UNAM Ogongo Agri-PV Demonstration Site Profile

Omusati Region

Oshakat

Site Profile

Name of farm/site: UNAM Ogongo (Agricultural Campus)
Region: Omusati Region
Location: Approximately 770 km from Windhoek and 55 km from Oshakati
Area: 4,350 ha farm (of which 1,000 ha serves as game park):

fruits and vegetables, mahangu, maize, rice, dairy, beef and poultry **Coordinates:** 15° 18' 8.516" **E** and 17° 40' 51.827" **S Year founded:** 1973

Campus Director: Dr C. Mberema

Research Coordination: Prof. S. Awala (Agriculture) and Dr P. Dobreva (PV) **Email:** sawala@unam.na / pdobreva@unam.na

Scheme (Intent)

Research institution: University of Namibia (UNAM) campus focusing on training, research and community engagement in agriculture production, management of natural resources, and environmental science

Academia	Research Crops
Student population: Approximately 500 students Faculty: Agriculture, Engineering, Natural Sciences School: Agriculture and Fisheries Sciences	Crops/produce: Tomato, Potato, Sweet Potato, Cowpea

Agri-PV System Design

Total allocated area: 1.740 ha (equals about 2.5 football fields)

Agricultural area under Agri-PV System and control fields area: 0.6 ha

Solar system type: Grid-connected system – net-metering with the Northern Electricity Distributor (NORED) **Total installed power capacity:** 377.3 kilowatt-peak (kWp)

Expected energy production: 2,192 kilowatt-hour (kWh) daily and 800 megawatt-hour (MWh) annually (equivalent to power approximately 225 households based on the Electricity Control Board's 2022 household energy consumption estimate) **Solar panels:** 686 Monocrystalline Monofacial Solar Panels [550Wp]

Four different system designs (east-west orientation):

System Design 1	System Design 2	System Design 3	System Design 4
Standard Trackers	Lifted Trackers	Overhead Structure	Overhead Structure
(Hub Height: 1.16 m)	(Hub Height: 2.7 m)	(Design: Checker-Board)	(Design: Opaque)

Experiment under Agri-PV System

PV research component:

- The temperature of the solar modules is monitored with thermistors attached to the backside of the modules.
- The plane-of-array irradiance (POA) is monitored with a reference solar cell.
- The energy output of the system is monitored at inverter level at high temporal resolution.
- The state of the solar modules and the module soiling is monitored with regular current-voltage tracing measurements.

Agricultural research component:

- Split-split plot experiment (3×2×2m) conducted on one crop per season (for four seasons) in a randomised complete block design (RCBD)
- Main experimental treatments comprise 3 shade, 2 irrigation and 2 nitrogen levels
- Four replications in the standard trackers, lifted trackers and control field
- Three replications in the fixed overhead
- Irrigated with drip lines

Growing Seasons	Crops (Variety)	Intra- x Inter-row Spacing (cm)	Expected Growth Duration (Days)
Sep-Dec 2024	Tomato (STAR 9068)	30×75	112-140
Jan-Apr 2025	Cowpea (Nakare)	30×75	90-120
May-Aug 2025	Potato (Mondial)	30×75	110-120
Sep-Dec 2025	Sweet Potato (Blesbok)	30×75	120-150





















