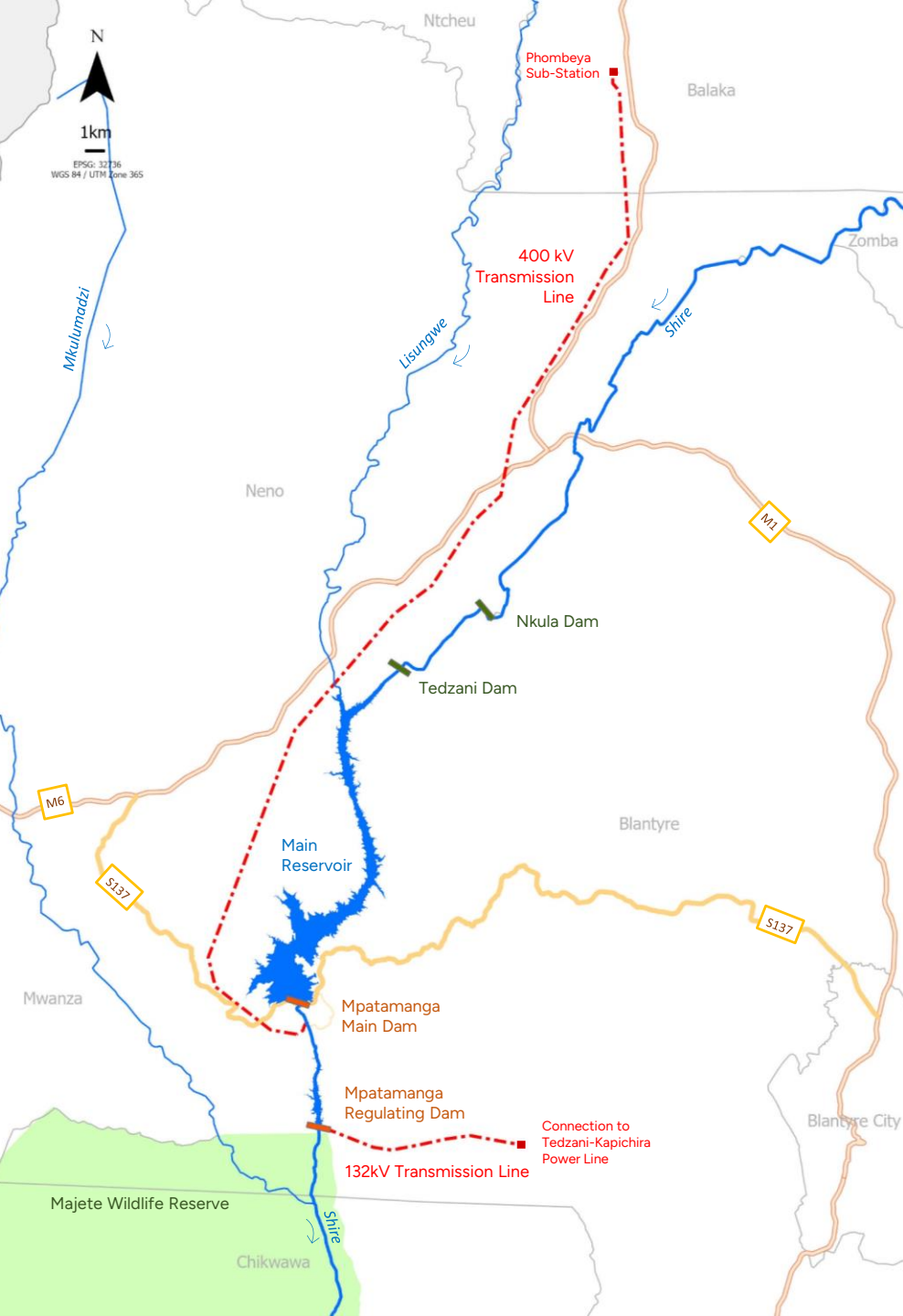
Mpatamanga Project will:

- Double the national hydroelectricity generation capacity
- Reduce energy shortages and enhance energy security
- Enable further introduction of solar photo voltaic electricity in Malawi, balancing its intermittency

