

## **EFFECTS OF WATER AVAILABILITY ON COFFEE PRODUCTION, FARMER LIVELIHOODS AND ADAPTIVE STRATEGIES**

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The effects of changes in water availability on crop production have been well documented across the globe. In the case of smallholder farmers in tropical regions, water scarcity may have severe effects on their livelihoods, and can drive land use change decisions which can be detrimental to the environment and human populations. Furthermore, when these production systems are located at river headwaters, these effects can be extended along the hydrological basin. Using the case of smallholder coffee farmers of Santa Fe de Veraguas in Central Panama, this study analyzes farmer perceptions of water availability impacts on coffee production, livelihoods, and their socioeconomic vulnerability in relation to potential land use change decisions.

The study addressed experiences and perceptions of farmers affiliated with the “La Esperanza de los Campesinos” agricultural cooperative. Production areas and farmer households were divided according to the perceived water availability: high rainfall, moderate rainfall, and dry zones. Ten households were randomly selected in each one of these three zones to compare results. Key informants were selected using a snow ball sampling technique. Mixed methods included participant observation, semi-structured interviews of key informants, and household surveys.

Compared to the rest of the sample, coffee farmers from dryer areas perceived more severe effects of water scarcity on coffee production (80%), on their livelihoods (80%), and socioeconomic vulnerability (90%) which may drive land use change decisions. Across the sample, 57% of the farmers reported severe impacts from water scarcity on coffee production, 70% reported severe livelihood consequences, and 67% reported severe socioeconomic vulnerability. We recommend that organizations concerned with environmental conservation and livelihoods consider the effects of changes in water availability especially in dry regions, such as in the case of Santa Fe de Veraguas.

**PRESENTER BIO:** Dr. Peralta is a social environmental scientist and practitioner with 20 years of experience with smallholder communities of users of natural resources in the Amazon, and Panama. He is currently a scientific advisor with Ramsar Center CREHO.