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Mali

WATER-WISE

Smart Irrigation Strategies for Africa

Mali has a long tradition of irrigation due to strong institutional and programmatic innovations to both improve and expand irrigation levels. The active involvement of the private sector and the important role of small-scale, farmer-led schemes have contributed to irrigation uptake in the country. Compared to other countries in West Africa, Mali's irrigation capacities have advanced substantially, with nearly 6 percent of arable land currently equipped for irrigation.[1] **Mali also has considerable potential to expand land under irrigation, estimated at 0.19 million hectares (ha) for large-scale irrigation, with an internal rate of return (IRR) of 10 percent, while the potential for small-scale irrigation expansion is 0.3 million ha, with a much higher expected IRR (60 percent).[2]** Irrigated agriculture contributes significantly to the Malian agricultural gross domestic product. This achievement is largely due to institutional and programmatic commitments for increasing irrigation uptake. Despite this, the 2018 Biennial Review Report by the African Union revealed that Mali is not on track to meet Malabo Commitment area #3.1, "Access to agriculture inputs and technologies," given its score of 4.56 out of 10, which falls below the 2017 minimum score of 5.53.[3]

INSTITUTIONAL INNOVATIONS

In 1993, the Government of Mali created nine regional Chambers of Agriculture, public institutions with legal status and financial autonomy, and coordinated at the national level by the Permanent Assembly of Malian Agricultural Chambers (APCAM). APCAM represents those stakeholders working in agriculture, including irrigated agriculture, to public authorities and participates in the design and implementation of rural development policies and programs. APCAM participates

in most agricultural policy discussions at the national and regional levels, with the issues discussed ranging from land tenure reform to irrigation expansion. APCAM also provides farmers and their professional organizations with the necessary support and skills to ensure their own development. It is composed of nine autonomous and decentralized Regional Chambers of Agriculture and a Permanent Assembly.[4] In 2005, a division to lead hydro-agricultural development was created as part of the National Directorate of Rural Engineering (DNGR) within the Ministry of Agriculture.

The division is responsible for developing a national strategy on access to water for agricultural use, as well as creating plans, programs, and projects for its implementation, especially with regard to irrigation and other agricultural infrastructure and technologies.[5] Through regional directorates and subregional services the DNGR monitors and ensures the effectiveness of its programs on the ground.[6] Moreover, in 2015 the government established the Agency for Land Management and Supply of Irrigation Water (ATI), an autonomous entity that works closely with government services. ATI mobilizes public and private funding for the purchase and application of irrigation equipment, supported with maintenance services. ATI recovers part of the investment costs from producers, who pay for the requested services for use in future investments.[7]

POLICY AND PROGRAMMATIC INTERVENTIONS

In Mali, irrigation policies have long been anchored within national sectoral policies. As part of the 1992 Rural Development Plan (SDDR), a strategy for expanding irrigation systems and a rural infrastructure was partly implemented. In 1997, following adoption of the Accelerated Growth Strategy, programs for boosting the level of crop production under irrigation were implemented. In addition, under the 1998 Poverty Reduction Strategy, a framework for management of irrigated land was established and development of small-scale irrigation and hydro-agriculture promoted. In the same context, under the National Environmental Protection Policy of 1998, the focus of irrigation was on promotion of sustainable agricultural production systems and environmentally sustainable farming methods.[8] In 1999, the government adopted the National Strategy for Irrigation Development (SNDI), the main framework for implementation of

irrigation programs and actions. The SNDI considered irrigation as one of the most effective means of ensuring food security and nutrition, reducing imports, increasing rural incomes, and limiting emigration from rural areas.[9] Furthermore, in 2017, the Government of Mali passed a law that requires a minimum of 15 percent of irrigated lands to be allocated to women and youth under government irrigation land development programs.[10]