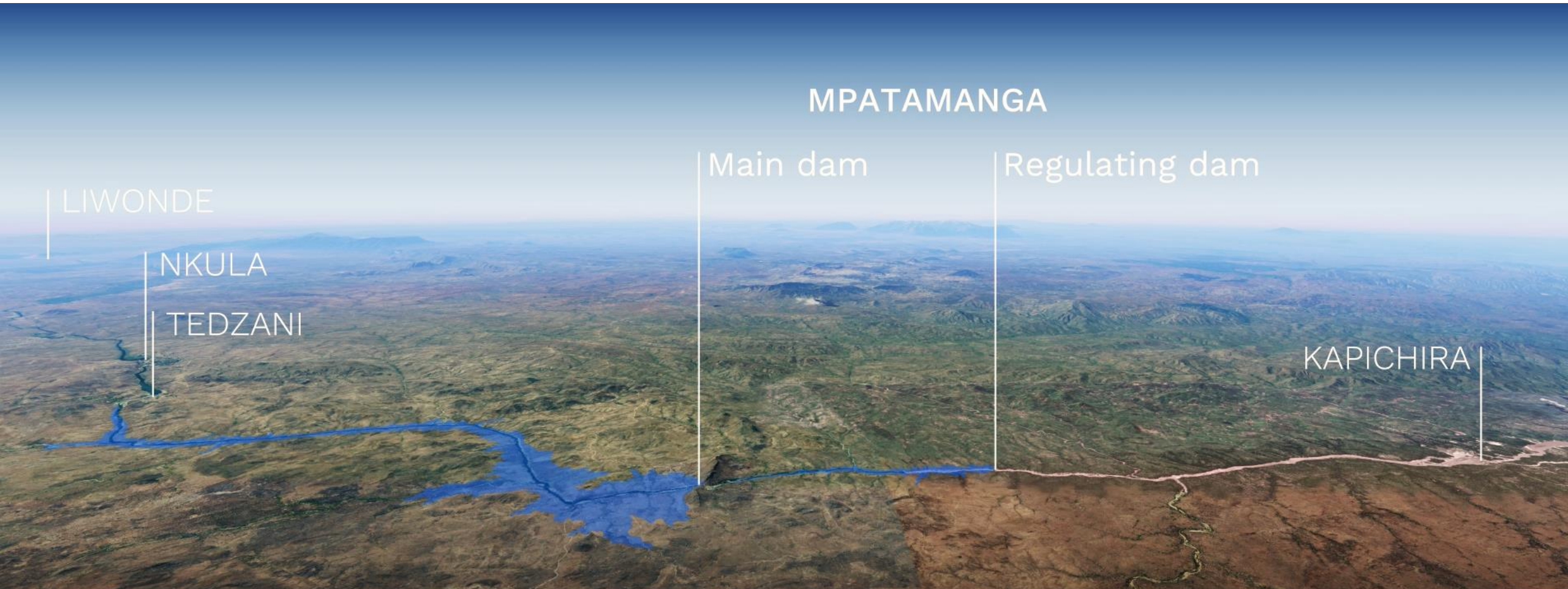


Main Features

1. Hydropower scheme comprising two dams, with associated reservoirs and powerhouses
2. Two Transmission Lines to transport the electricity generated at the powerhouses to the grid
3. Upgrade of S137 road on Blantyre side and new road between the main dam and the regulating dam



Mpatamanga facilities will be between existing Tedzani and Kapichira hydropower schemes



Permanent Facilities – Dams and Reservoirs

Dam n°1 = Mpatamanga Main Dam

- 50 m high concrete dam creating a 19 km² storage reservoir area (x 15 Kapichira)
- 309 MW Powerhouse located 1km downstream of the dam
- Generation of ~1,209 GWh of clean energy per year
- Reservoir operated with hydropeaking: filling up during off-peak hours and producing power during peak hours
- One permanent operators' village for the operation phase

