

# RAINWATER HARVESTING PRACTICES AND DESIGN OF RAINWATER HARVESTING SYSTEM FOR OTUKPA COMMUNITY, BENUE STATE, NIGERIA



1Onoja S.B; 2Ocheja I.E and 3Isikwue M.O 1,3 Department of Agricultural and Environmental Engineering, University of Agriculture, Makurdi 2Lower Benue River Basin Development Authority, Makurdi  
[samomyonoja@yahoo.com](mailto:samomyonoja@yahoo.com)

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## 1. INTRODUCTION

- Sources of water for general human utilization include surface water, groundwater and lately rainwater harvesting
- Rainwater harvesting is the interception of precipitation for human use close to where it falls before it sinks into the ground
- Domestic Rainwater harvesting (DRWH), is usually taken as roof run-off harvesting for safe human consumption
- DRWH is motivated by exhaustion of surface supplies and the falling levels of aquifers
- In Otukpa community, both surface water supplies and groundwater are not readily available

## 4, RESULTS

Every building in the community had a roof-top rainwater harvesting system in one form or the other, using corrugated iron sheets (Plates 1-3).The harvesting was done using gutters and downpipes (made of local wood, bamboo, folded galvanized iron sheets or PVC pipes), and led into storage containers.



Plate 1



Plate 2



Plate 3

- The storage reservoirs had covers that were however not good enough to protect against contamination from the environment
- The rainwater harvesting system of the community is partial. The proportion of what was harvested to potential yield ranged from 5.06% to 23.05%.
- Bacteriological results indicate that some of the storage points were contaminated while the samples collected directly from rainfall were consistently free from bacteriological presence.

- Based on the relationship  $W = 0.8 \times A \times R$ , an elevated rainwater harvesting system including harvesting surface and storage was designed for 450,000 litres to cater for about 250 people to last the critical months of March, April and May of the year
- The cost of the developing this system was found to be about ₦ 3 million (about € 14,176)
- Peculiarities of the system include well protected storage, possibility to harvest all the rainfall and diversion of the first flush

