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# COMMITTEE ON AGRICULTURE

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**Towards a Global Programme on Sustainable Dryland Agriculture**

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## I. Introduction

1. Drylands are home to an estimated 2 billion people, about 90 percent of them in developing countries (FAO, 2019). Drylands are also home to a great variety of indigenous livestock breeds and plant species that are essential for food security and livelihoods. Based on the FAO Global Agro-Ecological Zones (GAEZ) modelling system, drylands represent 43.2 percent of total global area in 2020, and are predicted to be 44.2 percent in 2050. Poverty, food insecurity, biodiversity loss, frequent droughts and environmental degradation are increasing due to the effects of climate change. Water scarcity at critical times during agricultural seasons is making dryland populations excessively vulnerable in the absence of appropriate technologies and risk management strategies.

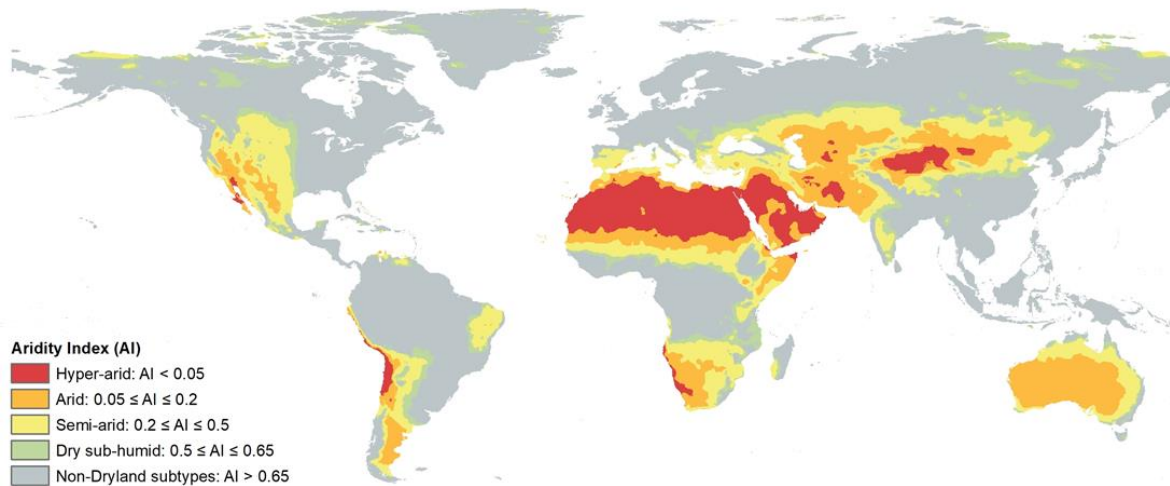


Figure - Global distribution of drylands, 2020<sup>1</sup>

2. Agriculture in the drylands is dominated by small-scale and resource poor farmers. It is characterized by declining crop yields and livestock productivity and suffers from limited investment in agricultural technologies and inputs. Mono-cropping and tillage based farming system, overgrazing, cultivation of soils in marginal areas and residue removal for fuel or fodder has caused severe land degradation, soil erosion and loss of fertility in drylands. Bare soils are prone to erosion from winds and floods. The production tools and cultivation techniques used in the dryland farming are primitive and the ability to resist pests, diseases and natural disasters is low.

3. The Global Programme on Sustainable Dryland Agriculture (Global Programme) will use an integrated, participatory and evidence-based approach to nurture agricultural systems that are sustainable; protect the environment, economically viable, ensure social equity, and that can feed increasing populations irrespective of climate shocks. The Programme will harness the outputs of innovative approaches and successful research and development projects, to raise awareness of the potential technical interventions required to foster sustainable agricultural production systems in drylands.

4. The most suitable technologies will be selected for each country, agro-ecological zone, production systems and tailored to socio-economic conditions. Adoption will be facilitated through practical and participatory demonstrations, validation, monitoring and supported by the development of enabling policies and strategies. The programme will rely on strong coordination between multi-stakeholder partners that only FAO can coordinate on a global scale.

5. The Global Programme will be operationalized as a core component of FAO's *Hand-in-Hand Initiative (HHI)*<sup>2</sup> initiative, as an evidence-based, country-led and country-owned initiative to eradicate poverty, hunger and malnutrition by accelerating agricultural transformation and sustainable

<sup>1</sup> The figure developed by FAO using P/PET ratio (AI) from the GAEZv4. <http://www.fao.org/gef/dryland-sustainable-landscapes/en/>

<sup>2</sup> Progress in *Hand-in-Hand Initiative* <http://www.fao.org/3/nc857en/nc857en.pdf>

rural development of drylands in order to achieve the Sustainable Development Goals (SDGs). It will establish synergies with other global programmes and initiatives of FAO, including The Global Framework on Water Scarcity in Agriculture (WASAG)<sup>3</sup>, and research and development partners such as One-CGIAR, to coordinate interventions that address issues such as drought, salinity and related challenges of dryland farming systems.

