

AGRICULTURE IN WATER SCARCE AREAS: *water use efficiency, water quality*

INTENSIVE AND SUSTAINABLE PRODUCTION OF SAFE AND ADEQUATE FOOD REQUIRES RESPONSIBLE MANAGEMENT OF WATER RESOURCES. THE GLOBAL EXPANSION OF IRRIGATED LAND (NOW ESTIMATED AT 3 BILLION HECTARES) NECESSITATES SYSTEMATIC (AND EQUITABLE) MANAGEMENT OF WATER RESOURCES. FARMING PRACTICES, INCLUDING THE CHOICE OF CROPS TO BE GROWN, CAN BE ADJUSTED TO ENSURE THE OPTIMUM USE OF WATER RESOURCES. WATER QUALITY MAY ALSO BE AFFECTED BY INTENSIFICATION OF CROP PRODUCTION IF AGRICULTURAL INPUTS SUCH FERTILIZER OR PESTICIDES ARE USED INAPPROPRIATELY.

AFGHANISTAN *irrigation*

Decades of war have destroyed a large part of Afghanistan's irrigation and other water supply systems, which are vital for food security and the agricultural economy. Recent years with drought have complicated the situation in Afghanistan.

The nationwide Emergency Irrigation Rehabilitation Project (EIRP) is benefiting farmers and their families through more reliable and equitable distribution of irrigation water. This leads to increased agricultural productivity, higher incomes and improved food security.



SOUTHERN AFRICA *farming practices*

Tillage practices on southern Africa's predominantly sandy soils can involve loss of soil organic matter and soil structure. As a result, the soil moisture holding capacity of these fragile soils is reduced and crops become more susceptible to drought.

Conservation Agriculture is being adopted to reduce water losses and retain moisture in the root zone. Measures include minimizing soil disturbance and keeping the soil surface covered with mulch or cover crops. Long term conditioning of soil structure can stabilise landscapes and hydrological responses.



WEST AFRICA *water quality*

The Senegal River in West Africa has experienced repeated contamination from intensified farming. This has been most visible in the form of repeated fish kills, but farmer pesticide poisoning and chronic health problems also attest to the damage caused by the over use of certain inputs.

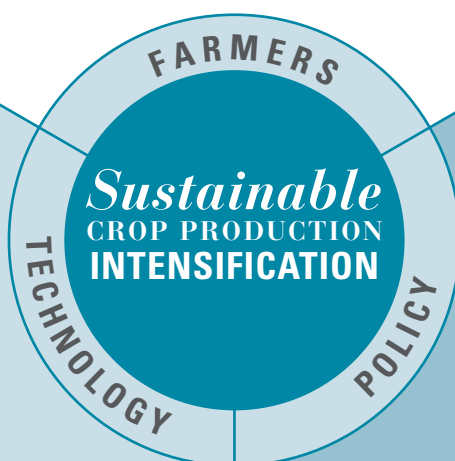
Water quality monitoring has been introduced in four neighbouring countries (Senegal, Mali, Burkina Faso and Benin) based on new membrane-based technologies. At the same time a programme of Farmer Field Schools and associated extension activities has concentrated on reducing unnecessary pesticide use.



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- improved water access and management
- implementation of irrigation infrastructure projects
- adoption of water saving technologies (water harvesting/ micro-irrigation)
- large-scale adoption of measures to improve water productivity in crops
- monitoring crop and soil water status

- techniques that save water, by shifting to water saving farming practices (no-till, mulching/cover crops) and by improving the application methods (deficit/micro-irrigation, no flooding, bed and furrow systems instead of sheet irrigation), re-cycling where possible
- monitoring of yield per unit water use as well as yield per unit land
- water-harvesting



- increased investment in irrigation service performance
- decentralization of irrigation management
- minimizing the risk of contamination of water resources with production inputs, waste or recycling products of organic, inorganic and synthetic nature
- monitoring and management of groundwater tables and groundwater quality to prevent irreversible damage to aquifers

AGRICULTURE, WHICH ACCOUNTS FOR 70% OF GLOBAL WATER USE, IMPACTS BOTH THE QUANTITY AND QUALITY OF WATER AVAILABLE FOR OTHER USES. CAREFUL AND EFFICIENT USE OF WATER IS NEEDED WITHIN AGRICULTURE FOR IRRIGATED OR RAIN-FED CROP AND PASTURE PRODUCTION OR FOR LIVESTOCK WATERING. THIS INCLUDES MAXIMIZING THE INFILTRATION OF RAIN WATER ON AGRICULTURAL LAND AND REDUCING PERIODS OF SOIL MOISTURE DEFICITS DURING CROPPING SEASONS.

THE MAINTENANCE OF AN ADEQUATE SOIL STRUCTURE INCLUDING THE ADEQUATE SPATIAL ARRANGEMENT OF CONTINUOUS MACRO PORES AND THE MANAGEMENT OF SOIL ORGANIC MATTER ARE IMPORTANT FACTORS TO ACHIEVE THIS. APPROPRIATE CROP OR VARIETY SELECTION, IMPROVED IRRIGATION METHODS TAKEN TOGETHER WITH JUDICIOUS APPLICATION OF FERTILIZERS AND IPM CAN NOW RESULT IN A PACKAGE OF SUSTAINABLE INTENSIFICATION THAT CAN BOTH RESPOND TO CHANGING MARKET DEMANDS AND MAXIMIZE WATER PRODUCTIVITY.

Sustainable CROP PRODUCTION INTENSIFICATION around the world