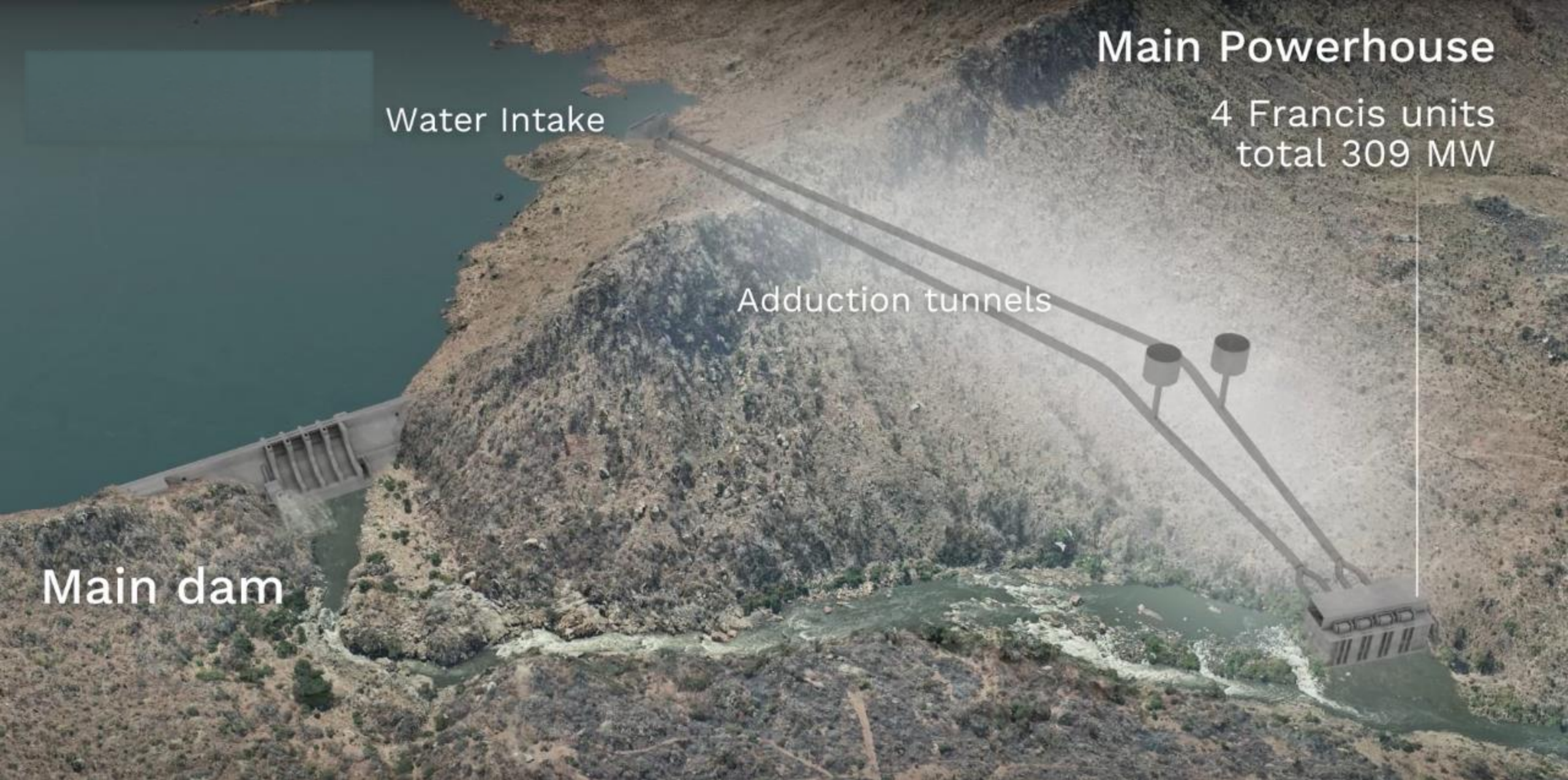


Main dam



Nakai Dam in Laos

Similar size
and design to
the proposed
Mpatamanga
Main Dam



Main Powerhouse

4 Francis units
total 309 MW

Water Intake

Adduction tunnels

Main dam

Permanent Facilities – Dams and Reservoirs

Dam n°2 = Mpatamanga Regulating Dam:

- › Compensate sudden variations of water flow released by the main powerhouse, and restore the natural river flow downstream of Mpatamanga
- › 35-meter-high dam creating a 1.5km² reservoir area (~ Kapichira)
- › Significant sub-daily variations of reservoir water level (\pm 8.5m vertical)
- › 52 MW powerhouse at the foot of the dam, generating 295 GWh of clean energy per year



Regulating dam



Source: <https://hobomaps.com/NamOu4daminfo.html>

Nam Ou 4 Dam in Laos

Similar size to the proposed Mpatamanga **Regulating** Dam

Mpatamanga
hydropower plant
is a peaking scheme



Main dam

Regulating dam

Reservoir capacity
260 hm³

Main Reservoir Inflow = Regulating Reservoir Outflow
except during reservoir filling



