

**HPNET**  
HYDRO EMPOWERMENT NETWORK

# CIRCULARITY IN HYDRO MINI-GRIDS

**ACCELERATING CLIMATE AND ECONOMIC RESILIENT ENERGY ACCESS**

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*Sustainable Water and Energy Solutions supporting Circular Economies Workshop*  
United Nations Water and Energy Network  
Madrid, Spain  
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**HPNET**  
HYDRO EMPOWERMENT NETWORK

**South-South Knowledge Exchange & Advocacy**

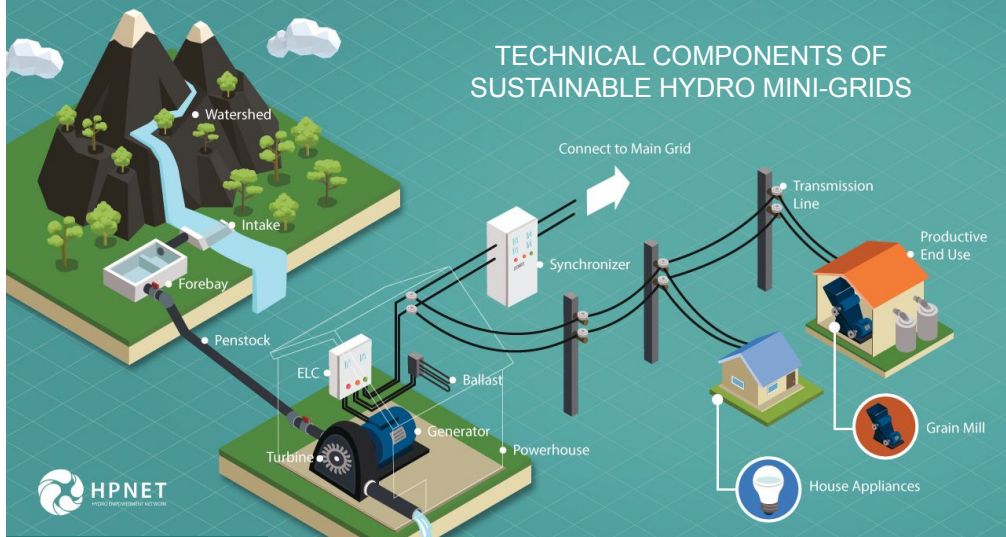
Climate resilient **water-energy-food-forests-livelihoods** nexus

- Energy access → electric cooking, agri-processing, clinics
- Locally-manufactured & -owned → inclusive development
- Incentivized eco-restoration → multi-use access to water

Accelerating **local social enterprise development**

- STEM learning → hydrology, civil design, electro-mechanical

• **SE-ED** Social Enterprise for Energy, Ecological and Economic Development



Mae Muk Waterfall Mini Hydro, Shan State, Myanmar. Credit: D. Vagheia

Simli Khola Micro Hydro, Nepal. Credit: AEPG-RERI

Curugmuncar Micro Hydro Village, Pekalongan Regency, Central Java, Indonesia. Credit: Asosiasi Hidro Bandung

