Down to Earth Data:
The role of local soil data in landscape planning for ecosystem services in Tanzania

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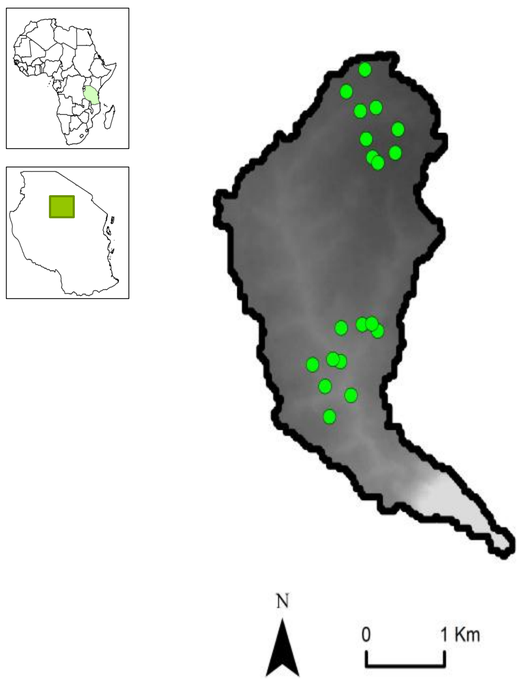
CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems

Ecosystem service assessments to support local decision making on sustainable land management interventions should consider using local datasets in order to make more robust and relevant recommendations.

Babati watershed (9 km^2) in Tanzania with location of soil sampling sites



Soil samples were collected using the Land Degradation Surveillance Framework (LDSF) methodology

In Northern Tanzania, CIAT is working with local communities and decision makers to determine how to sustainably intensify farming systems.

Ecosystem service modelling can help identify what benefits (ecosystem services) people may get from more sustainable systems.

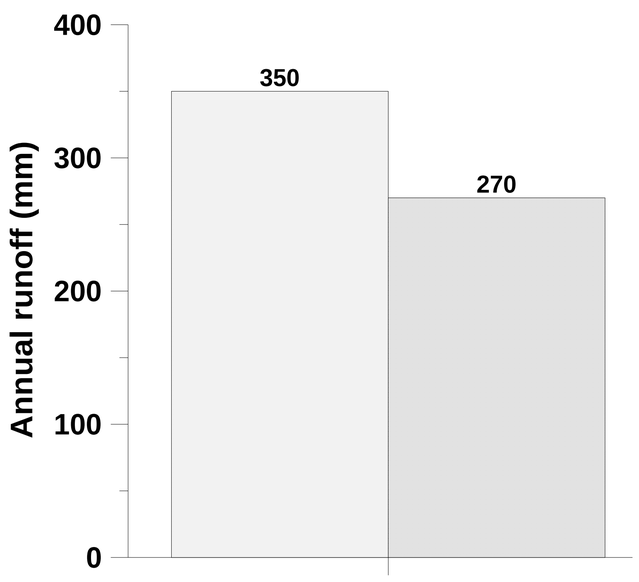
Most ecosystem service modelling tools require land cover and soil data at the very least. Often people use global datasets for such assessments because locally available data is not available.

Global datasets are important sources of information for global, regional and national scale modelling.

However, when local soil data and global soil data (DSMW) are used in the hydrological modelling tool SWAT to model ecosystem services in a small watershed and the results compared, global datasets give lower values of water related services.

Surface runoff

Runoff is the amount of water that flows off the land into streams; it contributes to total water yield.



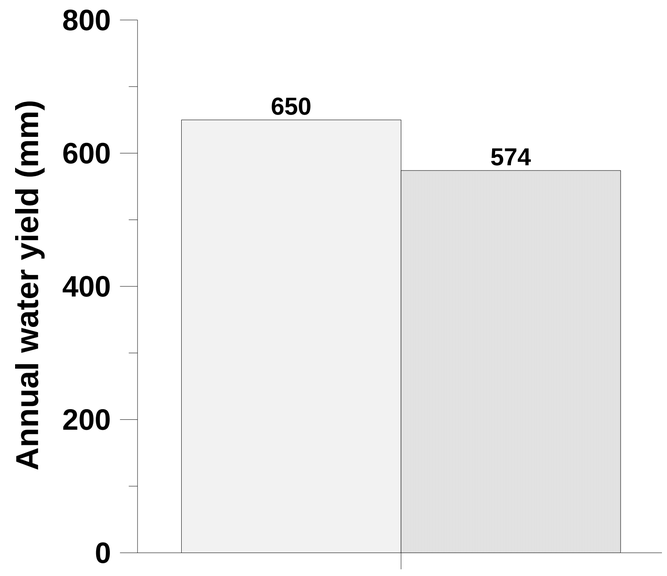
Global datasets underestimated annual runoff by 23%

The severity of the impacts of runoff could be masked by this underestimation

- Soil properties, such as texture, differ between the two datasets resulting in different runoff values
- Higher runoff could indicate lower water infiltration into soil and so poorer soil health, and less water available in streams in the dry season
- Higher runoff can increase soil erosion which could lead to higher sedimentation in streams

Water yield

Water yield is the rainwater that remains after plants have taken up all the water they need; it contributes to groundwater and streams in the watershed.



Global datasets underestimated annual water yield by 12%

- Higher water yield values mean there is more water available in streams
- Higher runoff contributes to higher water yields BUT water quality might be lower because of increased sedimentation
- Underestimating water yield could be detrimental in areas prone to flooding

This data is being used to model how changes in management practices might result in changes in ecosystem services, such as water quality, and identify those practices that will have the most benefits. This information is being shared with local decision makers to **make the case for more sustainable farming practices.**

Photo credits: Juliet Braslow

Our partners
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- *Tanzania* Livestock Research Institute (*TALIRI*)

Africa RISING

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