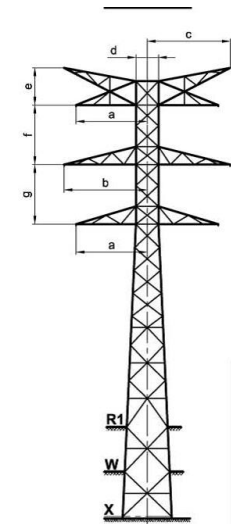
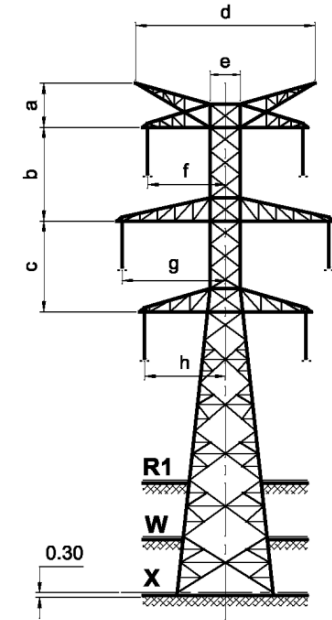
Permanent Facilities – Transmission Lines

400 kV Transmission Line:

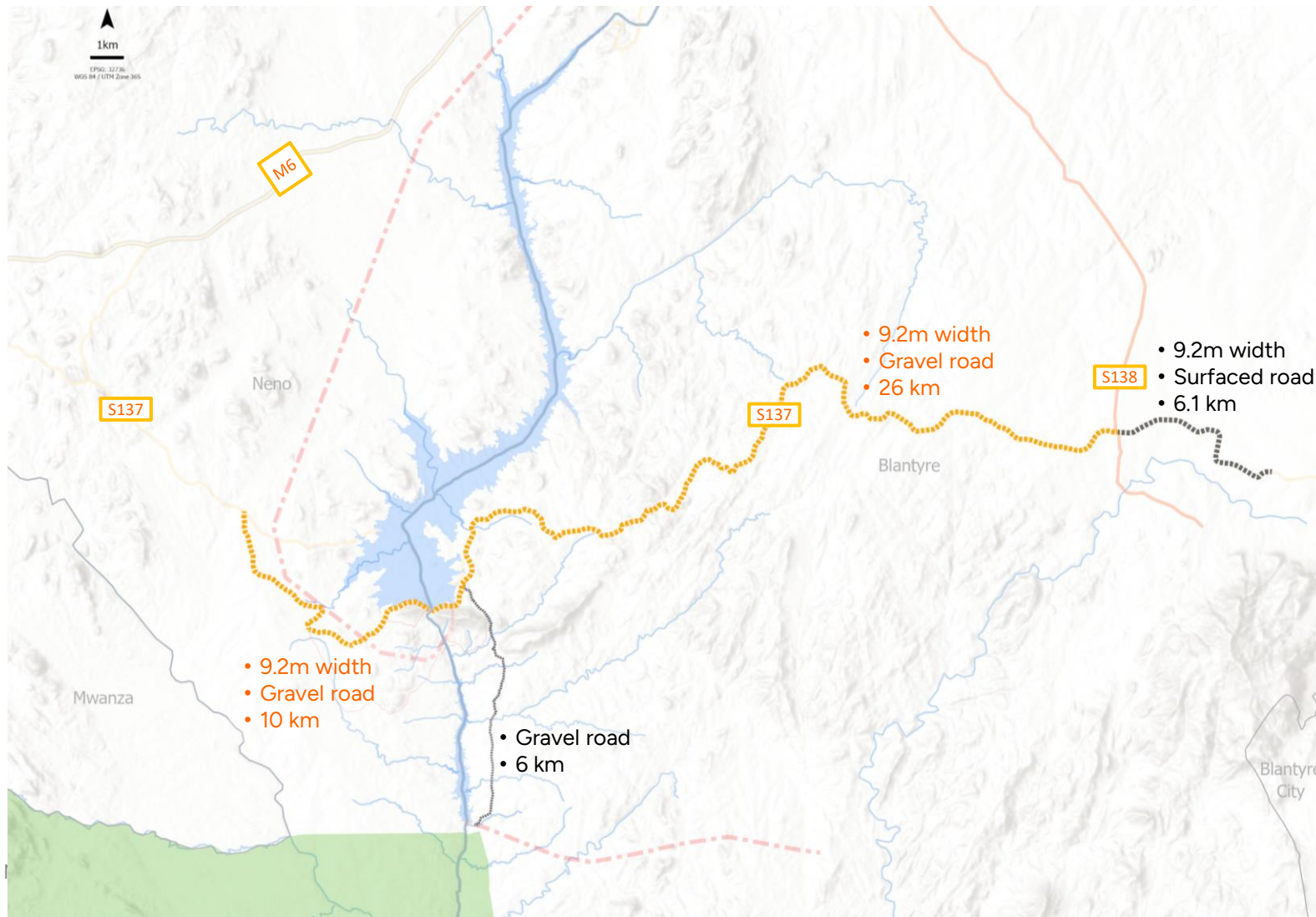
- 64km long, from main dam to existing Phombeya sub-station
- Each tower is 50m high, typically spaced every 500 meters
- 55 m wide right of way

