Watershed Management Planning Tool

Haphazard utilization of water catchments in the developing world leads to severe land degradation and loss to ecosystems services vital for supporting humans, animals and biodiversity. Reversing the negative effects of land degradation requires a holistic and integrated approach to land and water management. To address this concern, ICRAF Water Management Unit embarked on developing a tool to aid on characterizing land and water resources with a view to better understand best management options for sustainable conservation of the watersheds. Given this background, the Watershed Management Protocol Application – WAMPA has been unveiled. WAMPA employs a participatory and consultative approach using GIS and remote sensing to attain context-based options for effective management of land and water resources:

Main objectives:

The main objective of WAMPA is to generate sub catchment managements plans to guide implementation of appropriate interventions/options that impact not only on livelihoods but also a lasting effect on watershed and ecosystem functions.

Steps of WAMPA

1. Literature review and data collection
2. GIS based biophysical and socio-economic characterization of selected sub-catchments using WaMPA protocol (See Figure xx).
3. Generation of thematic maps highlighting various issues including water harvesting potentials; flood areas, land degradation trends and drivers; infrastructure – roads; issues hampering economic production and ecosystems functioning of the targeted sub catchments etc.
4. Compute and identify storage and recharge sites, flood zones and erosion hotspots
5. Conduct field visits to validate the observed hotspots and collect soil and water samples for analysis
6. Conduct analysis of erosion and sediment hotspots and discuss these issues with relevant stakeholders to determine corrective measures
7. Develop physiographic maps of the sub-catchments to guide the formulation of the watershed plan
8. To develop catchment management recommendations
9. To produce final synthesis report with target interventions and final physiographic maps for implementation.

Application of WaMPA

The WaMPA has been used for developing several policy and strategy documents including the Irrigation Master plan for Rwanda, the Zanzibar Rainwater Harvesting Master plan, the Physiographic study of Mwache catchment in Kenya, the Food and Water Security Master plan for Turkana County just to mention a few areas of application. The GIS based tool can be customized to compute a wide range of land and water management attributes including rainwater-harvesting potentials, mapping of flood zones, erosion hotspots all based on the current land use and cover and generate through GIS based multi-criteria analysis, thematic maps for improving the watersheds in target areas. The tool employs basic data including Administrative and Infrastructural: (political

subdivisions, roads, electricity); Land and Soils (land use, land cover, geology, lithology, geomorphology, soil types, topographic data); Climate (temperature, precipitation, PET, ACZs); and Water Resources (hydrology, hydrography, hydrogeology).

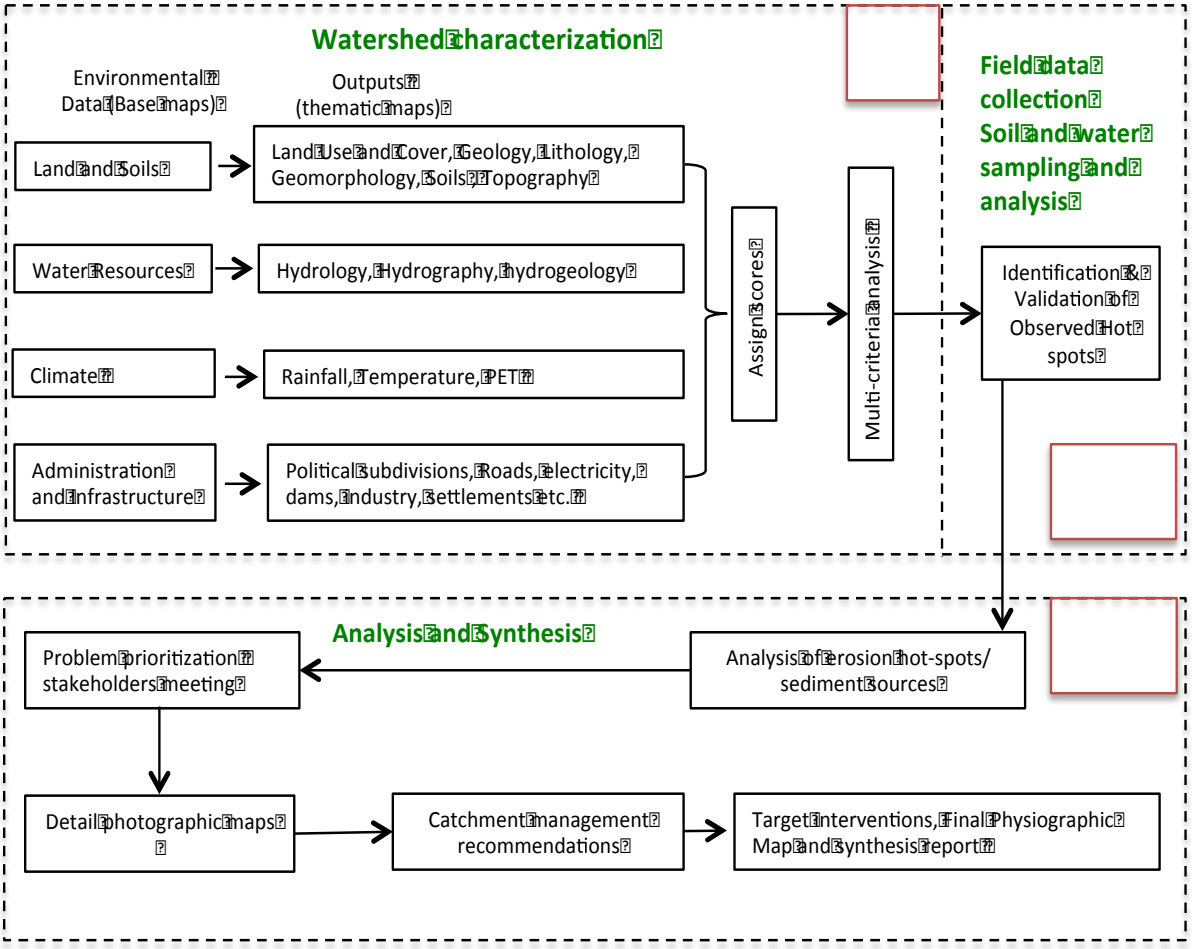

Figure 1: *WAMPA Flow chart depicting the watershed protocol application*

The tool quantifies rainwater harvesting potentials across the mapped landscape or watershed, guiding the land users to locate appropriate sites for capturing and storing the rainwater in-situ or ex-situ. Since the method considers relevant biophysical and socio-economic parameters, the land with the best capability for agriculture production (either crop or livestock) is matched to the available water resources within the landscape/watershed. The tool produces thematic maps showing areas suitable for practicing various rainwater harvesting options such as Zai pits, bench terracing, check dams, farm ponds, dams etc. Any areas undergoing severe land degradation are identified using the *Revised Universal Soil Loss Equation* (RUSLE), the hotspots are then mapped and drivers of such negative land use identified and investigations for corrective measures done. The entire process is undertaken in full consultation of the land users, local authorities and stakeholders. The tool enables communities and local authorities to develop a sub-catchment management plan as a mid-term tool for prioritizing actions on the ground. For wider use of this tool, it is essential to build the capacity of relevant professionals to apply this methodology. Users should

also design and establish learning sites for appropriate rainwater harvesting and accompanying production units.

References:

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