Investment in irrigation in Mali dates prior to independence, with the creation of the Niger Office (ON) in 1932, a large-scale irrigation scheme in what is now the Ségou Region. Management of the scheme – the largest in West Africa – was taken over by the Government of Mali in 1960 and it now operates as a semi-autonomous government agency. Despite the potential for expansion of irrigable land, only 120,000 ha are currently cultivated by smallholders, mainly for rice and sugarcane production. To further expand irrigated area, the Government of Mali mandated ON to provide plots of land already equipped for irrigation (also financed by the government) to smallholder farmers who hold a land use permit. Investors who hold a land lease are assisted by ON to develop land for irrigation. Many investors have acquired a land lease, as the government regards private investment as an opportunity to develop and modernize its irrigated agriculture. In 2010, more than 770,000 ha were attributed to investors.[11]

Furthermore, ON is in charge of providing extension services, including information/knowledge on operating and maintaining irrigation systems to farmers for a fee.[12]

Between 2009 and 2012, the ON scheme received additional government and international support to expand the land under irrigation by 4,940 ha in the Alatona zone. The project aimed at facilitating access to technologies for irrigation, access to loans and investments on land, and income-generating activities for women while improving farm yields, crop revenue and household incomes. Close to 1,000 households were allocated 5 ha of developed land each, as well as training on rights and obligations; they also received extension services to improve farming and business skills and to create farmers' associations. Not only did farmers receive funds for an initial deposit into a microfinance institution, they also learned how to secure further loans. At the same time, local financial institutions were trained on how to track loan repayments. Seeds and other inputs were provided to farmers to begin cultivating the land. Agricultural production reached an estimated 15 metric tons per farmer on 5 ha, a 10-fold increase over non-beneficiaries, who averaged 5 tons on 5 ha.[13]

Under the Program for Increasing Agricultural Productivity in Mali (PAPAM), started in 2011, irrigation infrastructure was developed as a means to cope with the adverse impacts of climate change. This was

complemented with the provision of additional environmentally friendly technologies such as biogas digesters and solar energy systems through a subprogram of PAPAM in the southern regions of Kayes and Sikasso.[14] The overall program developed 2,805 ha and 104 market gardening schemes for small-scale irrigation, benefitting 6,375 farmers, 10 of which are equipped with solar pumps and 94 with manual water extraction.[15]

Since 2012, the government has been implementing the National Program of Irrigation of Proximity (PNIP) in Sikasso, Koulikoro, Pays Dogon, and the Delta Intérieur du Niger to improve overall food security in these regions. The program seeks to develop irrigation infrastructure, including micro dams, for supplemental water supply during periods of insufficient rainfall or drought. The small irrigation dams store rainwater in retention ponds that can be used to irrigate farm lands and extend the growing season. The additional access to water may also be used for fish production, livestock watering, and vegetable gardening to diversify livelihoods and improve the nutrition status of those communities. It is estimated that by 2021 the PNIP will increase land under irrigation by 126,000 ha and benefit up to 3 million people.[16]

A study in northern Mali showed that investment in small-scale irrigation not only improves household consumption and production, and hence nutrition, but also leads to an increase in assets and incomes. More importantly, driven by the increased production and household consumption, irrigation investment induces households to save more and share more within their villages, which is a type of investment in informal social insurance. Irrigation investments therefore offer "spillover gains," both at household and community level, outside of the requisite productivity gains.[17] The return on investment of irrigation systems in Mali varies; for example, rice yields usually lie between 4–6 tons with full water control, while free flooding does not yield more than 1 ton, and controlled flooding stands between 1–2 tons.

Mali has a long tradition of irrigation due to strong institutional and programmatic innovations to both improve and expand irrigation levels. The active involvement of the private sector contributed to irrigation uptake. In addition, small-scale, farmer-led irrigation is gaining importance in the irrigation policy process. Although the government increased investments in the expansion of land under irrigation, to date only a small share of the country's land potential has been tapped.

Preferred citation: Malabo Montpellier Panel (2018). Water-Wise: Smart Irrigation Strategies for Africa: Mali. Dakar. December 2018.

