

Small Multi-purpose Reservoir Ensemble Planning



Full title: *Planning and evaluating ensembles of small, multi-purpose reservoirs for the improvement of smallholder livelihoods and food security: tools and procedures*

Participating Institutions

International Water Management Institute (IWMI)
 Center for Development Research (ZEF)
 Direction Générale de l'Inventaire des Ressources Hydrauliques (DGIRH)
 EMBRAPA
 Institut de recherche pour le développement (IRD)
 Stockholm Environmental Institute (SEI)
 Water Research Institute (WRI)
 Universidade Federal de Vicosa (UFV)
 University of Zimbabwe (UZ)

Basins: Volta, Limpopo, and Sao Francisco

Themes Covered

Theme 2 Multiple use of Upper Catchments	25%
Theme 3 Aquatic Ecosystems and Fisheries	15%
Theme 4 Integrated Basin Water Management Systems	50%
Theme 5 Global and National Food and Water System	10%

Project Duration Four Years

Budget requested from CP US\$ 1,460,347

Budget offered as matching funds US\$ 694,190

Total budget US\$ 2,154,537

Background

People living in arid areas with highly variable rainfall, experience droughts and floods and often 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.

The reservoirs are hydrologically linked by the streams that have been dammed. Although reservoir ensembles store a significant quantity of water and have a significant effect on downstream flows, they have rarely been considered as systems, with synergies and tradeoffs resulting from the number and density of their structures.

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, operation, and maintenance of small reservoirs. The water management institutions in Volta, Limpopo, and Sao Francisco Basins are being revamped to better serve their constituencies. We have an opportunity to collaborate with government officials, stakeholders, and farmers who are actively looking for ways to improve the planning process.



Goals

Our goals are: 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 at the household level and increase sustainable livelihoods through the provision of those small multi-purpose reservoirs.

Objectives

To achieve our goals we propose a project with two paired objectives. The basin/watershed level objective is to promote and support the planning, development, and management of small reservoir ensembles. Planning reservoirs at this scale limits conflicts over water, markets, and other resources and minimizes undesirable environmental interactions among the reservoirs. The local/community level objective is to support use of small multi-purpose reservoirs that are properly located, well designed, operated and maintained in sustainable fashion, and economically viable while assuring they improve the livelihoods of the local residents.

Activities

To reach our objectives, we have assembled a multi-disciplinary team to develop two purpose built sets of analytical tools and implementation procedures based on economic and biophysical research. The hydrologic, economic, ecological, health, and institutional dimensions of small reservoirs will be considered. The project team will work with planners, decision makers and farmers in an iterative, consultative process to develop tools appropriate for the use of the stakeholders who will use them. The project will proceed according to the following schedule.



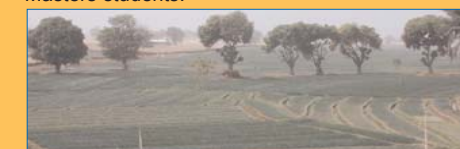
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| Task 1 (Months 1-6) | Mobilize Research Teams & Plan Implementation |
| Task 2 (Months 7-33) | Collect Data and do Small Reservoir Analysis |
| Task 3 (Months 12-42) | Develop Ensemble Management Tools |
| Task 4 (Months 12-42) | Develop Reservoir Management Tools |
| Task 5 (Months 36-48) | Hone Tools and Disseminate Information |

Outputs

The first set of tools will assist stakeholders to site, build, and manage ensembles of small multi-purpose reservoirs. The second set of tools will assist planners and stakeholders, particularly farming families, to develop economically and environmentally sustainable small multi-use reservoirs and institutions for their communities. The toolbox will be comprehensive and include not only the necessary analytical instruments, but also a set of process oriented tools for improved participatory decision making.



The hands on experience gained by the communities, governmental and civil society groups participating in the development of the toolbox will create capacity within the groups responsible for participating in small reservoir development. The project will also support one Ph.D. student and three Masters students.



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