



Sustainable rice production in the face of climate emergency

Africa Rice Center (AfricaRice) – Annual Report 2018

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About Africa Rice Center (AfricaRice)

AfricaRice is a leading pan-African research organization working to contribute to poverty alleviation and food security in Africa through research, development and partnership activities. AfricaRice is a CGIAR Research Center — part of a global research partnership for a food-secure future. It is also an intergovernmental association of African member countries. The Center was created in 1971 by 11 African countries. Today its membership comprises 27 countries, covering West, Central, East and North African regions, namely Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of Congo, Egypt, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Madagascar, Mali, Mauritania, Mozambique, Niger, Nigeria, Republic of Congo, Rwanda, Senegal, Sierra Leone, Togo and Uganda. AfricaRice headquarters is based in Côte d'Ivoire. Staff members are located in Côte d'Ivoire and also in AfricaRice research stations in Liberia, Madagascar, Nigeria, and Senegal. For more information, visit www.AfricaRice.org

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Research and innovation highlights

Impact of the Smart-valleys approach in West Africa

The Smart-valleys approach was introduced in Benin and Togo in 2010 to improve water control and soil fertility management, and increase rice productivity in the context of climate change. Smart-valleys is a participatory, low-cost and easy-to-replicate water and land management system for rice production.¹ Outscaling began in the two countries in 2012.

By 2014, about 1486 inland-valley farmers (818 women) in the project areas had adopted Smart-valleys, building and maintaining their own drainage canals, irrigation infrastructure (where enough water was available), and bunded and leveled rice fields on 474 ha (*see image*). In 2016, AfricaRice assessed the adoption, diffusion and the impact of the approach in Benin and Togo. Data were collected from 590 rice-farming households.



Map showing the tracking of Smart-valleys in Zoungo, Benin – non-selection of road and housing indicates the validity of the method

Five factors drive adoption: (1) availability of inland-valley land; (2) total land area available; (3) land tenure security; (4) the market price of paddy; and (5) membership of a farmers' association. While the first four were positively correlated with adoption, the fifth, surprisingly, showed a reverse relationship: members of a farmers' association were less likely to adopt Smart-valleys. The lead researcher suggests that this may be the result of 'elite capture', with trained lead farmers not passing on their knowledge to others in their associations.

On average, adoption enabled producers to increase yields by 0.92 tonnes per hectare (0.88 t/ha for women), net income by US\$ 267/ha (\$198/ha for women). The food consumption score indicates that adoption helps women to increase food security more compared to men.²

Widescale diffusion of and direct training of individual farmers on the approach would likely help smallholder rice farmers to adapt to the climate change and improve their livelihoods. To ensure sustainability and widescale adoption of Smart-valleys, training on site selection, construction of irrigation canals and tiller use will need to be promoted. Training on the use of inputs and marketing, and access to input and output markets will help achieve greater impact.

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1. See 'Out-scaling Smart-valleys to boost rice productivity', *AfricaRice annual report 2016*, pages 15–16.
2. See 'For more details and more results, see Arouna A and Akpa KAA. 2019. Water management technology for adaptation to climate change in rice production: Evidence of Smart-valley approach in West Africa. In: Sarkar A, Sensarma S and van Loon G eds. *Sustainable solutions for food security*. Springer, Cham. doi:10.1007/978-3-319-77878-5_11.