

COMMUNITY ENGAGEMENT AND EMPOWERMENT THROUGH ACCESS TO SOLAR ENERGY INITIATIVE

Burum District, FCT Abuja, Nigeria

PROJECT REFERENCE	FOCAL AREA	STRATEGIC INITIATIVE	STATUS
GEF-SGP/NIG/OP7/2024	Climate Change Mitigation & Adaptation	OP7 – Community-Based Natural Resources Mgmt.	Active / Implementation Phase
EXECUTING AGENCY	IMPLEMENTING AGENCY	PROJECT DURATION	LOCATION
ESWAYDI	UNDP Nigeria / GEF SGP National Coordinator	12 Months	Takushara, Sauka & Burum Communities, Burum District, FCT

PROJECT AT A GLANCE — KEY FIGURES

30 kW Total Solar Mini-Grid Capacity	3 Communities Directly Benefiting	~2,500+ Estimated Beneficiaries
8+8 Smart Public Toilet Cubicles	1,920W Borehole Solar Array Capacity	~70 tCO₂ Est. Annual GHG Reduction

1. PROJECT BACKGROUND & CONTEXT

Burum District, located in the Federal Capital Territory (FCT) of Abuja, Nigeria, comprises several rural and peri-urban communities — including Takushara, Sauka, and Burum — that have long suffered from limited or non-existent access to reliable electricity, clean water, and basic sanitation infrastructure. In alignment with the GEF Small Grants Programme (SGP) Operational Phase 7 (OP7) priorities —this project deploys an integrated package of solar energy infrastructure directly responding to community-identified priorities. The project covers four inter-linked sub-components: (i) Construction of a Smart Public Toilet facility in Takushara (4 female + 4 male cubicles); (ii) Drilling and installation of a solar-powered borehole using 6 units of 320W solar panels in Takushara; (iii) Construction and installation of a 10kW solar mini-grid in Sauka; and (iv) Construction and installation of a 20kW solar mini-grid in Burum village. These interventions are designed to be community-owned, operated, and maintained.

2. KEY OBJECTIVES

1	Provide reliable, affordable, and clean solar-powered electricity to households, small businesses, and community institutions in Sauka (10kW) and Burum (20kW) through community-managed mini-grids.
2	Ensure sustainable access to clean potable water through a solar-powered borehole in Takushara equipped with six (6) units of 320-watt solar panels, reducing dependence on polluted open water sources.
3	Improve public hygiene, sanitation, and women's safety through the construction of a gender-responsive Smart Public Toilet facility (8 cubicles) in Takushara village..

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| 4 | Reduce greenhouse gas (GHG) emissions by displacing diesel generators and kerosene/candle lighting with clean solar energy across all three communities. |
| 5 | Empower local communities / build local technical and organizational capacity for operation, maintenance, and financial management of community energy and water assets — especially women and youth — through skills transfer, livelihood creation, and participatory governance of community energy and water assets.

Demonstrate scalable and replicable low-carbon models for rural energy and WASH service delivery in line with Nigeria's NDC and Sustainable Development Goals (SDGs). |
| 6 | Strengthen community resilience to climate change impacts by ensuring energy and water security in an increasingly variable climate context. |

3. KEY ACTIVITIES AND INNOVATIONS

SUB-COMPONENT A: Smart Public Toilet Facility — Takushara Village

Activities

- Site assessment, soil testing, and architectural/engineering design of gender-segregated 8-cubicle facility
- Construction of permanent block structure with 4 female and 4 male cubicles, reception/management room
- Installation of solar-powered lighting (LED), ventilation, and automated sensor-based water flushing systems
- Connection to solar-powered borehole for water supply to the facility
- Community orientation and handover to women-led management committee
- Training of local custodians and fee collection agents

Innovations

- Smart sensor-based automated flush system powered entirely by solar energy — no grid dependency
- Solar LED lighting ensuring night-time safety, particularly for women and girls
- Integrated revenue-generation model: nominal user fee sustains O&M cost
- Gender-responsive design (separate, lockable cubicles with dignity considerations for menstrual hygiene)
- Digital usage tracking panel for community management committee