**2013 - 2022**

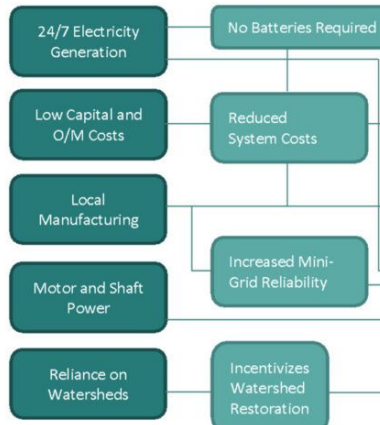
200+ multi-actor members globally

70+ learning events for Southern actors

30+ project implementation partnerships

9 thematic workstreams

**CHARACTERISTICS**



**BENEFITS**





Social Enterprise for  
Energy, Ecological and  
Economic Development



**THEMATIC ELEMENTS**

**2023 - 2028:  
GOALS AND FUNDING NEEDS**



**ASIA PACIFIC**

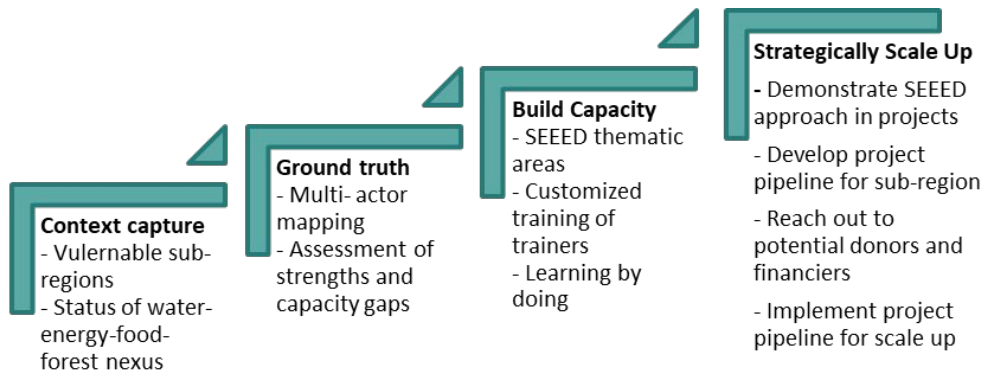
- Integrate **watershed restoration** into existing projects
- Transition from **grant-dependent** to **social enterprise** approaches

**LATIN AMERICA**

- Enable **access-to-finance** for enterprise-based approaches
- Facilitate **intra-regional exchange** for last mile energy access

**SUB-SAHARAN AFRICA**

- **Demonstrate** financial **viability** of community-scale hydropower
- Conduct **Asia-Africa knowledge exchange** for civil society, entrepreneurs, government, funders, & associations



**Context capture**

- Vulnerable sub-regions
- Status of water-energy-food-forest nexus

**Ground truth**

- Multi-actor mapping
- Assessment of strengths and capacity gaps

**Build Capacity**

- SEED thematic areas
- Customized training of trainers
- Learning by doing

**Strategically Scale Up**

- Demonstrate SEED approach in projects
- Develop project pipeline for sub-region
- Reach out to potential donors and financiers
- Implement project pipeline for scale up

**IMPACT STRATEGY**

# CIRCULARITY IN HYDRO MINI-GRIDS: OPPORTUNITIES



## LOCAL MANUFACTURING

 Re-use & Recycling of Metal Parts

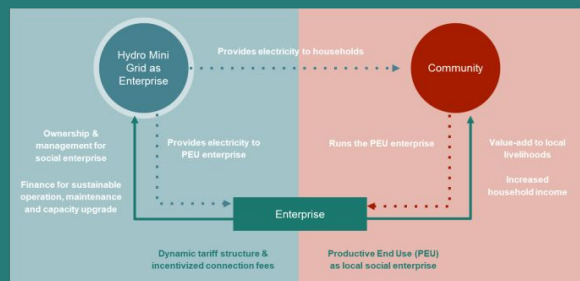
- Pelton Buckets
- Induction generators
- Transmission / distribution
- Metal penstock

→ LOWER COSTS  
→ LOCAL SKILLS / JOBS



## MOTORIZED END USE


 Socio-economic Circularity

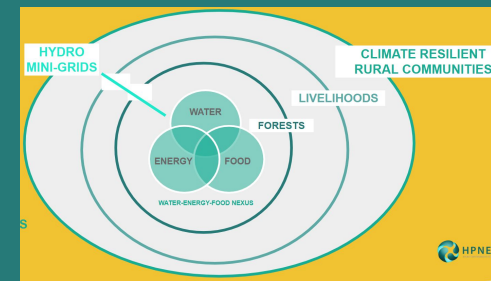


→ FINANCIAL VIABILITY



## CATCHMENT RESTORATION

 Eco-system Circularity



→ CLIMATE RESILIENCE

# SCALING UP FOR 2030 UNIVERSAL ACCESS

## CHALLENGES

- Mini-grids synonymous to PV-battery – Lack of technology differentiation
- Financiers require scaleable project pipelines for implementation – Lack of feasibility study, local capacity building / mentorship, and aggregation of viable projects
- Multi-thematic resource mapping – Lack of identifying low hanging fruit, i.e. sub-regions with appropriate hydro resource, local capacities, and agri end use

## SOLUTIONS

- INCLUSION OF LOCAL-MOST PRACTITIONERS → SUSTAINABILITY & ACCELERATION
- COUNTRY-SPECIFIC STRATEGIES AND MAPPING → PROJECT PIPELINE DEVELOPMENT
- COALITION-BUILDING OF FUNDERS AND POLICYMAKERS → TRANSITIONAL FINANCE