Net Change: Harvesting Fog for Resilience in Southwest Morocco

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INTRODUCTION:

Dar Si Hmad for Development, Education and Culture (DSH) runs one of the world's largest fog collection systems. After a decade-long experimental phase, the project was officially inaugurated in 2015 and now pipes potable running water into the homes of five rural villages in the Anti-Atlas Mountains of Southwest Morocco. Incorporating from its outset user-centric planning and embracing the interrelation between justice, livelihoods, and sustainability, the fog project serves as a case study for the potential of holistic development.

MAIN RESULTS:

One of the saddest realities of climate change is its unequal impact. Already marginalized communities "bear the brunt of environmental degradation" [1]. Vulnerable populations and fragile landscapes intersect to further jeopardize livelihoods. Recognizing this, Dar Si Hmad's fog project is guided by principles of environmental justice, purposefully integrating gendered and pro-poor analyses to generate maximum impact. On their own, fog collection nets are an innovative technological solution to water stress and the environmental uncertainties wrought by climate change, an ancient idea revitalized for modern demands in fog dense areas [2]. By leveraging the trust built over the course of the project's feasibility study, Dar Si Hmad has built a comprehensive development program delivering not only potable water but also literacy and numeracy support, capacity building, and STEM-based education to some of Morocco's most at-risk villages.

Women hold an ancestral role as water guardians in much of the world. Building from ICCD models linking ICT, climate change, and development [3], Dar Si Hmad created a fog monitoring system valorizing this role. Literacy and numeracy trainings in partner villages enable women to govern household supply via SMS message. Expanded literacy capacities have proven useful for much more than capturing fog data, demonstrating the mutual benefits of engaging beneficiaries in the planning and implementation of development projects [4].

Prior to the fog water inauguration, women in partner villages spent up to four hours collecting water every day. Fog water is creating a *de facto* equality of time between the sexes. To ensure women are able to use the newfound time in ways that benefit them and mitigate the potential negative impacts of alterations to local gender norms, a series of capacity building trainings explored agricultural co-operatives as routes to economic empowerment. Sustainable, locally led businesses further boost resilience as communities have access to multiple income sources.

Complementing adult education is the Water School, a hands-on curriculum engaging area youth around issues of water, sustainability, and conservation. Activities combine art, engineering, science, and math to teach societal and natural realities, equipping rural youth to be makers rather than victims of global change.

Additional spin-off projects include WASH trainings improving community health; the installation of eco-friendly toilets reducing disease and helping retain girls in schools; and a fog water fed reforestation program engaging new stakeholders.

Successfully navigating the water, energy, and climate change nexus requires creative approaches to adaptation and development. Dar Si Hmad's fog harvesting project is one such holistic project that might serve as a pedagogical blueprint for applied resilience projects.

KEYWORDS: fog harvesting; water; sustainable development; women's empowerment; environmental education

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