SUB-COMPONENT B: Solar-Powered Borehole — Takushara Village

Activities

- Hydrogeological survey and drilling of borehole to suitable aquifer depth
- Installation of submersible solar pump connected to 6 × 320W (1,920W total) solar panel array
- Construction of elevated water storage tank and community tap-stand distribution points
- Installation of metered water kiosks and automated pump controller
- Training of community water committee on

Innovations

- High-efficiency 320W monocrystalline panels enabling maximum output in sub-Saharan irradiation conditions
- Automated pump controller with remote monitoring capability for performance optimization
- Dual-use solar array: excess capacity supports Smart Toilet lighting and community phone charging station
- Pay-as-you-fetch metered kiosk model

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- O&M, water quality testing, and financial record-keeping
- Water quality testing and certification prior to commissioning

ensuring equitable access and financial sustainability

- Community-owned and managed water enterprise model with transparent governance

SUB-COMPONENT C: 10kW Solar Mini-Grid — Sauka Village

Activities

- Community energy needs assessment, load profiling, and demand survey in Sauka
- Design, procurement, and installation of 10kW solar PV mini-grid system with battery storage
- Installation of distribution network (low-voltage lines, meters, and household connections)
- Formation and training of Community Energy Enterprise (CEE) for tariff collection and maintenance
- Commissioning, system testing, and handover ceremony
- Establishment of mini-grid operations manual, maintenance schedule, and emergency protocols

Innovations

- Prepaid smart meters enabling real-time consumption tracking and automated tariff collection via mobile money
- Tiered tariff structure: lifeline rate for poorest households, commercial rate for enterprises
- Remote system monitoring dashboard accessible to community energy committee and SGP focal point
- Surplus energy time-of-day pricing to incentivize productive daytime use (milling, charging, sewing)
- Women's micro-enterprise energy access component: priority connections for women-owned businesses

SUB-COMPONENT D: 20kW Solar Mini-Grid — Burum Village

Activities

- Community consultations, energy demand mapping, and beneficiary registration in Burum
- Design and installation of 20kW solar PV mini-grid with deep-cycle battery bank and inverter system
- Extension of distribution lines to households, schools, health post, and market stalls
- Training of locally recruited mini-grid technicians (with preference for youth and women)
- Establishment of Community Energy Fund (CEF) for reinvestment and system expansion
- Integration with District-level Energy Access Coordination Mechanism

Innovations

- Scalable architecture: system designed for modular expansion to 30kW as community grows
- Hybrid mini-grid design compatible with future grid interconnection when national grid reaches area
- Community productive use of energy (PUE) hubs: dedicated circuits for agro-processing and refrigeration
- Integrated solar streetlighting along main community pathways
- Digital community energy dashboard displayed in public space for transparency and community awareness

4. COMMUNITY ENGAGEMENT STRATEGY

The project adopts a participatory, community-first approach fully aligned with GEF SGP's core principle that local communities are the primary stewards of environmental and social change. The engagement strategy spans the full project cycle — from design through implementation, monitoring, and handover.

