

## MADE IN AFRICA

### How to make local agricultural machinery manufacturing thrive?

Manufacturing can play a key role in sustained economic growth, job creation, and poverty reduction in Africa. Agricultural machinery manufacturing can contribute to driving overall manufacturing, given the increasing demand for mechanization from Africa’s 85 million farms and the rapidly growing agro-food processing sector. But while agricultural mechanization creates large opportunities for manufacturing, harnessing this potential in today’s globalized world requires African manufacturers to compete with (low-cost) imports from today’s manufacturing powerhouses such as India and China.

This policy brief presents insights from a study on the characteristics, opportunities, and challenges for local agricultural machinery manufacturers in four African countries, Benin, Kenya, Mali, and Nigeria. The policy brief is based on a survey among ca. 400 randomly chosen manufacturers which assessed business characteristics and opportunities and challenges. The survey was supplemented with qualitative methods (participatory mapping, key-informant interviews) to examine key factors and actors affecting the enabling business environment of local manufacturing – and to derive policy recommendations on how to make local agricultural machinery manufacturing thrive.

#### Business Characteristics

**Markets for local machinery have emerged in all four African countries, driven by small but dedicated entrepreneurs.** The majority of manufacturers were founded in the in the 2010s (see Fig. 1). Most Smanufacturers are motivated to pursue their profession because of aspiration (65%) or family tradition (24%). 65% of the manufacturers are formally registered.

**Agricultural manufacturers mostly produce machinery for crop production and post-harvest handling (44%) and crop processing (24%).** Many also produce machinery for livestock production, construction, and transportation. In Kenya, which

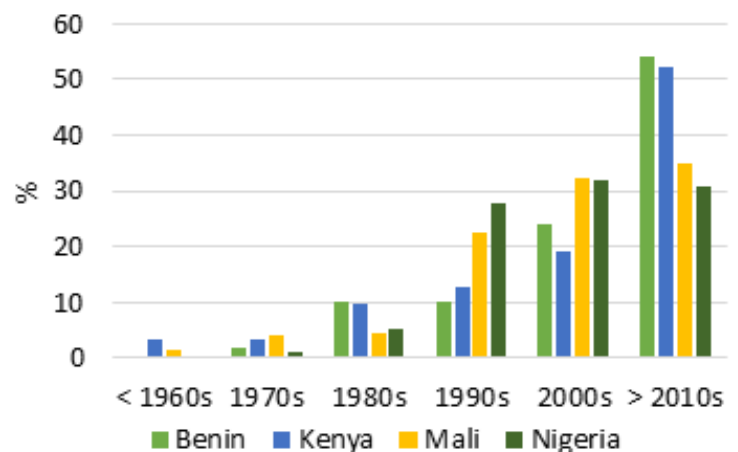


Figure 1. Year of foundation.

has significant meat and dairy industries, 27% of the machinery is for the livestock sector. An average manufacturer produces 17 threshers or shellers, 13 mills, 12 tractor attachments for land preparation (e.g., plows, harrows, or rippers), and some other products such as choppers and carts per year. 14% of all manufacturers produce machinery that can be powered with renewable energy, in particular pumps and dryers.

**The large majority of manufacturer produce machines entirely or partially on demand.** 58% of the manufacturers produce only on-demand, and 29% produce both on-demand and regularly. The main reasons for this business model were market risks (61%), lack of capital (56%) and the ability to customize machinery to customers’ preferences (36%). The downside of on-demand production is that it reduces production efficiency and raises costs vis-à-vis importers, who typically produce using an assembly line production system. Further, customers must wait for their machinery to be produced and delivered. Customers also typically need to make a down payment before the actual production begins,



in particular in the case of larger and motorized equipment. For customers, this constitutes a risk as they cannot see the final product yet, unlike when purchasing imported machinery. The risk is exacerbated as only 27% of all manufacturers are subject to some kind of third-party testing.

**Education levels of manufacturers differed between the four countries.** In Benin and Mali, most manufacturers have no formal education or only primary education. In Kenya and Nigeria, there is a much higher share of manufacturers with secondary education and university degrees. However, across all countries, only 38% have participated in any type of business training, which may explain why only 44% of businesses use accounting systems. The high share of manufacturers who own farmland (70%) is noteworthy, suggesting a strong familiarity with the needs of local agriculture. Manufacturers have 8 employees on average. Almost three-quarters (71%) provide “on-the-job”-training, which typically lasts around three years. Only in 37% of the cases, this is part of a more formal collaboration with vocational training centers, while in the other cases, trainees are only trained by the manufacturers themselves.

