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AGRA
Sustainably Growing Africa's Food Systems

Theme 4: Managing dryland soil health and water resources

T4PP001:

Online platforms for easy access to plant genetic resources for food and agriculture

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Access to plant genetic resources and availability of an associated passport, characterization, and evaluation data are critical for enhancing the use of germplasm in crop improvement. Genebank at ICRISAT is one of the largest international genebanks conserving over 129,000 germplasm accessions of 11 crops, including eight dryland cereals (sorghum, pearl millet, finger millet, foxtail millet, proso millet, barnyard millet, kodo millet, and little millet) and three dryland legumes (chickpea, pigeonpea, and groundnut), and their wild and weedy relatives, each accession with a unique DOI. The germplasm has been collected/acquired from 144 countries, following the international genebank standards and policies. The germplasm conserved comprises about 81% landraces, 16% breeding lines/advanced cultivars/ genetic stocks, and 3% wild and weedy relatives. Information on passport and characterization data of the entire set of germplasm conserved at the ICRISAT genebank is available in open access to researchers through the ICRISAT Genebank database (http://genebank.icrisat.org/). Researchers can view the list of diversity subsets and traits-specific subsets, and also use the filter function available in the database to select desirable germplasm. Germplasm resources at the ICRISAT genebank are linked through another database, Genesys-PGR (https://www.genesys-pgr.org/), an online platform on Plant Genetic Resources for Food and Agriculture conserved in genebanks worldwide. The Genesys-PGR contains over 4,283,000 germplasm digital information of different crops conserved ex-situ in genebanks, worldwide, including over 260 germplasm subsets, and >440 germplasm characterization and evaluation datasets for researchers. This database provides easy access to plant genetic resources for use in crop improvement. ICRISAT Genebank distributed over 1.59M germplasm seed samples through 8658 signed SMTAs to researchers belonging to 150 countries globally.

T4PP002:

Solar-powered irrigation system as a game changer to improve agricultural practices in west Africa: a case study from Mali

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In rainfed agricultural systems, sustainable and efficient water management practices are key to improved agricultural productivity and natural resource management. The agricultural system in sub-Saharan Africa (SSA) relies heavily on the availability of rainfall. With the erratic and unreliable rainfall pattern associated with poor and fragile soils, agricultural productivity, however, has remained very low over the years. Much of the SSA agricultural land has been degraded with low fertility as a result of ongoing cultivation and wind and water erosion. This has resulted in an increased food shortage due to the ever-increasing population and land degradation. Better agricultural and nutritional security are also further hampered by the lack of reliable access to the available water resources in the subsurface hydrological system. In this study, socio-economic data from 112 farm households and Boolean and Fuzzy methods were employed to understand farmers' perception and identification of suitable areas to implement Solar Based Irrigation System (SBIS) in the agro-ecologies of Bougouni and Koutiala districts of southern Mali. Results revealed that the usage of SBIS has been recent (4.5 years), majorly (77%) constructed by donor-funded projects for the purpose of domestic water use (60%), followed by livestock (28%), and irrigation (15%). Vegetable production was the dominant water use (60%) enabling rural farm households to gain over 40 % of extra household income during the dry season. Results further showed that 4274 km2 (22%) of the total land area for the Bougouni district, and 1722 km2 (18%) for the Koutiala district are suitable for solar-powered irrigation installation. As smallholder farmers cannot afford hydrocarbon-energized motor pumps or electrical pumps and the affordability of solar panels in many rural places makes SBIS to be an emerging climate-smart technology for most rural Malian populations.