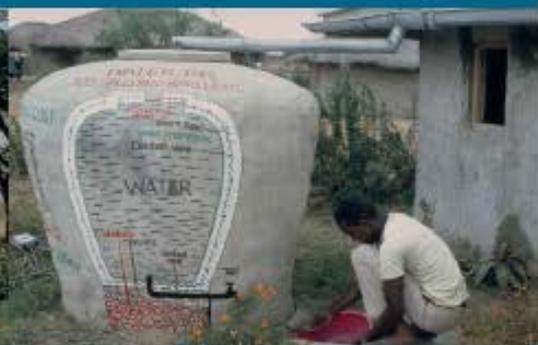# Water Harvesting

Guidelines to Good Practice

Water Harvesting Groups

WH groups and technologies are presented in a standardized way. A structured overview and short description of relevant and common technologies within each of the WH groups is given.

Floodwater harvesting

- Floodwater captured from outside farm or field, large watersheds
- One system with one catchment area
- Dry areas with ephemeral watercourses and few heavy rains
- Water stored in root zone, groundwater recharge; crop production
- Integrated watershed management (local authority & large communities)
- Flood recession farming, spate irrigation, water spreading weirs, 'warping' dams
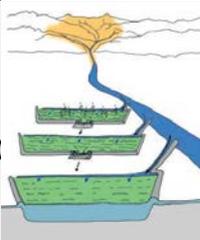
Macrocatchment WH

- Runoff trapped from outside farm or field, small watersheds
- One system with one catchment area
- Few runoff events per rainy season
- Water stored in reservoirs, root zone & groundwater recharge; multiple water use
- Managed by community or individually
- Hillside conduit, large semi-circular bunds, ponds, dams
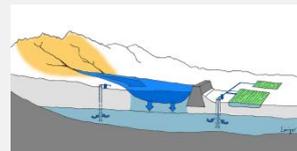
Microcatchment WH

- Localized runoff trapped within field
- System replicated many times identically and evenly over field
- Rainfall more reliable but scattered/ poorly distributed in season
- Water stored in root zone; plant production
- Managed individually or by community
- Planting pits, micro-basins, small semi-circular bunds, vegetative strips, contour bunds and ridges, trenches, stone lines
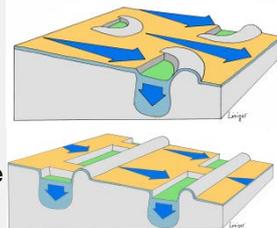
Rooftop/Courtyard WH

- Runoff trapped from settlements
- One system with one catchment
- Seasonal rainfall and with dry spells
- Surface and subsurface tanks; multiple water use (incl. drinking)
- Managed individually or by community
- Roof catchments of different materials (sheets, tiles, organic roofs), courtyard catchments of compacted/ paved surfaces
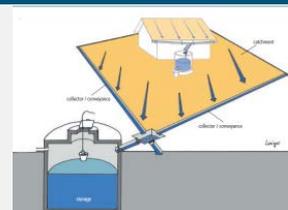
Water Harvesting Case Studies

A selection of site-specific WH practices, termed case studies, is presented in the form of a 4-page summary that can be automatically generated from the publically accessible WOCAT SLM Approaches and Technologies database. A case study consists of a description, technical specifications, implementation activities, costs, an overview of the natural and human environment as well as an analysis of impacts, economics and adoption of the technology applied in a specific context.

Floodwater Harvesting

	Eritrea	**Spate irrigation** A traditional water diversion and spreading technique under which seasonal floods of short duration are diverted from ephemeral rivers *(wadis)* to irrigate cascades of levelled and bunded fields in the coastal plains.
	Chad	**Water-spreading weirs for the development of degraded dry river valley** Structures that span the entire width of a valley to spread floodwater over the adjacent land area.

Macrocatchment Water Harvesting

	India	**Sunken streambed structure** Excavations in streambeds to provide temporary storage of runoff, incre supplementary irrigation.
	Kenya	**Sand dams** A sand dam is a stone masonry barrier across a seasonal sandy riverbed that traps rainwater and sand flowing down the catchment.

Microcatchment Water Harvesting

	Syria	**Furrow-enhanced runoff harvesting for olives** Runoff harvesting through annually constructed V-shaped microcatchments, enhanced by downslope ploughing.
	Burkina Faso	**Vallerani system** A special tractor-pulled plough that automatically constructs water-harvesting catchments, ideally suited for large-scale reclamation work.

Rooftop and Courtyard Water Harvesting

	Nepal	**Rooftop rainwater harvesting system** A water harvesting system in which rain falling on a roof is led through connecting pipes into a ferro-cement water collecting jar.
	Tajikistan	**Roof top rainwater harvesting stored in a polyethylene lined earth** The use of an earth tank lined with a polyethylene sheet to retain rainwater collected from the roof of the house.

Water security is a prerequisite to achieve food security. Water harvesting offers under-exploited opportunities for the drylands and the predominantly rainfed farming systems of the developing world. The principle is simple: capture potentially damaging rainfall runoff and translate this into plant growth or water supply. This makes clear sense where rainfall is limited, uneven or unreliable with pronounced dry spells.

These guidelines introduce the concepts behind water harvesting and propose a harmonised classification system, followed by an assessment of suitability, adoption and up-scaling of practices. Four water harvesting groups are presented and, for each, a selection of good practice in the form of case studies is given. These case studies are presented in the systematic, consistent and standardised format developed by the World Overview of Conservation Approaches and Technologies (WOCAT).

These practical guidelines offer a menu of technologies that can form part of an overall adaptation strategy for practitioners in the field and inform decision makers and donors to better understand and implement their choices. These technologies are flexible and if needed can be adjusted to the local context while being embedded into institutional frameworks. The aim is to stimulate discussion and new thinking about improved water management in general, and water harvesting in particular, within rainfed agriculture, particularly in the drylands and to facilitate, share and upscale good practice in water harvesting given the state of current knowledge.