USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Title: Development of Guidelines For Rainwater Catchment Systems In Pohnpei State, Federated States of Micronesia, the State of Hawaii and the U S Virgin Islands

Duration: September 1997-August 1999

Fiscal Year 1997 Federal Funds: $90,000

Non-Federal Funds Allocated: NA

Names, University, and City of Principal Investigators:

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Congressional District of University Performing Research: NA

Statement of the Critical State or Regional Water Problem:

The islands of the Federated States of Micronesia (FSM), while usually blessed with fairly high rainfall rates, continue to suffer from water supply deficiencies due to many factors. Most of the islands are very remote. In virtually all cases each island is completely dependent on locally available resources. These islands are periodically struck by long periods of EI-Nino induced drought. These droughts bring great hardships to those islanders living on the smaller atolls and rural areas of the high islands. They depend almost exclusively on rooftop rainwater catchment systems(RRCS) as their primary source of water. Serious supply problems occur when the components of the RRCS are not sized appropriately. There is a need for easy to criteria for properly sizing the components of a new RRCS or upgrading existing systems. There is also a need for suggestions on how to manage these systems.

Until recently KRCS systems (called cistern systems in the US Virgin Islands) were required by US Virgin Islands law. With annual rainfall averaging about 44 inches, daily per capita demand estimated to be over 50 gallons and steadily rising, and the public water distribution network expected to never reach some areas with rapidly increasing population, cisterns are a principal source of water for domestic usage. Furthermore, even in areas where the distribution network extends, residents of the US Virgin Island very often specify a preference for rainwater for consumptive uses. Cisterns are also prized for the degree of independence from outside control they have and the cistern user's preference for using water of which he is responsible for maintaining its quality. There has been a great deal of interest in the development of guidelines for construction of primary supply and standby cisterns that would be sized according to the rainfall availability in the area, the roof construction material and size, the expected water demand in the house the cistern serves, the cost of constructing the cistern and the degree of reliability the owner desires.

In Hawaii, most RRCS are privately constructed and owned and many of the rules and regulations governing public water supply systems do not apply. In 1994 lawmakers of the 17th Legislature enacted House Concurrent Resolution H. C. R. No. 214 which attempts to provide guidelines for RRCS development in Hawaii. The problem is that the economic impact of these guidelines have not been adequately researched. If construction guidelines are adopted by county planning and building departments, but users cannot afford to follow them and/or water quality standards cannot be met, problems would arise and perhaps conflict between the public and private sectors would widen as a result. On the other hand, if RRCS development guidelines are formulated with sound economic costs analysis to ensure affordability and design considerations to preserve water quality, users would likely be very happy to comply with them.