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"Solidarity in a competing world — fair use of resources"

Irrigated Family Farming as a Livelihood Potential for Rural Populations in Semi-Arid Northeast Brazil

Heinrich Hagel[1], Reiner Doluschitz[2]

[1] *University of Hohenheim, Food Security Center, Germany*

[2] *University of Hohenheim, Dept. of Computer Applications and Business Management in Agriculture, Germany*

Abstract

In the recent decades, Brazil's government intensified the promotion of irrigated agriculture in the country's semi-arid northeast to combat the negative impacts of severe droughts to the rural population. Since the 1980s, constructions of dams for hydropower generation facilitated constant availability of irrigation water leading to the establishment of several public irrigation schemes along the lower-middle São Francisco River. Despite economic growth in the region, as in the surroundings of the three public irrigation schemes around the Itaparica Reservoir, many smallholders cannot generate sufficient farm income to provide an adequate livelihood to sustain a family. Based on a dataset of 60 expert interviews and 192 farm household interviews, the income distribution between the three public irrigation schemes was analysed. A linear programming (LP) farm optimisation model was developed to identify potential farm incomes, and the optimal allocation of land, water, and labour. The model included two different producer price scenarios and considered local smallholders' farming objectives. Results show a high variability of farm income between the irrigation schemes. Farm income depended rather on appropriate crop choice and availability of irrigable land, than on socio-economic status of the farm household head. Annual high risk and labour-intensive crops were highly competitive towards perennial low risk banana and coconut crops. In general, given a favourable land allocation, a farm size of four hectares could provide an adequate livelihood. Technical assistance, combined with investments in infrastructure to improve the smallholders' access to markets and information, is highly recommended to increase the income opportunities for poorer and often less educated smallholders. Especially improved market access seems crucial to guarantee an adequate farm income on the long-term, considering the extremely low producer prices in the region compared to the national or even northeastern average. Volumetric water pricing may serve as a suitable tool to reduce the excessive consumption in the irrigation schemes. However, smallholders should be compensated for their income losses. Compensations may consist of a monetary part and a non-monetary part such as agricultural consultancy, education, and the improvement of the local infrastructure to increase smallholders' market access.

Keywords: Farm income, irrigated agriculture, linear programming, northeast Brazil

Contact Address: Heinrich Hagel, University of Hohenheim, Food Security Center, 70599 Stuttgart, Germany, e-mail: hagel@uni-hohenheim.de