1 FAO, 2018. FAOSTAT. Food and Agriculture Organization of the United Nations FAOSTAT. http://www.fao.org/faostat/en/#data/EL
2 L. You, C. Ringler, U. Wood-Sichra, R. Robertson, S. Wood, T. Zhu, G. Nelson, Z. Guo, Y. Sun. 2011. What is the irrigation potential for Africa? A combined biophysical and socioeconomic approach. Food Policy, 36:770-782. https://www.sciencedirect.com/science/article/abs/pii/S030691921100114X
3 AU (African Union). 2018. Inaugural Biennial Review Report of the African Union Commission on the Implementation of the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared prosperity and Improved Livelihoods. http://www.donorplatform.org/news-caadp/au-summit-1st-biennial-review-on-the-status-of-agriculture-in-africa-triggers-unique-momentum-249.html
4 Assemblée Permanente des Chambres d'Agriculture du Mali. Accessed 14 November 2018. https://www.upadi-agri.org/assemblee-permanente-des-chambres-dagriculture-du-mali-apcam/
5 Direction Nationale du Génie Rural. 2014. Rapport annuel 2014. Ministère de l'Agriculture du Mali. http://mali.countrystat.org/fileadmin/user_upload/countrystat_fenix/congo/docs/DNGR%20rapport%20annuel%202014.pdf
6 Ibid.
7 Agence d'Aménagement des Terres et de fourniture de l'eau d'Irrigation (ATI). Accessed 14 november 2018. http://atimali.ml/presentation
8 Ministère du Développement Rural et de l'Eau. 1999. Stratégie nationale De développement de l'irrigation. Document de stratégie sous-sectorielle sur le développement de l'irrigation au Mali. http://www.passip.org/passip_intranet/pdf-intranet/Politique/9-64%20Strategie_Nationale_D%C3%A9veloppement_Irrigation_1999.pdf
9 Direction Nationale du Génie Rural. 2016. Expériences en matière d'irrigation du Mali. République du Mali. http://www.dngr.gouv.ml/pdf/Bonnes-Pratiques-en-Irrigation-au-Mali.pdf
10 One. YES! Malian women make progress in fight for land rights. Accessed 14 November 14, 2018. https://www.one.org/international/blog/malian-women-fight-for-land-rights/
11 A. Adamczewski, J.Y. Jamin, P. Burnod, E.H. Boutout Ly, J.P. Tonneau. 2013. Terre, eau et capitaux : investissements ou accaparements fonciers à l'Office du Niger ? Cahiers Agricultures, 22 (1) : p. 22-32. http://publications.cirad.fr/une_notice.php?dk=567662
12 World Bank. 2017. Commercial Irrigated Agriculture Development Project. Report No: PIDISDSC17562. Washington DC: The World bank. http://documents.worldbank.org/curated/en/265781506532233318/pdf/ITM00184-P159765-09-27-2017-1506532229268.pdf
13 Millennium Challenge Corporation. Measuring Results of the Alatona Irrigation Project in Mali. Accessed 14 November 2018. https://www.mcc.gov/resources/doc/summary-measuring-results-of-the-alatona-irrigation-project-in-mali
14 Agence de l'Environnement et du Développement Durable. ASAP PAPAM. Accessed 14 November 2018 http://aedd.gouv.ml/asap-papam/
15 Mali7. Agriculture : Le Projet PAPAM arrive à son terme. Accessed 14 November 2018. https://mali7.net/2018/01/23/agriculture-le-projet-papam-arrive-a-son-terme/
16 USAID. 2016. Mali small-scale irrigation project. Fact Sheet. Bamako Mali. https://2012-2017.usaid.gov/sites/default/files/documents/1860/USAID%20AEG%20-%20KfW%20Irrigation%20Fact%20Sheet%20-%20FTF%20-%20Nov%20%2716_FINAL.pdf
17 A. Dillon. 2011. The Effect of Irrigation on Poverty Reduction, Asset Accumulation, and Informal Insurance: Evidence from Northern Mali. World Development, 39:2165-2175. https://www.sciencedirect.com/science/article/abs/pii/S0305750X11000763