



Projects for Sustainable Development -
Global Marketing of Photovoltaics

Solar Powered Irrigation Systems for Food and Nutrition Security (SPIS-4-FNS) in the Upper Ewaso Ng'iro Basin: Progress in 2025

Stakeholder Consultation Meeting

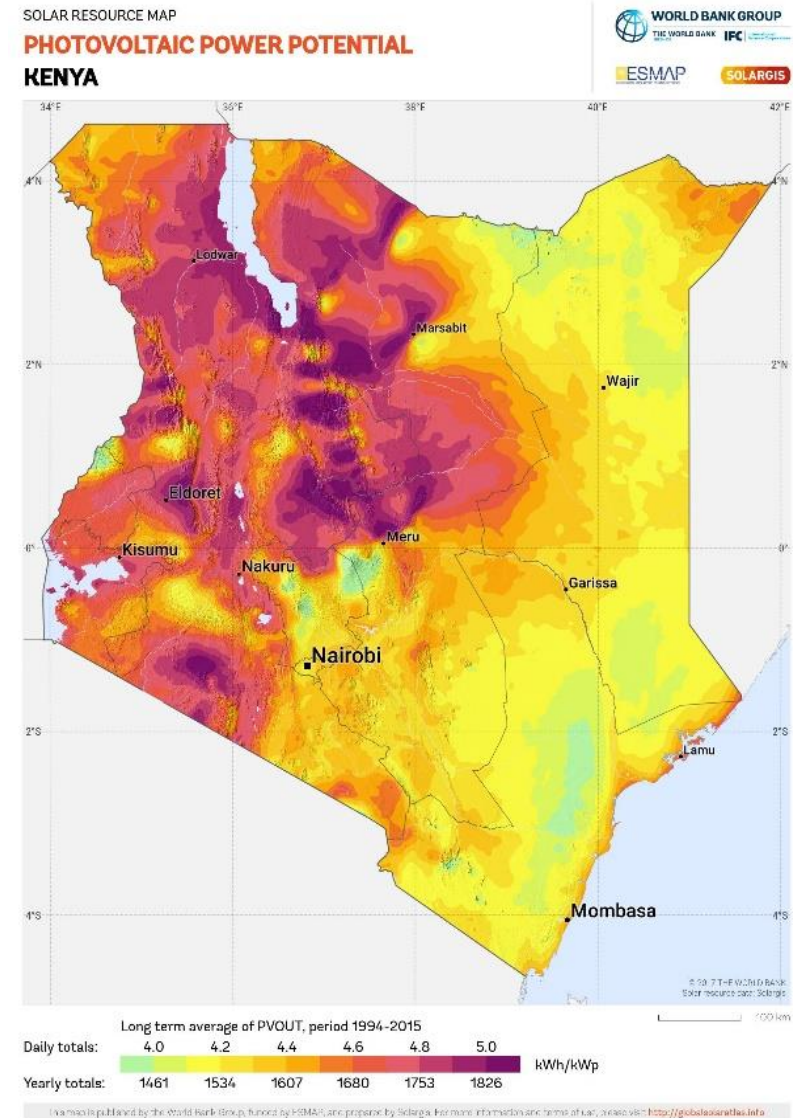
Venue: Nanyuki Sports Club

Presentation by: Prof. Bancy Mati

Dates: 12th March 2026

Kenya has Huge Potential from Solar Energy

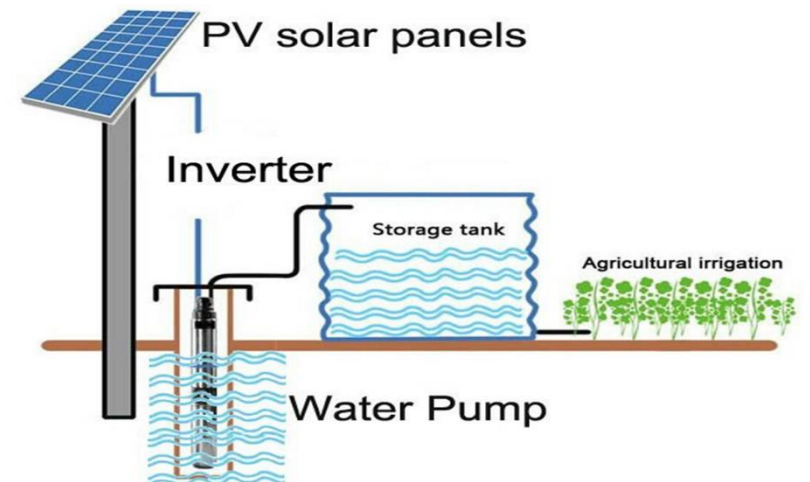
- Kenya receives daily insolation¹ of 4-6kWh/m², with an average of 5-7 peak sunshine hours daily
- Some 10-14% of this energy can be converted into electricity
- Solar radiation reaches the whole country daily
- The total potential for **photovoltaic** installations is estimated at 23,046 TWh/year.
- But much of Kenya's solar energy potential remains largely untapped



¹Source: *Global Solar & Water Initiative (GSWI), 2017*

Evolution of Solar PV Development in Kenya (*last 50 years*)

- **1970s** -solar photovoltaic (PV) systems to operate broadcast installations (masts) in remote areas
- **1980s**, solar light of schools, health centres and water pumping pushed by international donors and NGOs.
- **1990s** – Era of SAPs and general economic recession: solar adoption went down, with only limited purchases by private sector users.
 - *solar systems were large, complicated & expensive. Most failed due to poor installations 7 maintenance*
- **2000s** – upsurge in use of solar powered batteries to light homes, for TV and to charge mobile phones
- **2010** – Introduction of DC water pumping opened new impetus for SPIS – *no need for batteries, inverters...*
- **2026** – Adoption of SPIS is still very low, mostly due to lack of information, *technology is reliable & affordable*