Engagement Phase	Key Actions & Mechanisms
Pre-Project: Community Mobilisation	Traditional ruler and community elder consultations; Town Hall meetings in Takushara, Sauka, and Burum; Gender-disaggregated focus group discussions (FGDs) to identify women's and youth priorities; Community Needs Assessment (CNA); Participatory baseline surveys (energy access, WASH, livelihoods); Free, Prior and Informed Consent (FPIC) processes; Community co-investment commitment (land provision, local labour contribution).
Design & Planning	Community-led site selection committees for borehole, mini-grids, and toilet facility; Community design input sessions — ensuring culturally appropriate gender-sensitive facility design; Formation of Project Steering Committees (PSCs) in each village with women comprising minimum 40% membership; Participatory mapping of energy demand and distribution network routes.
Implementation	Community Labour Corps: prioritised local employment for construction, installation, and logistics (targeting youth unemployment); Regular community progress reviews — monthly in-village meetings; Transparent public notice boards displaying project expenditure, timelines, and milestones; Women's construction skills training component embedded in borehole and toilet construction phase.
Capacity Building & Training	Technical O&M training for 3 locally recruited mini-grid technicians and 2 borehole pump operators; Financial literacy and enterprise management training for Community Energy Enterprise (CEE) and Water Committee members; Community environmental education sessions on climate change, energy conservation, and WASH; Training of Trainers (ToT) model ensuring skills cascade within communities.
Governance & Ownership	Legal registration of Community Energy Enterprise (CEE) and Water Management Committee as formal entities; Development of Community By-Laws governing asset use, tariff setting, and conflict resolution; Establishment of segregated Community Energy Fund (CEF) bank accounts with dual-signatory governance; Annual community general assemblies (AGMs) for financial review and planning.
Post-Project Sustainability	12-month post-completion monitoring with quarterly site visits; Peer learning exchange visits to SGP-funded mini-grid projects in other states; Integration with FCT REA (Rural Electrification Agency) community energy platform for technical backstopping; Documentation and dissemination of community success stories through SGP national knowledge platform.

5. ENVIRONMENTAL & CLIMATE CHANGE ACHIEVEMENTS

The project contributes substantively to multiple GEF focal areas, particularly Climate Change Mitigation, Land Degradation, and International Waters, through the following measurable environmental and climate outcomes:

Achievement / Indicator	Target / Quantity	GEF/SDG Alignment
GHG Emission Reduction from electricity access	~70 tCO ₂ e/year (direct); ~350 tCO ₂ e over 5 yrs	GEF CC Mitigation; SDG 13

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Operational Phase

Renewable energy installed capacity	30 kW solar PV (mini-grids) + 1.92 kW borehole array = 31.92 kW total	GEF CC; SDG 7
Displacement of fossil fuel use (kerosene, diesel generators)	Est. 15,000+ litres of kerosene/diesel displaced annually	SDG 7, 13
Reduced wood fuel consumption (cooking/lighting substitution)	Indirect reduction through solar access, reducing reliance on biomass lighting	GEF LD; SDG 15
Access to clean water — reduction of waterborne disease burden	~500+ HHs with safe water access from solar borehole	GEF IW; SDG 6
Improved sanitation coverage — open defecation reduction	Elimination of open defecation for ~2,000+ persons in Takushara	SDG 3, 6
Productive use of clean energy (income generation)	Estimated 30+ micro-enterprises enabled by mini-grid electricity	SDG 8, 1
Energy access for school and health facility	Health post and primary school in Burum connected to 20kW mini-grid	SDG 3, 4
Women's empowerment and safety through solar lighting	100% solar-lit public toilet; solar streetlights along key pathways	SDG 5, 11
Local green jobs created	Minimum 15 direct jobs (technicians, operators, construction) — 40% women target	SDG 8

ALIGNMENT WITH GLOBAL & NATIONAL FRAMEWORKS

Framework	Linkage
SDGs	SDG 1 (No Poverty), SDG 3 (Good Health), SDG 5 (Gender Equality), SDG 6 (Clean Water), SDG 7 (Affordable & Clean Energy), SDG 11 (Sustainable Communities), SDG 13 (Climate Action)
Nigeria NDC	Supports NDC target of 20% unconditional GHG reduction; Off-Grid Solar Action Plan; National Renewable Energy & Efficiency Policy (NREEP)
GEF-8 Strategy	Focal Area: Climate Change Mitigation — Promoting clean energy access; integrated WASH and land degradation co-benefits
UNDP Strategic Plan	Signature Solution 4: Clean Energy & Climate Action; Signature Solution 6: Governance
FCT Master Plan	Aligned with FCT Rural Infrastructure Development Programme and FCT Solar Rural Electrification Strategy

Sendai Framework

DRR Component: energy and water resilience reduces disaster risk from climate shocks in rural communities

