



Water harvesting experience in sub-Saharan Africa – lessons for sustainable intensification of rainfed agriculture and the influence of available soils and rainfall data

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Africa is seen by many as the continent with the greatest potential for agricultural growth, but land degradation and environmental change threaten the African soil resource more severely than in many other regions of the planet. Achieving future food security will depend mainly on increasing production from rainfed agriculture. The challenge of delivering the required sustainable intensification in rainfed agriculture is most acute in the drylands – the semi-arid and dry sub-humid climatic regions. There are two broad strategies for increasing yields under these circumstances: (1) capturing more rainwater and storing it (increasing water availability), and (2) using the available water more effectively by increasing the plant growth and/or reducing non-productive soil evaporation (increasing water productivity). We focus on the first of these options - water harvesting, which is defined as, “the collection and concentration of rainfall runoff, or floodwaters, for plant production”. The benefits of water harvesting have been documented from small scale experimental plot studies, but evidence of successful adoption and impact is weak. As a contribution to improving the evidence base, we present results from an investigation conducted in SSA to gather information on progress with efforts to promote adoption of water harvesting. The intention was to investigate in detail the processes and outcomes on a large enough sample area to draw some common conclusions. This was not a comprehensive analysis of all that is happening in each country, nor was it a random sample; this was a purposive sample guided by available baseline information to permit comparative analysis. Water harvesting seems to have made the most progress where techniques can be adopted by individual farmers: in Burkina Faso and Niger micro- scale zai /tassa and demi-lune systems; in Sudan and Tanzania meso-scale majaruba and teras systems. Macro-scale systems requiring social organisation may offer greater potential benefits, but they are more difficult to implement, nevertheless some success stories are apparent: e.g. micro-watersheds in Ethiopia; flood-water harvesting in Sudan and Kenya. There is a marked contrast with much of the experience in India, where there has been greater emphasis on groundwater recharge. The very limited development of groundwater in SSA explains this, but in the absence of groundwater recharge the storage of runoff for supplementary irrigation depends entirely on small ponds. The challenge now is to develop effective methods to disseminate knowledge of successful water harvesting. We consider in particular the influence of available information on soils and rainfall.