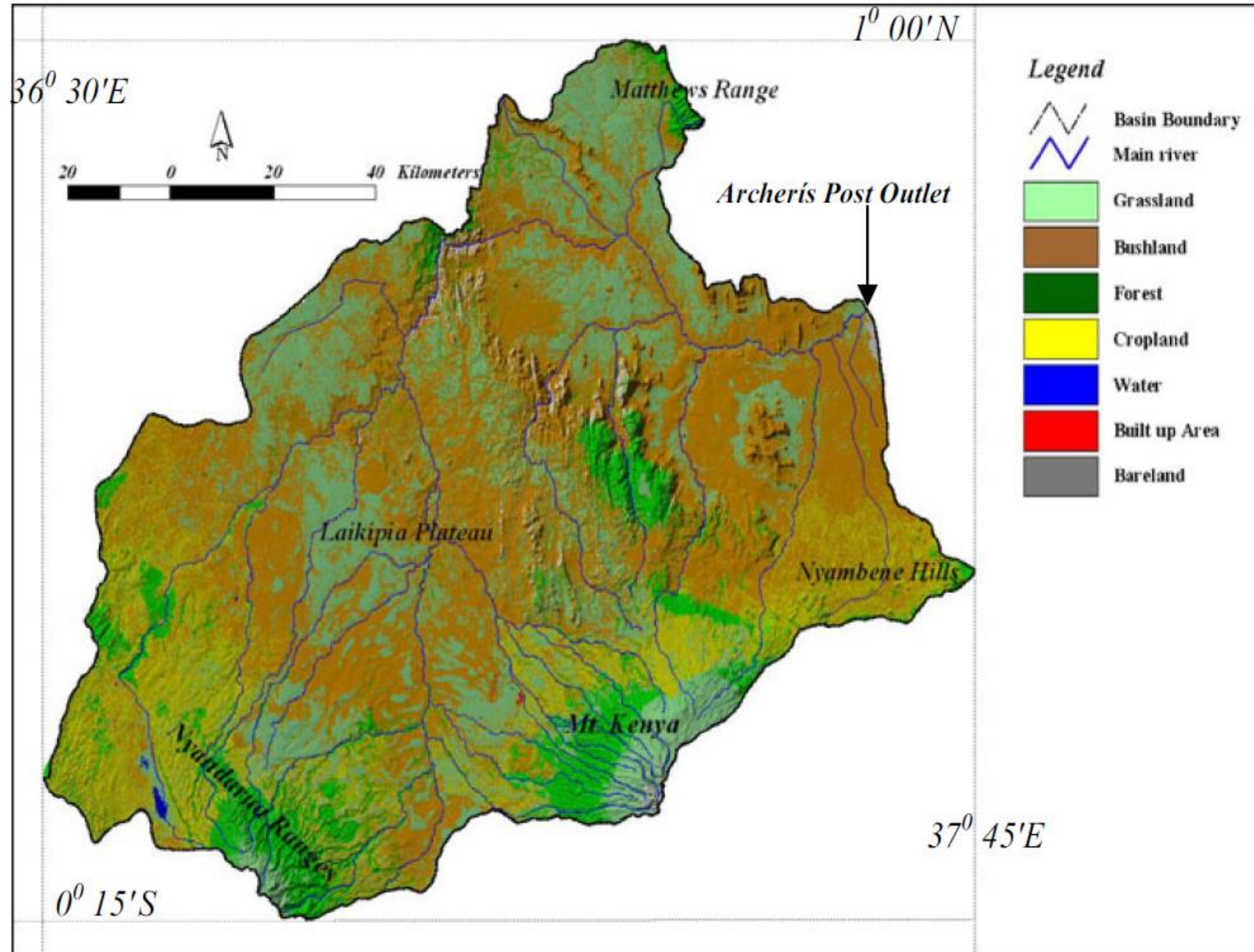


Introduction to Upper Ewaso Ng'iro basin

Some basics: Land use and Livelihoods

Study area: 15,200 km²

- ❖ Smallholder Agriculture - Rainfed (mixed) farming
- ❖ **Smallholder Agriculture - irrigated**
- ❖ Livestock keeping (pastoralists)
- ❖ Large-scale Commercial Farming (wheat, barley)
- ❖ Large-scale Commercial Farming (export horticulture)
- ❖ Wildlife and Conservancies
- ❖ Forests and protected areas (Game reserves)



Land Use Typologies in UENB



Project Progress: What has been done in one year (2025)

2023:

- 1) Project Scoping done covering Laikipia, Isiolo, Meru –(Only 3 out of 150 farmers had SPIS –solar)
- 2) Stakeholder Workshop was held in Nanyuki and the project was approved by stakeholders

2025

- 1) SPIS-4-FNS full project started in February 2025
- 2) Recruitment of PhD students was done
- 3) Project launch was done, kick-off meeting with stakeholders in Nanyuki in May
- 4) Solar Powered Irrigation Expo was showcased in Nanyuki in May
- 5) Baseline survey conducted in August
- 6) Equipping the Laikipia Light House farm (Susan) in September
- 7) Equipping the Isiolo Light House farm (George) in October
- 8) Recruitment of Master degree students in October
- 9) Equipping the Meru Light House farm (Edward) in November
- 10) ToT training held at JKUATES in November