OUTCOMES & INDICATORS

Outcome	Indicator	Target
Increased energy access	No. of HHs connected to mini-grid	30+ HHs
GHG emission reduction	tCO ₂ e/year avoided	50–80 tCO₂e/yr
Clean water access	No. of people with access to safe water	≥2,500 persons
Improved sanitation	No. using smart toilet facility/day	≥200 persons/day
Livelihood improvement	No. of productive use businesses enabled by solar	≥20 MSMEs
Women empowerment	% women in CEWMC leadership	≥50%
Local employment	No. of jobs created (direct)	≥15 FTE during construction; 4 permanent O&M
Capacity building	No. of local technicians trained	6–8 certified technicians
GHG over lifetime	Total tCO ₂ e over 20-year project life	1,000–1,600 tCO₂e

KEY RISKS & MITIGATION MEASURES

Risk	Level	Impact	Mitigation
Equipment theft/vandalism	Medium	Disruption of energy/water supply	Community watchman scheme; fencing; asset insurance
Low tariff collection / non-payment	Medium	Financial unsustainability of O&M fund	Pre-paid smart metering; social mobilisation; graduated tariffs
Community governance conflict	Low–Medium	Management breakdown; asset neglect	Dispute resolution protocols in CEWMC constitution; SGP backstop support
Seasonal variation in solar irradiance	Low	Reduced generation in dry/hazy season (harmattan)	Battery storage sized for 2 days autonomy; load management protocols
Borehole yield underperformance	Low–Medium	Reduced water access	Geophysical survey prior to drilling; contingency borehole siting identified
Regulatory/policy changes	Low	Tariff regulation changes	Liaison with NERC and REA; MoU with FCT government

6. PARTNERSHIP & STAKEHOLDER COORDINATION

The project leverages a multi-stakeholder partnership architecture to maximise impact, ensure technical quality, and embed sustainability. The partnership framework spans government, civil society, private sector, and development partners.

Partner	Type	Role & Contribution
UNDP Nigeria / GEF SGP National Coordinator	Multilateral Development	Grant management, technical oversight, monitoring & evaluation, national knowledge sharing, SGP country programme coordination
Burum District Traditional Council	Traditional/Community Authority	Community mobilization, conflict resolution, land rights facilitation, community governance legitimacy
Community-Based Organizations (CBOs) — Takushara, Sauka, Burum	Civil Society / Community	Primary project executing entities, community co-investment, local O&M, beneficiary mobilization
Women's Groups & Youth Associations (All 3 Villages)	Civil Society	Participatory design, women's needs advocacy, local labour contribution, management committee membership
Local Solar Technology Supplier / Installer	Private Sector	Equipment supply, technical installation, commissioning, warranty support, technician training
Primary Health Care Development Agency (FCT-PHCDA)	Government Health Authority	WASH and public health standards compliance, health facility connection to Burum mini-grid

7. PROJECT REPLICATION AND UP-SCALING STRATEGY

A central feature of this project is its explicit design for replication and scale. From the outset, the project is structured as a demonstration model whose technical, financial, and governance features are documented, packaged, and disseminated for adoption by other communities, local government areas, and state governments across Nigeria and the broader West Africa region.

Replication Pathway	Strategy & Mechanism
Knowledge Documentation & Packaging	Development of a comprehensive Community Solar Mini-Grid Toolkit, drawing on project lessons, technical specifications, community governance templates, and O&M manuals; available in English and Hausa for local accessibility. Published on GEF SGP Nigeria knowledge platform and REA's mini-grid portal.
Policy Influencing & Government Mainstreaming	Project documented as a model for FCT Rural Electrification Strategy; engagement with National Electrification Project (NEP) under the Federal Ministry of Power to mainstream community-owned mini-grid models; submission of policy brief to REA for integration into national mini-grid development guidelines.
Peer Community Learning	Facilitated learning visits between Burum District communities and 3–5 other

