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Africa-wide Rice Agronomy Task Force: Achievements and Lessons Learnt on Enhancing On-farm Rice Productivity in Sub-saharan Africa

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Abstract

The Africa Rice Center (AfricaRice) and national agricultural research institutes (NARIs) established the Africa-wide Rice Agronomy Task Force in November 2011. The Task Force involves 21 countries covering diverse agro-ecological zones. Major objectives of this Task Force were to (i) quantify yield gaps and identify their causes, (ii) validate new technologies to be components of good agricultural practices (GAPs), and (iii) test a set of GAPs including farmers' decision support tool RiceAdvice. We describe the approach, achievements and lessons learnt through this Task Force from 2012 to 2017. All studies were conducted in farmers' fields in strategic R&D sites called "Rice Sector Development Hubs" (short: hubs). Standardized protocols were developed by AfricaRice together with NARIs, and Open Data Kit was used for data collection and submission. Research activities included yield gap surveys, nutrient omission trials with focus on NPK, participatory selection of mechanical weeders, and farmer-led testing of GAPs. Technologies such as land preparation, varietal choice, crop establishment, nutrient and weed management options, were the main GAP components. In total, more than 5000 farmers were involved in these research activities. Mean on-farm rice yields were 4.0, 2.6 and 1.6 t/ha with yield gap ranges of 1.3–3.3, 0.6–4.5 and 0.7–3.3 t/ha for irrigated lowland, rainfed lowland, and rainfed upland conditions, respectively. Rice yield levels differed between agro-ecological zones with highest yields in semi-arid conditions for irrigated lowland, and in highlands for rainfed lowlands and uplands. High yields were associated with N application, frequent weeding, certified seeds, and bunding and leveling of fields. Nutrient omission trials showed that nitrogen is the most-limiting nutrient, followed by phosphorus irrespective of production system or agro-ecological zone. Farmers' preference of mechanical weeders differed across countries (e.g. ring hoe in Benin, curved-spike weeder in Tanzania). Combined GAPs increased the yield by 1 t/ha on average. The Task Force enabled to test and validate agricultural technologies at a regional scale in SSA, showing that there is large scope for

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improving rice productivity in SSA. Scaling of technologies will require establishment of effective links between public and private sector partners beyond the current Task Force partnership.

Keywords: Farmer, partnership, research for development, research network