## II. Programme Objectives

6. The overall objective of the Global Programme is to improve food and nutritional security, livelihoods and environment sustainability in drylands by strengthening capacities of a wide group of smallholders (including men and women farmers, small livestock holders and pastoralists, researchers, agriculture and extension specialists, private sector) and will provide business opportunities that engage the youth. An enabling environment will be fostered through the development of appropriate policies and regional strategies to ensure adoption and promotion of sustainable crop, livestock, soil, forest and water management in drylands under a changing climate.

7. The Programme will focus on the following specific technical objectives:

- conserve, enrich and revitalize soil to prevent erosion and promote the sustainable management of rangelands, stabilise deserts and restore fertility to resource poor lands through cultivation of trees, shrubs, bushes and adapted crop species;
- efficiently capture, conserve, distribute and use water for sustainable agricultural production and ecosystem management;
- demonstrate and promote diversification of cropping systems and soil-crop-water-livestock-nutrient-pasture-tree management of rangelands;
- improve access to technologies, inputs, services, markets and financial resources, particularly for women and the youth, to support crop and livestock production, processing, marketing and creation of decent jobs;
- promote sustainable management of plant and livestock transboundary pests and diseases;
- support the plant and animal breeding and sustainable management of plant and animal genetic resources;
- develop capacity of farmers, pastoralists, other community members, researchers, agriculture and extension specialists, private sector to facilitate technology adoption;
- contribute to poverty reduction through strengthened rural-urban linkages and better connectivity of agricultural products to post-harvest services and markets; and
- provide enabling environment for strategic technical and operational partnerships and policy coordination and knowledge management.

8. The Programme will be implemented through four operational thematic pillars:

a) *Data platform and Toolbox for assessments and integrated decision-making.*

- i) Dryland gaps and needs assessment will be conducted through participatory and informed-based decision making process by using local to global available information, in particular from the GAEZ, Agro-ecological Zoning(AEZ) and Geographical Information System platforms as well as information from participatory stakeholder engagement process. Gaps and needs analysis will provide baseline information to identify priorities to support technologies and interventions, policies and strategies for sustainable drylands. The *HIHI* will provide a platform to integrate and visualize the biophysical, geospatial and socioeconomic data, which will then be analysed through advanced modelling to explore interactions, interdependencies, synergies and trade-offs, in order to inform strategies for investment, innovation and policy and institutional development.

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<sup>3</sup> WASAG <http://www.fao.org/land-water/overview/wasag/en/>

- ii) The Programme will encourage and support application of innovative approaches to improve the sustainability of dryland agricultural production systems. This will be done in a participatory manner by taking stock of existing practices and by supporting countries to identify the most appropriate approaches and technical options considering their specific environmental and socio-economic conditions, and integrated production systems.
  - iii) The most promising technologies, innovations and emerging technical and digital options will be harnessed a Toolbox of Sustainable Dryland Agriculture. This will be publicized through a web portal and options tested among those countries with similar environmental and socio-economic conditions. Examples of potential context-specific, low-cost tools and emerging technologies in the Toolbox include: conservation agriculture (CA) with complementary best agronomic practices; protected cultivation (low-cost and energy efficient greenhouses, net-houses, shade-houses, rain shelters, hydroponics, soilless and aquaponics), drip irrigation systems and non-conventional water use in agriculture, diversification and integration of cropping and livestock systems and biodiversity enhancement (through introduction of drought and salt tolerant species and varieties, including forages, and sustainable practices and management of the rangeland, promotion of neglected and underutilized species), sustainable rangeland and pasture management (holistic management, rotational grazing), integration of agro-forestry and livestock, use of renewable energy (solar panels for pumping water, cooling the greenhouses), waterboxes (for growing trees in the resource scarce environment), e-agriculture, sustainable mechanization, precision agriculture, ag-robotics and drone technologies (particularly for monitoring and management of pests and diseases and biomass and water, and improving soil fertility).
- b) *Enabling environment for policies, strategies, investments and partnerships.*
- i) Support will be provided to carry out studies, review, improve and harmonize the national legislations related to crop, livestock, pastoralism, land, water and forestry sector development in drylands. Context-analyses will be carried out to identify potential conflicting dynamics among stakeholders (e.g. farmers, foresters, pastoralists, fisher folks,) and to recommend solutions.
  - ii) Existing national and regional policy aspects, such as those under the legally binding agreements and conventions (e.g. Codex Alimentarius, International Plant Protection Convention, International Treaty on Plant Genetic Resources for Food and Agriculture, Rotterdam Convention) will be used for information exchange and strengthened cooperation. Results based on testing of technologies, innovations and approaches, will be used to inform which policies and strategies are required to ensure adoption of best practices.
  - iii) The Global Programme will support the territorial markets and sustainable local value chains as part of a sustainable food systems approach for the targeted landscapes and countries. Lessons learned from City Region Food System Programme will be harnessed to efficiently link agricultural production with value chain actors and markets through ensuring appropriate governance frameworks<sup>4</sup>. Particular attention will be given to engagement of private sector actors to develop sustainable supply chains and implement innovative technologies, including agricultural machinery use and related services (hire services, repair and servicing).
- c) *Capacity development, strengthening institutions, infrastructure and services*
- i) Adoption and promotion of technologies and innovations will be facilitated by season long trainings for researchers, farmers, farmer organizations, agricultural and