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Exchange	FCT/Nasarawa State communities to be identified by ESWAYDI forwarded to SGP as replication candidates; community-to-community mentoring model embedded in project exit strategy.
Up-scaling: Phase 2 Planning	Feasibility assessment built into project design for Phase 2 expansion: (i) Addition of 45kW to Burum mini-grid; (ii) Extension of Sauka mini-grid to adjacent settlement; (iii) Replication of borehole + toilet model in 3 additional Burum District communities, informed by Phase 1 lessons.
Gender & Social Inclusion Replication Model	Women's micro-enterprise energy access model, gender-responsive toilet design, and women-led management committee governance framework packaged as a standalone replication guide for gender-sensitive clean energy projects.

8. SDG ALIGNMENT & CROSS-CUTTING THEMES

SDG	Goal	Project Contribution
SDG 1	No Poverty	Income-generating opportunities from electricity access for micro-enterprises
SDG 3	Good Health & Well-Being	Clean water access; improved sanitation; health facility electrification
SDG 4	Quality Education	School electrification enabling evening studies and digital learning
SDG 5	Gender Equality	Women-led management committees; gender-responsive sanitation; safety through lighting
SDG 6	Clean Water & Sanitation	Solar-powered borehole; Smart Public Toilet facility
SDG 7	Affordable & Clean Energy	31.92 kW clean solar energy installed; affordable tariffs
SDG 8	Decent Work & Economic Growth	15+ green jobs; productive use of energy for enterprises
SDG 11	Sustainable Communities	Solar streetlighting; resilient community infrastructure
SDG 13	Climate Action	~70 tCO ₂ e/year GHG reduction; community climate resilience
SDG 15	Life on Land	Reduced wood fuel demand; ecosystem pressure reduction
SDG 17	Partnerships for the Goals	Multi-stakeholder partnership; government-CSO-private sector collaboration

9. MONITORING, EVALUATION & REPORTING FRAMEWORK

Monitoring Mechanisms

- Baseline, mid-term, and end-line surveys (disaggregated by gender and vulnerability)
- Monthly community self-monitoring reports using SGP community scorecard tool
- Quarterly progress reports submitted to SGP national coordinator
- Remote technical monitoring via mini-grid smart meters and pump controllers
- Annual independent technical audit of all installed systems
- End-of-project evaluation including beneficiary satisfaction survey

Key Performance Indicators (KPIs)

- Number of households with new electricity access (target: 250+)
- Number of persons with clean water access (target: 500+)
- GHG emissions reduced (tCO₂e/year) — verified against IPCC emission factors
- % women in management/governance roles (target: ≥40%)
- Number of enterprises using mini-grid electricity (target: 30+)
- Mini-grid system uptime/availability (target: ≥95%)
- Community energy fund balance growth over project period

Reporting & Knowledge Management

- Quarterly narrative and financial reports to UNDP/GEF SGP
- Annual PIR (Project Implementation Review) submission
- Project case study published on SGP global knowledge platform
- Photos / Video documentary profiling community transformation — for SGP communications
- Data submitted to GEF Tracking Tool: Climate Change Mitigation sheet
- Contribution to Nigeria SGP Country Portfolio Evaluation (CPE)

Safeguards

- Environmental and Social Management Plan (ESMP) developed and implemented
- Grievance Redress Mechanism (GRM) established at community level
- Child protection and gender-based violence (GBV) safeguards applied
- FPIC documentation maintained and accessible to all beneficiaries
- Financial controls: dual-signatory accounts; quarterly audits

PROJECT CONTACT INFORMATION

Executing Organisation

Community-Based Organisation (CBO)
Burum District, FCT Abuja, Nigeria

Project Location

Takushara Village | Sauka Village | Burum Village
Burum District, Federal Capital Territory (FCT),
Abuja

GEF SGP National Coordinator

UNDP Nigeria Country Office
Plot 617/618 Tigris Crescent, Maitama, Abuja, FCT

Programme

GEF Small Grants Programme (SGP) —
Operational Phase 7
Focal Area: Access to energy

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