### Characteristics of the business environments

**An enabling business environment is key to the success of local agricultural manufacturers.** While the

manufacturers highlighted various positive aspects related to the business environment, the results also show that manufacturers face a range of challenges related to production factors such as finance, human resources, utilities (i.e., electricity), and public research and development, among others, as well as challenges related to the overall regulatory environment.

**Access to finance is essential for manufacturers to overcome their capital constraints, and it is also important for other actors such as suppliers and customers.** However, access to finance is a challenge for manufacturers (see also Fig. 2). Only 26% of all manufacturers sampled in the four countries applied for formal credit in the last three years. As reasons for not applying for formal credit, manufacturers cited tedious application processes, preferences for other sources, perceived lack of success chances, and strict repayment schedules, among others (such as lacking interest and fears of becoming indebted). Of those that did apply for formal credits, the vast majority (87%) received the credits, but only those with high chances bothered to apply.

**Human resources are another key factor for scaling local manufacturing.** While labour is generally available, knowledge and skills can be limited. On average, manufacturers are relatively satisfied with the knowledge and skills of trained job market entrants. Only 26% stated that they were “not really” or “not at

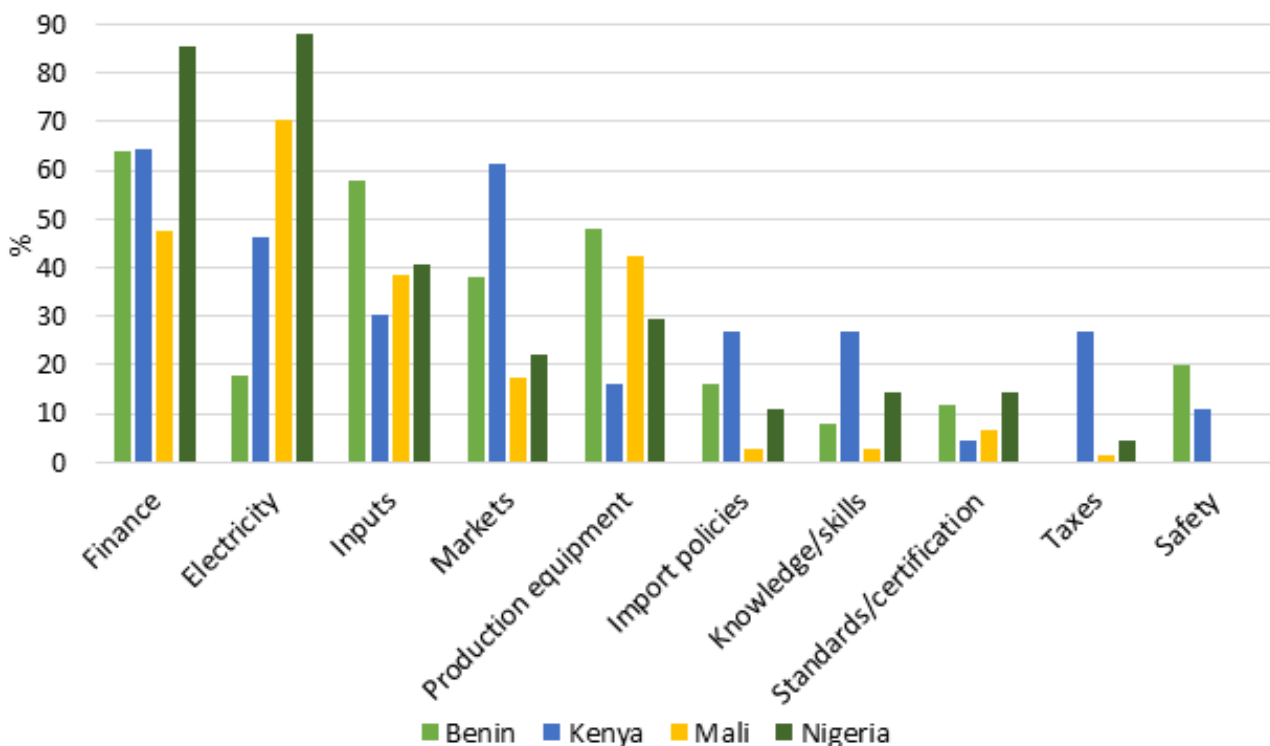


Figure 2. Top 10 business constraints as perceived by manufacturers.



all” satisfied (Benin stands out with 64% dissatisfaction). However, the participatory mapping exercises and key-informant interviews point toward more serious problems related to knowledge and skills development - both among employees and among manufacturers themselves. Informal on-the-job training is popular in all countries, however, it is mostly not combined with training at vocational centers and some such centers have outdated curricula and their courses were perceived as too theory-heavy.