132 kV Transmission line:

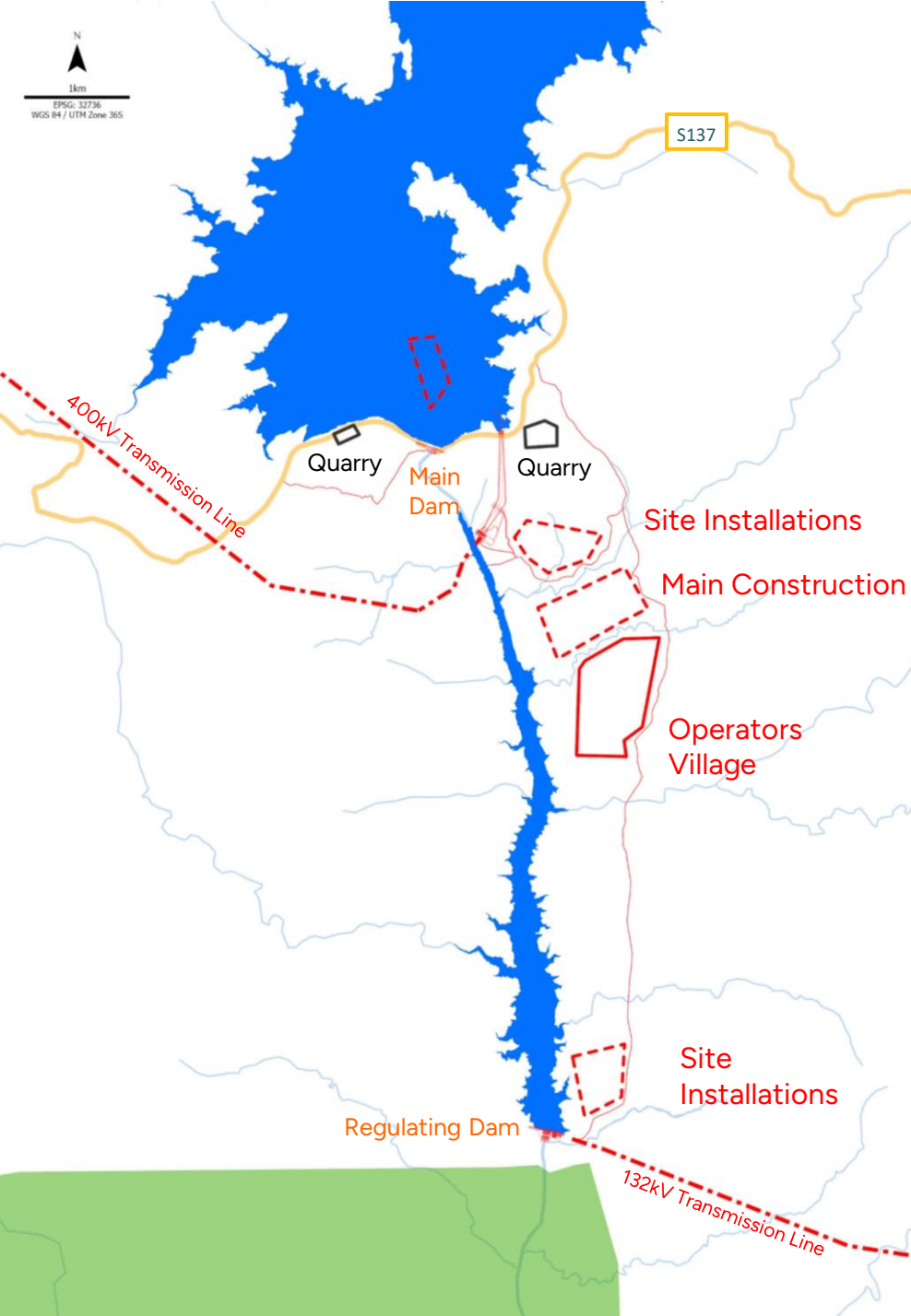
- 11-km long, from the regulation dam to existing Tedzani-Kapichira Transmission Line
- Each tower is 30m high, typically spaced every 300 to 500 meters
- 35m-wide right of way