<sup>4</sup> <http://www.fao.org/in-action/food-for-cities-programme/approach-old/crfs/en/>

extension specialists through Training of Trainers/Facilitators, practical demonstrations, field days, Farmer Field Schools (FFS) and Agro-Pastoral Field Schools, on-the-job-trainings, farmers' exchange visits. Technical trainings and study tours will cover a wide range topics related to sustainable crop, land, water, forest and livestock management, mechanization, business management, post-harvest services and marketing.

- ii) All training modules and technology transfer methodologies will be developed using bottom-up participatory approaches with active involvement of a wide group of stakeholders and communities to assess, identify, and test options for improving crop and livestock production and pastoralist livelihoods for each country, agro-ecological zone and socio-economic category.
- iii) Specific capacity building activities designed for women's groups will take into account the changing roles and increasing responsibilities of women, beyond the traditional care of households, to foster their full inclusion in supply chains, while at the same time promoting their engagement in communities' decisions. Moreover, involvement of young researchers, experts and entrepreneurs will be promoted through targeted activities that are specific to the development of sustainable agriculture in the drylands.
- iv) Innovative practical manuals, guidelines, video and online e-learning courses, smart phone applications will be developed for diagnostics to identify pest/disease/biomass production/water/nutrient constraints, promoting investments, local partnerships and recommend solutions on sustainable crop, land, water, forest and livestock management in drylands. .

*d) Knowledge sharing and information exchange for awareness and advocacy*

- i) Global and regional platforms will be developed to facilitate exchange of knowledge and information on dryland agriculture, and to foster regional cooperation for countries and local actors facing similar issues. Platforms will share lessons learned, tested technologies and approaches, best practices, to provide available resource material and case studies from different scenarios. In parallel, innovative tools and approaches will be developed and made available to facilitate participatory approaches to populate and improve local and national AEZ information (e.g. using social media, crowdsourcing, etc.).
- ii) Exchange of knowledge and information will be supported by strengthening institutional arrangements, existing hubs and networks, collaboration and coordination, empowering regional entities involved in sustainable drylands as well as facilitating access to information and data (e.g. through data and germplasm sharing agreements). Regional and global research and academic entities will be engaged to facilitate new knowledge where there are current gaps in understanding.
- iii) South-South and Triangular Cooperation, including between countries involved in the Programme will be strengthened. Successful technologies and approaches on sustainable agricultural production in drylands, experiences on transfer of information and knowledge sharing mechanisms, will be scaled among countries with similar environmental and socio-economic conditions.
- iv) The Programme foresees the organization of the regional and inter-regional workshops and international conferences on sustainable crop, livestock, land, forest and water management in drylands. These events also will serve as the platform for face-to-face participatory exchanges to raise awareness, publicize and share knowledge and lessons learned for policy makers and practitioners.

9. The Programme will be targeted to low-income, low-capacity countries, many of which are located in the dryland zones, for a minimum period of five years. The critical priority areas for actions at country level will be identified to ensure that the interventions help achieve maximum impact in the medium and the long term.

10. For the Programme resources will be leveraged through the engagement of multiple resource partners, financial institutions and the private sectors agencies to ensure that innovations and sustained investments are available for transformation of dryland agriculture systems. Further, resources will be mobilized with traditional and emerging resource partners at global regional and national level. Government supported and partnership programmes will assist in the demonstration and upscaling of actions to other regions and countries and will include ongoing initiatives such as Africa's Great Green Wall and the Sustainable Forest Management Drylands Sustainable Landscapes Programme among others. A key mechanism for partner and donor engagement and for the exchange of technologies and policies will be through South-South and Triangular Cooperation. FAO will establish Multi-donor Trust Fund to ensure sustainability of the Global Programme.