Enhancing Agricultural Production with Rainwater-Harvesting in Expanding Cities: Practices and Potential in Burkina-Faso and Ghana (West Africa)

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Research Question

Urban Agriculture (UA) and Rainwater-Harvesting (RWH) in Africa

Almost 48.3% of Sub-Saharan Africa's population will be living in urban areas by 2030 associated with increasing food needs and higher market's prices [1]. Local food production within cities and outskirts can be an opportunity to achieve food security in expanding cities. In this context, RWH is an auspicious technology due to the ample availability of suitable catchment areas in urban areas. First, it is an opportunity to use water in a productive and efficient way.

Second, it conserves run-off water and reduces flooding. Additionally water resources are expected to become more scarce due to climate change. The study reports about RWH practices in Ghana and Burkina-Faso and their potential for UA based on lessons learned from the CuveWaters project in Namibia. In this study, it is important to not understand RWH as an isolated practice, but as a part of integrated water resources management (IWRM).

Literature Review

RWH practices in Ghana and Burkina-Faso

More than 20 reports have been consulted. There are currently about 8 different types of RWH practices in Ghana and Burkina-Faso, but most of them are unsuitable for use in urban areas. Currently two types of practices are being used in expanding cities [2,3,4]…

Rainwater Tank (30 m³) for domestic use in Tamale

Water reservoirs for vegetables production in Ouagadougou

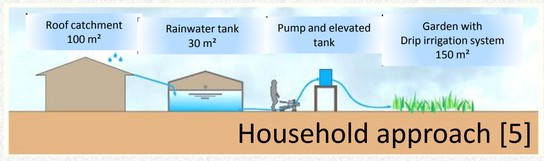
… RWH has been largely adopted in Ghana and Burkina-Faso. However, its potential is still underexploited and few reports exist about its contribution to food production in urban and peri-urban areas. The case-study of Namibia can serve as a basis for a south-south technology transfer.

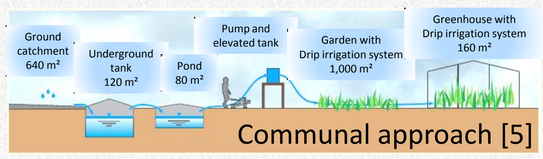
Success story from Namibia

CuveWaters started 2006 as an IWRM project in central-northern Namibia led by ISOE and funded by the German Federal Ministry of Education and Research (BMBF). In cooperation with the Technical University Darmstadt, it adapted and implemented different technologies for water supply and sanitation with a participatory approach [5].

Achievements with RWH [5]
- Ferrocement tanks (30 m³) on the household level and greenhouses with underground tanks (120 m³) and ponds (80 m³) on the communal level are the most economic and sustainable solution
- Availability of good quality rainwater in the dry season for gardening
- People's capacity regarding construction, agriculture and irrigation developed
- Improved diet and health status of families and creation of jobs
- Income generation through the sale of fruit and vegetables: up to N$ 12,000 (N$ 10 ≈ € 1) per year for individual household [5] whereas average expenses in Namibia amount to N$ 1000 – 3000 per year [6]

Isaac with tomatoes inside the greenhouse





CuveWaters Project

South-South Transfer

Potential of and challenges for urban agriculture with Rainwater-Harvesting

Local water buffer capacities

Use water in a productive and efficient way

Food production and food security

Job creation

Knowledge
Knowledge development on sustainable cultivation, health issues, forms of self-organization; knowledge transfer …

Practices
Everyday routines and practices on cultivation, irrigation, efficient use of fertilizers and pesticides, post-harvest management …

Challenges

Institutions
Integrate UA and RWH in national planning and policy processes; legal and financial issues; access to markets …

Technology
Technical adaptation to local demand and conditions; consideration of availability of material; location for piloting …

Outlook

Conclusion and outlook

The case-study of Namibia shows that RWH can contribute to a productive use of water resources in urban areas with benefits to people without compromising ecosystem. There are successful examples in the three countries (Ghana, Burkina-Faso, Namibia), but potentials are still underexploited. A crucial topic, that should be addressed is the dissemination of the technology. For that matter, scientific research and implementation methods adapted to the local demand and conditions are an important prerequisite.

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