Permanent Facilities – S137 Road Upgrade from Chileka Airport to Mpatamanga



Construction Facilities



- Main Dam Site:
 - › Site installations (dam, powerhouse, switchyard)
 - › Main Construction camp (~2,500 workers)
 - › Quarry Areas
- Regulating Dam Site:
 - › Site installations only, no camps, no quarry
- Transmission Lines:
 - › Fly camps and temporary construction compounds at intervals along the T-line
 - › Access tracks

Key Dates

- 2024 - Preparation:
 - › Detailed technical, environmental and social studies
 - › Selection of construction companies

- 2025 to 2029: Construction
 - › S137 road upgrade in 2025
 - › Main construction works from 2026 to 2029

- 2030 onwards Operation
 - › Start of power generation at the two powerhouses
 - › To be operated by MHPL for 30 years, then transferred to the Government

2024 ESIA Process

1. Q2-Q3 2023: **Baseline** field investigations and meetings with key stakeholders
2. Q4 2023: Coordination with engineering teams, to understand changes caused by the Project and to minimise environmental and social impacts
3. Q1-Q2 2024: Prediction of environmental and social impacts, definition of mitigation measures, writing of the draft ESIA report
4. Q3 2024:
 - Public consultations on ESIA findings
 - ESIA Submission to MEPA (permitting) and to the Lenders (Appraisal)
 - Finalization of ESIA considering feedback from communities, MEPA, NGOs, Lenders

2

Potential Social and Environmental Impacts

Main Issues that will be Studied in Detail in 2023-2024

1. Physical displacement, Loss of Land and Access to Land
2. Reservoir Sediment Trapping and Downstream Erosion
3. Hydrology and Water Quality
4. Influx: Project-Induced In-Migration
5. Air, Noise, and Light Pollution
6. Community Health and Safety
7. Labour Working Conditions and Supply Chain
8. Loss of Aquatic and Terrestrial Habitats

Physical displacement, Loss of Land and Access to Land

- The Mpatamanga project needs to permanently acquire approximately 39 km² of land for the reservoirs, transmission lines, dams, operators' village, S137 upgrade and access roads
- Initial estimates show that fewer than 200 households may need to be physically displaced along with 5 cattle ranches, 2 schools, 5 graveyards and some business premises. These numbers will be reviewed and confirmed in 2024
- Livelihoods will be impacted including loss of agricultural land for subsistence, illegal charcoal making and potentially small businesses
- Gravesites will also be impacted and need to be relocated in consultation with affected people
- Opportunistic land purchases are also a risk

Reservoir Sediment Trapping and Downstream Erosion

- Most of the sand and suspended solid transported by the Shire River will be trapped in the Mpatamanga main reservoir
- Downstream of the Mpatamanga regulating dam, the Shire River could be exposed to erosion down to the confluence with the Mwanza River
- This, in turn, could affect river aquatic habitats, riparian vegetation, farming and irrigation water intakes located along the river banks
- Nutrients associated with sediments may also be trapped in the main reservoir, causing a reduction in nutrient delivery to floodplains in the lower Shire River, potentially affecting aquatic life or floodplain soil fertility
- Potential transboundary effects if the area of downstream influence extends beyond the border with Malawi

Hydrology and Water Quality

- Changes in the current river flow regime downstream of the dams during reservoir filling
- Raised groundwater levels around the proposed reservoirs and risk of water logging in the vicinity of the future reservoir boundaries and implications for productive farmland or water wells
- Altered water quality in the main reservoir and the downstream Shire River for the first years of operation, with potential effects on aquatic ecology and water users
- During construction, risk of river pollution from (i) increased runoff and sedimentation of water bodies due to soil excavations, disturbance and erosion, or (ii) water resources contamination from accidental spills of hazardous products or poor waste management



