

Planning and Managing Small Reservoirs: A Toolkit

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Introduction

People living in arid areas often experience highly variable rainfall, droughts, floods and have insecure livelihoods. Small multi-purpose reservoirs are a widely used form of infrastructure for the provision of water. They supply water for domestic use, livestock watering, small scale irrigation, and other beneficial uses. Although clusters of reservoirs store significant quantities of water and effect on downstream flows, they have rarely been considered as systems, with synergies and tradeoffs resulting from their numbers and their density.

Often reservoirs were constructed in a series of projects funded by different agencies, at different times, with little or no coordination among the implementing partners. That a significant number are functioning sub-optimally and/or are falling into disrepair indicates that there is room for improvement in the planning, management, operation, and maintenance of small reservoirs.

This first version of the Small Reservoirs Toolkit was produced by the Small Reservoirs Project. It is a project of the Challenge Program for Water and Food, sponsored by the German Technical Cooperation (Gesellschaft fuer Technische Zusammenarbeit, GTZ), led by the International Water Management Institute (IWMI) with six partners: Empresa Brasileira de Pesquisa Agropecuaria (Embrapa), L'Institute de recherche pour le developement (IRD), Stockholm Environment Institution (SEI), Delft University of Technology (TUD), University of Zimbabwe (UZ), Ghana Water Research Institution (WRI). In 2005 the project began with two paired objectives. The basin/watershed level objective is to promote and support the planning, development, and management of small reservoir ensembles. The local/community level objective is to support use of small multi-purpose reservoirs that are properly located, well designed, well maintained and operated to improve the livelihoods of the local residents. A multi-disciplinary team was assembled to develop a set of tools based on socio-economic and biophysical research. The hydrologic, economic, ecological, health, and institutional dimensions of small reservoirs were considered. By harmonizing the interests of individuals served by small multi-purpose reservoirs and other people living in the basin we will come closer to our paired goals: 1) to maintain water related ecosystem services, the long-term sustainability of local water supplies, and adequate downstream flows as we make use of small reservoirs and 2) to improve food security and increase sustainable livelihoods through the use of those small multi-purpose reservoirs.

There are approximately 30 tools and techniques presented in four topic areas: i) Intervention Planning; ii) Storage and Hydrology; iii) Ecosystems and Health; iv) Institutions and Economics. This tool kit is intended for the use of NGOs, research institutes, universities, donor agencies, multilateral organizations, and government agencies. These tools are not meant to replace other methods of collecting, storing, and presenting knowledge. Information in journal articles, dissertations, theses, and other literature is often difficult to find and is seldom written for use by

practioners. The purpose of the tools is to make information more accessible and more useful to practitioners. In the tools, references are made to the original documents. And it is expected that the reader will refer to and make use of the original documents where necessary.

Some of these tools are simple and applying them requires nothing more than the desire to try something new, and the drive to 'get out and do it'. Undertaking them effectively requires, sometimes advanced, facilitation and communication skills. Here, we have aimed to provide comprehensive accounts of how to apply such techniques, with a focus on the requirements of potential facilitators. Some of the tools are more complex, and call for significant resources if they are to be used effectively. Here, we have attempted to provide an introduction and orientation to the topic at hand, as well as an introduction to resources that might prove useful to the reader. The aim of this toolkit is to present entry points and references to the wide ranged topic of 'Small Reservoirs' and related research. This toolkit is a starting point. Other researchers will make additional contributions as part of the on-going process of expanding our knowledge of small reservoirs. References and contact persons are listed at the end of each tool.