**Utilities, notably related to transportation and electricity, were identified as key bottlenecks.** In many countries, transportation infrastructure is poor, raising the costs of production and undermining the marketing of products over longer distances and abroad. Moreover, particularly in Mali and Nigeria, electricity is not only costly but also unreliable, which can heavily undermine production processes. Some manufacturers use generators to become independent from the public electricity grid, but this raises the costs of production.

**In all countries, the research system was identified as key for the success of local manufacturers.** Research is necessary to develop locally adopted engineering solutions. Developing locally adapted machinery has been identified as a potentially large comparative advantage for local manufacturers, however, these opportunities are not fully harnessed in countries where the public research system was weak. In all countries, the research system was said to be poorly funded and to struggle to follow the latest technological developments such as those related to renewable energy and digitalization.

**The regulatory environment also matters.** In the absence of impartial third-party testing and certification, it is difficult for customers to choose reliable machinery. Instead, they may resort to suboptimal heuristics for decision making (e.g., rules of thumb) such as always choosing foreign over domestic products regardless of their actual quality. Few manufacturers sell to customers from outside their regions (17%) or other countries (2%), even if they have similar agroecological conditions, which key-informants attributed to infrastructure problems, high transaction costs, and unfavourable trade policies and practices. In some cases, local manufacturers were also disadvantaged because finished products come with lower import duties and taxes as compared to raw materials needed for local manufacturers. Moreover, government and development projects often favour imports even if they are more expensive because importers can deliver larger quantities in a shorter time.

**Despite these challenges, local manufacturers were typically very confident that they have a comparative advantage vis-à-vis importers.** This was also mirrored during interviews with potential customers, including farmers and food and beverage processors). One aspect that was frequently highlighted as a comparative advantage was the ability to tailor machinery to local agroecological conditions. Some also remarked that local manufacturers have an advantage over importers related to quality as well as prices and after-sales services (i.e., repairs and spare parts availability). However, not everyone was so positive and the interviews also revealed challenges with product quality due to outdated machinery design, lacking standards and testing, substandard inputs and production equipment, and limited knowledge and skills.

### Key lessons learned

**Driven by small but dedicated entrepreneurs, markets for local machinery have emerged in all four case study countries.** Many entrepreneurs are guided by the vision of bringing innovative engineering solutions to help transform agriculture. Local manufacturers have several comparative advantages, particularly the ability to develop locally adapted machinery, an aspect that is of much higher importance related to agricultural manufacturing than other manufacturing sectors, and the ability to facilitate access to spare parts and repair services.

**But manufacturers also face a range of challenges related to production factors such as finance, human resources, industrial land, utilities, raw materials and production equipment.** Manufacturers are also held back by challenges related to the overall regulatory environment (i.e., import regulations, testing, and certification). These challenges can undermine the costs and quality of locally produced machinery.

**Better policies and more investments are needed to support local manufacturers, and generate a level playing field vis-à-vis global importers.** While public actors play a key role, efforts by and collaboration with private and third-sector organizations can help to create the necessary support needed for agricultural manufacturers. Ensuring a more supportive enabling environment can help local manufacturers to harness their comparative advantages vis-à-vis global manufacturers and to make “Made in Africa” the first choice of farmers and agro-processors.



## POLICY RECOMMENDATIONS

- **Invest more in knowledge and skills development** and make sure that existing institutions efforts emphasize practical aspects and feature the latest technological developments related to renewable energy and digitalization, among others
- **Support the knowledge and skills of existing manufacturers**, including related to business management. For engineering training, innovative formats where trainers meet at the workshop of manufacturers or where manufacturers bring their latest products to the training compounds may be useful.
- **Reinforce public research related to the design and local adaptation of machinery**, including on how to use renewable energy as a power source, and strengthen linkages between public research and development and local manufacturers
- **Reduce remaining trade barriers** affecting the availability, quality, and costs of raw materials and production equipment and manufactures ability to market products across countries
- **Strengthen facilities for machinery testing, certification, and standard setting**, potentially at the regional level to reduce the costs related to running of public testing centers
- **Improve general policies and investments relate to macroeconomic conditions** concerning credit markets, exchange rate policies, electricity networks, transportation infrastructure, education, and costs of doing business, among others

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## IMPRINT

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