

Vast areas of Ghana's lowland valleys are currently underused. Could introducing rice production bring much needed profitability to smallholder farmers?

The Opportunity

Inland valleys are low-lying areas, including valley bottoms and floodplains, receiving runoff from hills and mountains. These valleys and adjacent lowlands cover approximately 190 million hectares in sub-Saharan Africa, and are locally referred to as *dambos* in Eastern and Central Africa; *fadamas* in Nigeria and Chad; and *bas-fonds* or *marigots* in Francophone African countries.

Through the use of water capture and delivery structures, the systems are designed to provide supplemental irrigation and improve soil moisture retention. Inland valleys have a high potential for rice cultivation. In Ghana the potential area for inland valley rice production has been estimated at 28,864 ha, and approaches 2 million ha if lowland areas are included.

The Government of Ghana has shown an express interest in revitalizing its domestic rice sector to meet growing demand for the staple crop, mitigate the burden of rice imports on foreign currency reserves, and to contribute to rural poverty reduction and youth employment. Inland valleys are viewed as one possible low cost, high potential option to support these objectives. As a result, several government and donor funded projects are targeting the further development of these areas.



Rice cultivation can thrive in the lowland valley setting.

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LOWLAND VALLEYS IN GHANA

Based on a report by Regassa E. Namara, Lesley Hope and Joseph Awuni¹

The Research

This study was designed to assess current inland valley rice cultivation practices in Ghana—their profitability, potential, and constraints. The study was based on two sample surveys of approximately 500 farmers in the Ashanti and Northern regions, coupled with secondary data from various sources.

The Northern region (Tamale area) was selected as it has a long history of inland valley rice cultivation, while the practice is a relatively newer phenomenon in the Ashanti region, with many of the rice cultivating farmers having migrated from the North and other regions. The two regions also differ in their cropping patterns.

The Ashanti region experiences two distinct rain-fall peaks, allowing for the cultivation of two crops per year, with or without supplementary irrigation. By contrast, the uni-modal rainfall pattern of the Northern region allows for only one crop per year unless farmers have access to full control irrigation facilities.

Main Findings

Labor Requirements

Inland rice farming is traditionally a labor intensive process. From the initial land clearing and management to the subsequent planting, cultivation, harvesting and threshing, a substantial amount of labor is needed (see examples in Box 1). To address this, some labor-saving practices have been introduced by farmers, such as the use of zero till concept for land preparation and the adoption of dibbling and broadcast sowing instead of transplanting.

Socio-economic characteristics

There are discernable differences in the socioeconomic and demographic characteristics of inland valley rice cultivators. The majority of the sampled farmers from the Northern region are illiterate and male. There are very few women heads of household who participate in this type of farming. Land tenure, particularly for migrant farmers in the Ashanti region, is a particular problem. Finally, while farming is the main livelihood strategy in both study regions, on- and off-farm employment is an important, competing factor for scarce labor supplies.

Table 1: Examples of labor requirements for developing inland valleys for rice cultivation

Task (All figures in person days)	Amoakokrom, Ashanti Region 6 farmers, 1.3 ha field	Afari, Northern Region 1 farmer, 1.7 ha field
Land development and preparation	164	197
Water management	148	212
Agronomic practices	74	107
Crop protection	172	117
Harvesting and threshing	187	127
Total Person Days	745	760

Productivity and Profitability

Overall the study found inland valley rice yields to be below potential due to poor agronomic practices, lack of proper land and water management, and various biotic and abiotic stresses including flood damage, drought, weed competition, and pests and diseases. In the Ashanti region, about 32.3% of the sample farmers' plots recorded yield levels less than 2.0 tons/hectare, and 60% recorded yields less than 3.0 tons/hectare. No yield was obtained from about 2.7 percent of the fields. In the Northern region, rice yields in inland valleys with limited water control averaged 2 tons/hectare compared with irrigated rice production, which yielded nearly 3 tons/hectare. Profitability was similarly low for inland valley rice production, with gross margins ranging from GH¢45-80/acre as compared with over GH¢ 160/acre for irrigated rice production in the same region.

Key Constraints

In addition to issues related to water management, agronomic practices, land tenure and labor supply, the study highlighted several additional constraints limiting the production potential of inland valley systems including:

Access to affordable technologies, such as power tillers and mechanical harvesters. Basic mechanized technologies are needed to reduce labor requirements and minimize crop losses resulting from manual harvesting methods.

Access to affordable financing: This is a general problem observed in rural Ghana, where credit services are expensive to access. The lack of financing options constrains farmers' ability to invest in yield boosting inputs, such as fertilizers and other

agro-chemicals, farm equipment and improved seed varieties.

Poor soil fertility: This is a particular problem in the Northern region, where considerable soil nutrient mining and land degradation is evident. Within this context, **improved rice varieties** are also needed that more effectively respond to fertilizers and other inputs as well as resist pests and disease.

Lack of access to information and extension services: In general, farmer contact with extension agents is limited to 1-2 times per season. More specifically, nearly one-third, of the farmers surveyed in the Northern region indicated that they had not received any form of training on rice farming practices.

Solutions

Given the low levels of productivity and profitability together with competing on- and off-farm employment options, inland valley rice cultivation is not likely to be a farmer's preferred option unless these issues can be addressed.

Possible solutions include:

- **Improve water management.** In the Northern region, the water management infrastructure should focus on full control irrigation to allow dry season cropping. In Ashanti, improvements in water management infrastructure should focus on providing supplementary irrigation during the region's two rainy seasons.
- **Ensure the tenure security** by instituting proper tenancy agreements.
- **Improve agronomic recommendations** (fertilizer rates, variety choice, etc.) based on site specific on-farm experiments and applying technical as well as economic criteria.
- **Institute affordable, long-term financing mechanisms** for input procurements and investment that takes into consideration the economic viability of inland valley rice cultivation.
- **Introduce mechanical threshers** to improve the handling of crops after harvest.
- **Improve the land management capability** of the farmers by introducing affordable equipment, such as power tillers.
- **Provide training** for researchers, extension personnel, and farmers in appropriate agronomic practices for inland valley rice farming.

Questions for Discussion

- *What are the interventions required to improve the quality of rice produced in inland valleys so that it can compete with imported rice? Improving productivity alone is not enough.*
- *How to mitigate the negative effect of land tenure insecurity on inland valley rice development?*

These findings and recommendations are preliminary and are reproduced here for the purposes of discussion. The AgWater Solutions Project welcomes all comments and suggestions. These should be directed to AWMSolutions@cgiar.org, please write "Ghana" in the subject line.