Influx - Project-Induced In-Migration

- **Construction activities** will attract job seekers coming from Blantyre and farther. Associated potential risks include increased:
 - › Tensions between workers and the community
 - › Sexual harassment against community members notably women
 - › Disease transmission in the community
 - › Inflation and food insecurity
 - › Illegal charcoal making, fishing, slash-and-burn agriculture, animal poaching
 - › Pressure on existing social services (health centres and schools)
- The **improved access** to the Regulating Dam and the 132kV Transmission Line could expose the Majete Reserve to additional pressures (e.g. poaching, charcoal)
- **During operation**, the main reservoir could attract **fishers** from other parts of Malawi, creating tensions with local communities

Air, Noise and Light Pollution

- During construction, blasting, drilling, earthworks and truck traffic can cause vibrations, dust emissions and noise, which can affect local communities
- During construction and operation, lighting of the dam sites will be provided for workers and traffic safety reasons using powerful spotlights
- Dust, noise, vibrations and light pollution may have public health implications for adjacent villagers. It could also affect the local wildlife and reduce the attractivity of the tourist lodges close to the proposed Mpatamanga regulating dam.



Community Health and Safety Risks

- During construction, the influx of job seekers may alter social cohesion and impact community health. Additional health risks may result from the presence of a large Project workforce, e.g. disease transmission in the community, violence, sexual harassment
- During construction and operation, traffic and road accidents involving local people or workers may increase due to improved S137 road access
- During operation:
 - › Presence of the main reservoir may increase water-borne diseases
 - › Sub-daily sudden increases in the regulating reservoir water level will represent a hydraulic safety hazard for people along the shore
 - › As for any large dam, there is a very unlikely risk of dam break and associated downstream flooding

Labour Working Conditions and Supply chain

- Job opportunities:
 - ~ Around 2,500 positions at peak period during construction. Local villagers may benefit from a proportion of these opportunities, dependent on skills needs and availability
 - ~ Around 80 employees during the operation phase, mostly skilled positions
- During construction, potential risks with working conditions of casual workers and workers of subcontractors of the main construction companies:
 - › e.g. lack of contract, unfair pay, extended working hours, payment not on time, injuries at work



Loss of Aquatic and Terrestrial Habitats

- Loss of about 36 km of river aquatic ecosystems and habitat due to the creation of the reservoirs
- Loss of vegetation and habitat for native fauna, including aquatic and riparian fauna dependent on river habitats (hippos, crocodiles, river turtles, water birds)
- Potential downstream impacts on aquatic habitats of threatened species and fisheries
- Risk of colonization of exotic species (fish, aquatic weeds) in the reservoir that could affect freshwater species of the Shire River
- Bird collision and electrocution risks with transmission lines



3

Impact Assessment Methodology

Establishing the Baseline Situation

1. **Social surveys** to map the location of households and economic operators affected by the Project and understand vulnerability to changes caused by the Project
2. **Ecological inventories** to identify terrestrial and aquatic fauna, flora and habitats that will be affected by either the project footprint or operations
3. **Sampling** of soil, water, and sediment to characterise current quality, measurement of ambient noise.
4. Interpretation of recent **high-resolution orthophotos** of the entire project footprint and the Shire River banks downstream of the dams



Predicting the Changes and Consequences on Communities, Operators and Ecology

1. Applicable standards are the Malawian regulation and multilateral framework, as well as the World Bank and IFC Environmental and Social Policies and Standards
2. Modelling to predict future situations: hydrology and hydraulics, erosion, climate change, water quality, air and noise
3. Specialists assessment, using modelling outcomes, expert judgment, interpretation of spatial information, comparison with similar projects in Malawi or other countries
4. Review of conclusions by independent national and international experts

Public Consultation Meetings

1. A first round of stakeholder meetings will be organized before the draft ESIA reports are disclosed to discuss the findings of the impact assessment and the relevance of proposed mitigation measures
2. The draft ESIA documentation will be publicly disclosed online and in hardcopies in various locations for 4 months
3. A second round of stakeholder meetings will be organised during the public disclosure period
4. The Project's ESIA and associated mitigation strategy will be adjusted to take into account feedback collected during public disclosure



4

Questions & Answers



THANK YOU