



Farming for Resilience (F4R) • CONCEPT NOTE

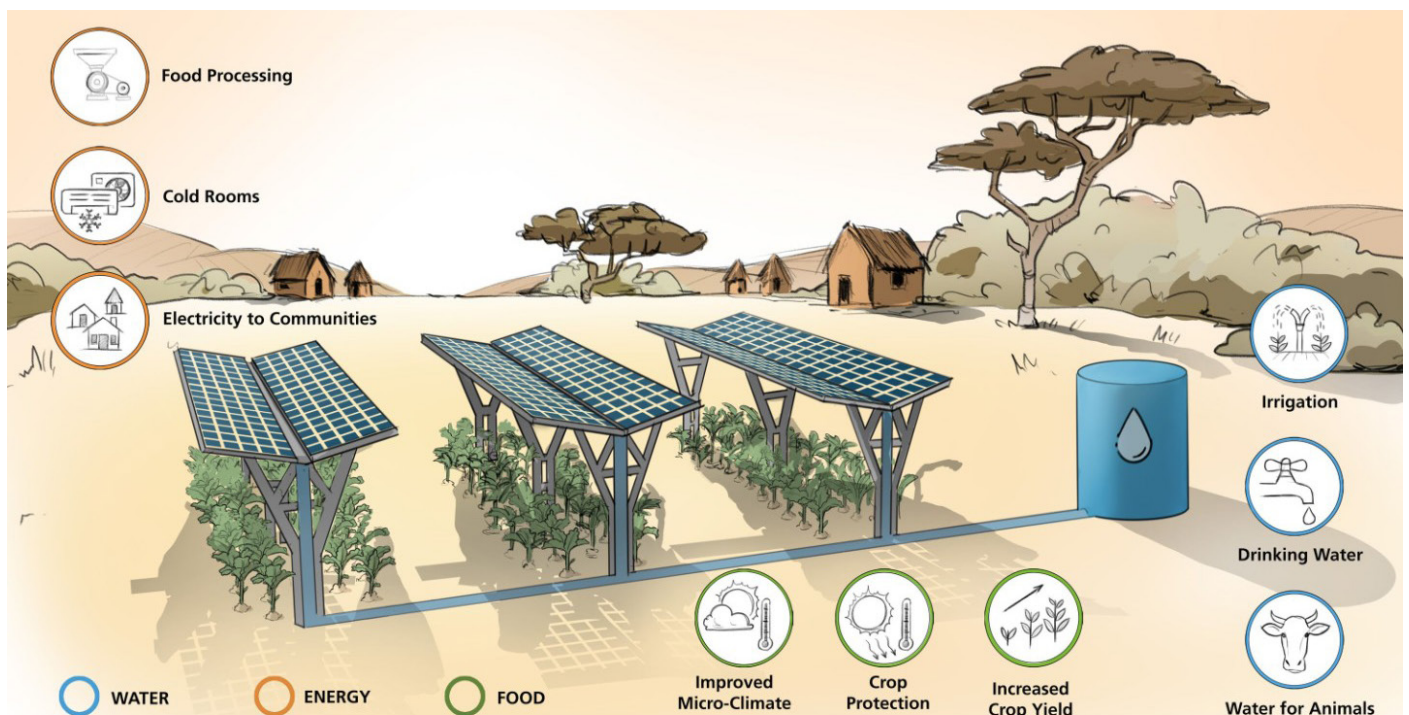
INSPIRED – Agri-PV: Sustainable Use of Agrivoltaics in Namibia

Background

In 2022, Namibia covered 72% of its national electricity demand through costly imports from neighbouring countries, compromising the competitiveness and productivity of local primary and secondary industries, including the agricultural sector. The electrification rate is recorded at 56% of the total population, however, merely 35% of the population living in rural areas have access to grid-based electricity. Considering the low population density and vastness of Namibia and the comparatively high electricity costs, rural electrification comes at a high price for grid operators and consumers alike. In the context of smallholder farmers, the lack of access to (affordable) electricity manifests itself in low productivity due to a lack of efficient irrigation and high post-harvest losses in the absence of on-farm cooling, processing and marketing solutions. Although classified as a middle-income country, food and nutrition security and unemployment are pressing development challenges for Namibia, especially in rural areas. Approximately 660,000 people (about 27% of the population) are currently affected by critical food insecurity, unemployment stands at 47% and multidimensional poverty is recorded to be 59% in rural areas. At the same time, Namibia records more than 300 sunny days per year and consequently has an enormous solar energy potential to electrify rural areas, to foster local food production and to create employment along green value chains as a driving force for rural transformation and progress.

INSPIRE(D) Agriculture – Agrivoltaics as a Solution for Sustainable Food Production and Green Value Chain Development in Namibia

With funds from the German Federal Ministry of Economic Development and Cooperation (BMZ), the Farming for Resilience (F4R) Project, a joint initiative of GIZ and the Namibian Ministry of Agriculture, Water and Land Reform (MAWLR), is teaming up with the Fraunhofer Institute for Solar Energy Systems ISE, Europe's largest solar research institute, to pilot agrivoltaics (Agri-PV) as integrated photovoltaic shade-gardens for crop production and value chain development, tailor-made for the context of smallholder farmers in Namibia. While providing shelter to protect plants against high radiation and extreme weather events, the photovoltaic energy serves to power a number of processes, such as: irrigation systems; drying and cooling facilities for improved post-harvest practices; processing machinery for on-farm value addition; digitalisation for business and marketing purposes. In addition to the availed electricity for productive use, experiments conducted with Agri-PV have shown an increase in yields of up to 20% due to optimised irrigation, shade and soil nutrient conservation.



## Objective

The Agri-PV initiative seeks to prove the viability of tailor-made, user-friendly and efficient Agri-PV systems as a sustainable, innovative and profitable multipurpose solution for agricultural production and green value-chain development in Namibia, particularly for smallholder farmers in off-grid areas. The focus of the pilot project is placed on individual and organised smallholder farmers with a particular focus on women and youth in three different agroclimatic areas of Namibia. Ultimately, the initiative seeks to generate evidence-based information for replication and further investments in locally manufactured small to large-scale Agri-PV systems as a climate-adapted, resilient, and green means of agricultural production.



### Key milestones of the Agri-PV initiatives include:



3 Agri-PV demonstration systems are operational



Productivity of Agri-PV sites increases by 20%



At least 6 different crops are tested



1,000 people participate in Agri-PV-related trainings or information events



Results of the Agri-PV projects are shared with relevant stakeholders

## Approach

The pilot phase of the Agri-PV initiative envisages the installation of at least three contextually adapted Agri-PV demonstration sites in intervention areas of the Farming for Resilience (F4R) project, accompanied by scientific research in order to generate evidence-based information on the effectiveness and suitability of Agri-PV systems for the Namibian context. At the outset and throughout implementation, information events, lectures, technical workshops and specialised training courses will be organised for interested emerging and established farmers, for representatives of relevant Government institutions, commercial banks, solar companies and other industry stakeholders. This inclusive approach aims to promote locally produced Agri-PV systems as an innovative, climate-adapted and profitable solution for sustainable vegetable and fruit production in Namibia.



## GIZ Namibia - Farming for Resilience (F4R)



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