## Designed elevated rainwater harvesting system

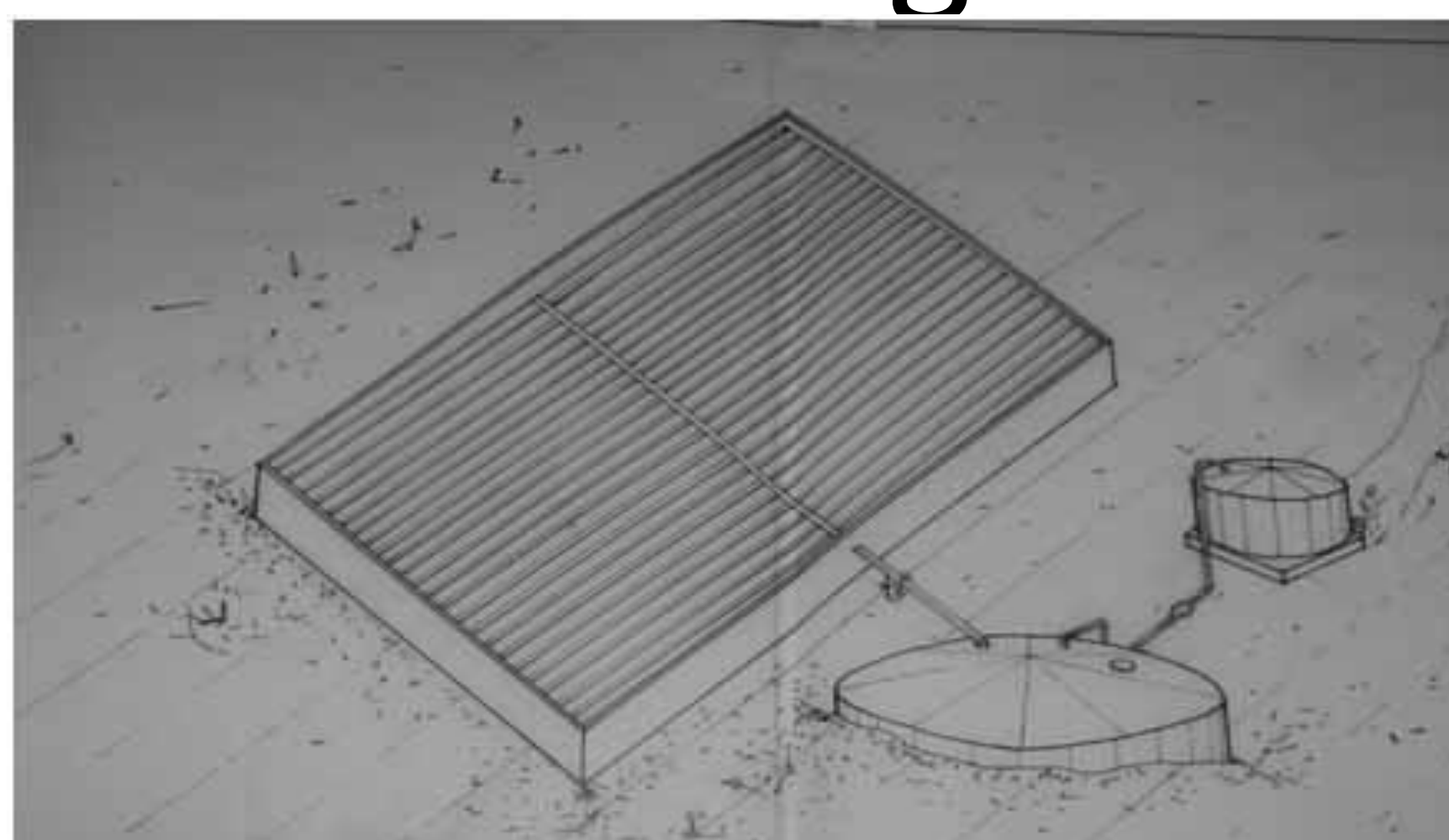


Fig 1: Pictorial view

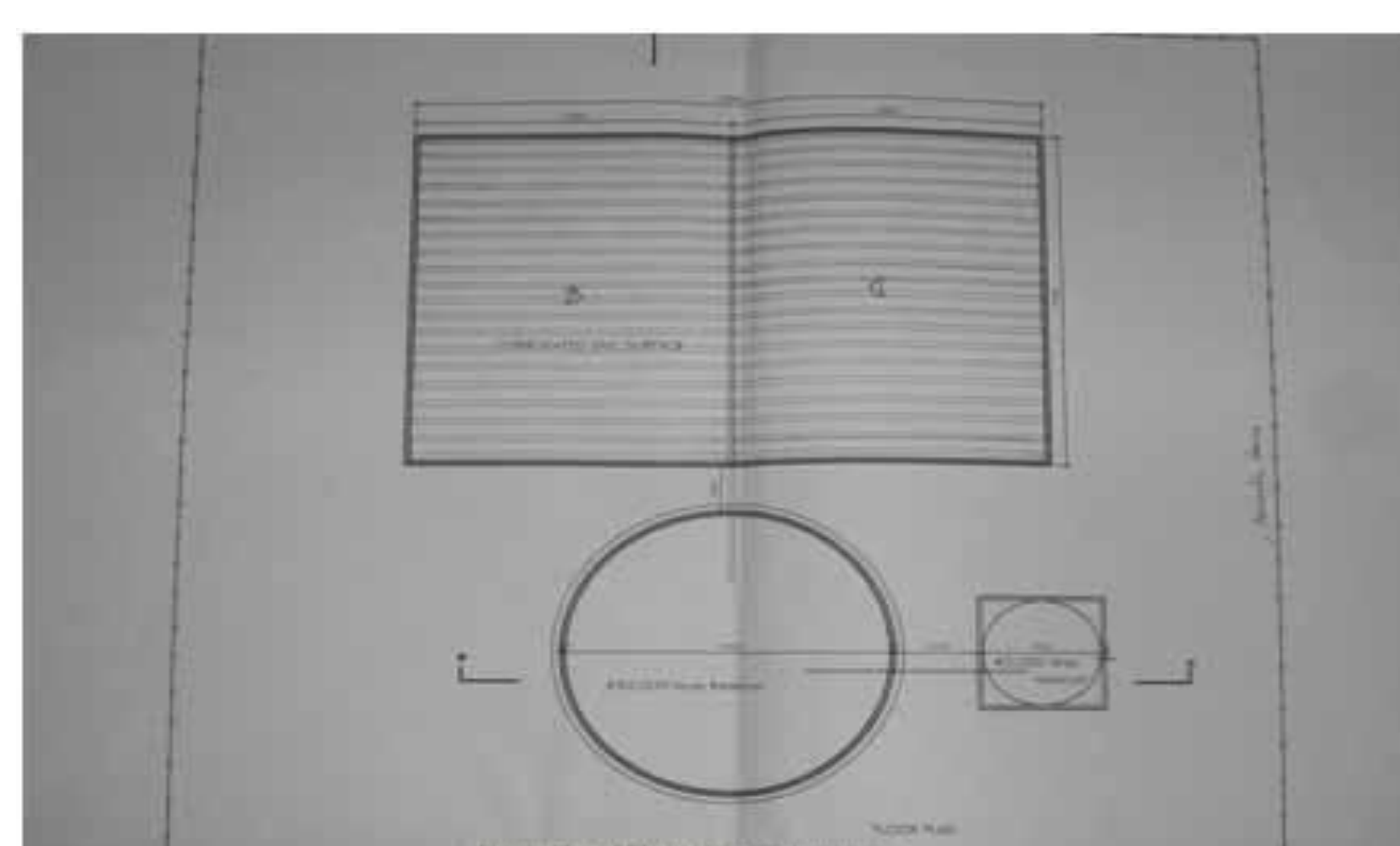


Fig 2: Plan

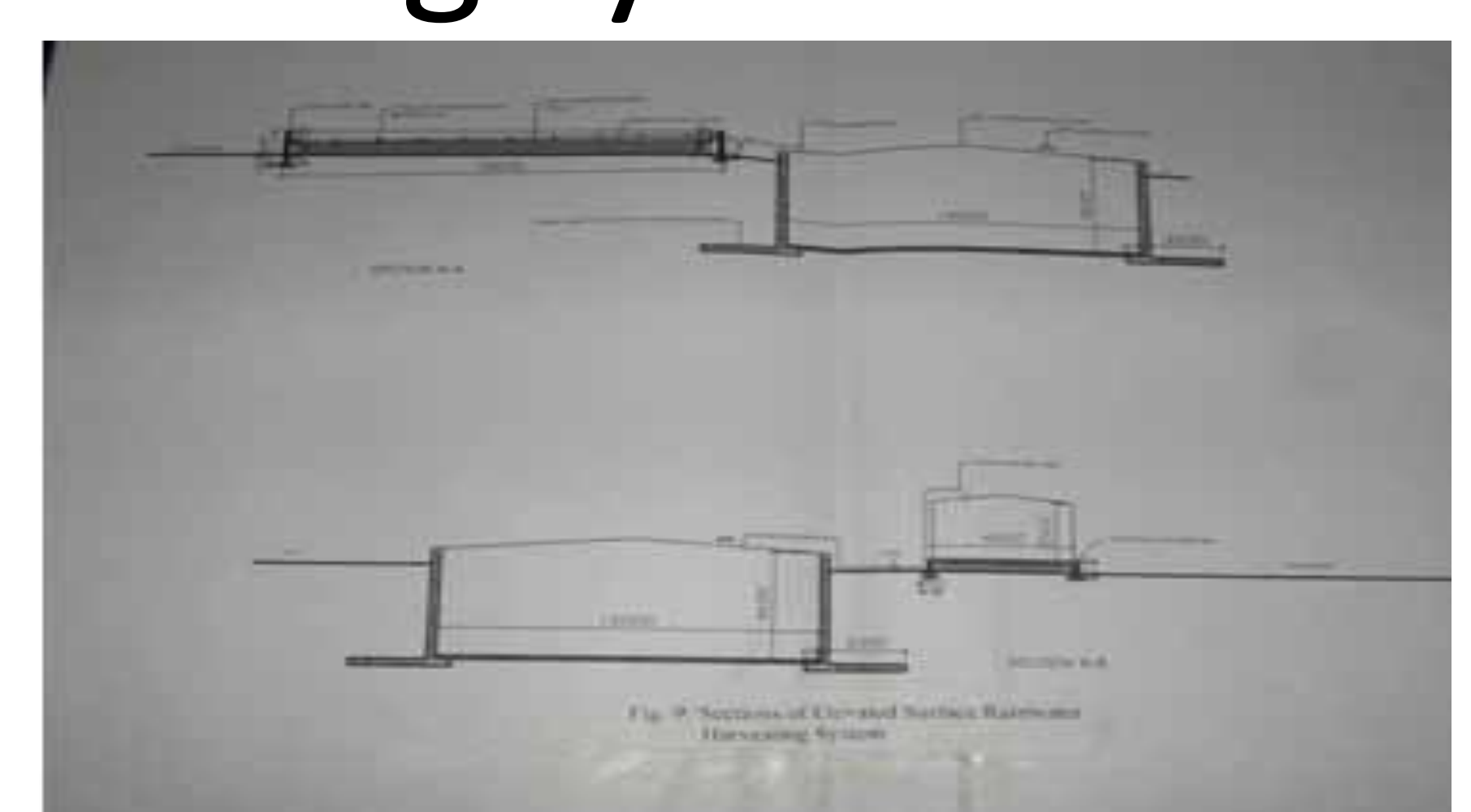


Fig 3: Sections

## 5. CONCLUSIONS

- Rooftop rainwater harvesting is a practice in Otukpa community
- This supply is however unable to sustain them through the dry periods
- An elevated rainwater harvesting system of 450,000 litres, for 250 people with a unit cost of about ₦ 3,000,000.00 was designed for Otukpa
- Governments, NGOs, International and Intergovernmental Organisations and Agencies are hereby called upon to fund these projects as a sustainable development for the community

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