- 11) Launching of the SPIS equipment in the 3 LHF's in December
- 12) Training of farmers at LHF's in Laikipia, Isiolo, Meru done in December
- 13) Stakeholder Workshop with farmers held in Nanyuki in December

Participants at Stakeholder workshop in Sept 2023 –project approved



Laikipia, Susan Mwangi LHF



Cluster farmers field Day in Laikipia

Isiolo, George Kaiyo LHF



Cluster farmers field Day in Isiolo

Meru, Edward Mutiga LHF



Cluster farmers field Day in Meru

Lessons Learnt

- There is great scope to improve productivity of pumped irrigated agriculture through solar powered irrigation
- Farmers have recorded huge savings on costs of pumping (let farmers share those experiences and savings).
- SPIS is very useful for farmers with water pans to improve water lifting with free energy.
- SPIS bundled with drip irrigation will improve overall efficiency of irrigation (save water).
- Farmers engaged in irrigation can afford to shift to SPIS (hesabu garama)
- The biggest problem has been mostly knowledge disconnect between farmers, service providers, extension, researchers, Govt
- This project will assess a number of options to improve adoption of SPIS, e.g. we are testing the energy efficiencies compared to petrol, KPLC tokens, the extent to which SPIS can be geographically scaled etc
- **Our research has just started, learning is continuous – We are all learning**

Thank you

