

# MECHANIZED

## Transforming Africa's Agriculture Value Chains



With approximately 16 percent of agricultural land being cultivated with machines<sup>1</sup> and 11 percent of arable land being irrigated,<sup>2</sup> Ghana does comparatively well, but it remains on a lower level of mechanization. However, there are considerable regional variations in terms of machine adoption.<sup>3</sup> The 2018 African Union's Biennial Review Report showed that Ghana is on track to meet target #3.1, "Access to agriculture inputs and technologies," with a score of 5.9 out of above the minimum score of 5.53. The overall commitment category score is 10. The high annual agricultural output growth of 4.8 percent within the last 10 years demonstrates the Government's commitment to transforming its agriculture sector, although the country is not considered to be rapidly mechanizing according to our methodology, with an annual agricultural machinery growth of only 2.4 percent between 2005 and 2014.

### INSTITUTIONAL COMMITMENTS

In the 1960s, the Ministry of Food and Agriculture (MoFA) initiated a program of agricultural mechanization through the acquisition and operation of approximately 1,500 tractors in 32 district mechanization stations in the savannah zone.<sup>4</sup> The Transport Division situated within the ministry managed the Government's fleet of machinery and equipment and provided highly subsidized mechanical services to farmers, including plowing.<sup>5</sup> Since a mere 50 percent of the real costs could be recovered through the rental charges, in 1973 the government-led mechanization program was discontinued.

Between the mid-1970s and the mid-1980s the Government imported 5,579 tractors. Yet, during the same period, 5,016 tractors were left abandoned as tractors broke down frequently due to a lack of spare parts, qualified operators, technicians, and fuel.<sup>6</sup> Spare parts were especially difficult to obtain, due to financial constraints and issues of availability, particularly for the brands and models of tractors imported by the government.<sup>7</sup> Hence the governmental support

for mechanized services to farmers was discontinued and stopped in 1987.<sup>8</sup> After the MoFA decentralization program in 1997, the former Transport Division was renamed Agricultural Engineering Services Directorate (AESD).

The AESD is one of seven technical directorates within the MoFA, with four units dedicated to farm power machinery and transport, post-harvest management, soil and water conservation engineering, and rural technology information. Overall, the directorate's mandate is to ensure the availability of environmentally sustainable farm power and other engineering technologies. The AESD functions as an advising and technical backstopping institution for the MoFA; it initiates agricultural engineering policies, and coordinates the implementation of all engineering programs, policies and projects.<sup>9</sup> In 2007, MoFA and AESD jointly established the first Agricultural Mechanization Service Centres (AMSEC). By 2007, 17 AMSECs had been established, while another 72 opened between 2009 and 2011. The centers seek to support the private sector in the provision of affordable and timely access to farm power machinery such as tractors, planters, boom sprayers, pumps, and combine harvesters. Although the centers are designed as private entities to avoid direct Government management, AMSECs receive highly subsidized and selected machinery through the Government.<sup>10</sup> Most machinery is financed through concessional loan agreements with Brazil, Japan, and others.<sup>11</sup>

*The Food and Agriculture Sector Development Policy (FASDEP II, 2007-2015)*, developed by the MoFA in 2007, states the long-term policy objectives of the Government. Based on these objectives, the MoFA facilitated the preparation of Ghana's *National Agricultural Investment Plan (NAIP)* in 2010. Within the NAIP, agricultural mechanization along the value chain is emphasized as a key element with three specific targets:<sup>12</sup>

- Establish one private-sector led mechanization center in each district by 2015 (increase to 170 from the current 89);
- Facilitate private-sector engagement to establish mechanization service centers in areas where rainwater harvesting is the main irrigation technique for farming; and
- Provide incentives for agro-processing industries to adopt food grade processing technologies by 2012.

### POLICY AND PROGRAMMATIC COMMITMENTS

When governmental support for mechanized services to farmers stopped in 1987, the supply of machines and tools was left largely to the private sector. In 2003, the Government started to reemphasize the importance of mechanization, and by 2007 and through the AMSECs and AESD, referred



to above, assumed a renewed role in the provision of mechanization services. The AMSEC centers support the private sector with the goal that the private sectors provide farmers with access to farm power machinery such as tractors, combined harvesters, planters, boom sprayers, pumps, power tillers, seed drillers, slashers, ridgers, and rice mills.<sup>13</sup> On average private companies are given a machinery package of five tractors and matching implements, based on the expectation that each AMSEC could serve about 500 small-scale farmers with average landholdings of two hectares each in one season.<sup>14</sup> Although the package changed after some years, the aim of the program stayed the same. In March 2018, AMSECs had been set up in 89 districts, financed mainly through concessional loans received by the Government from various emerging economies such as Brazil, China, and India.<sup>15</sup> During the last decade, approximately 3,000 tractors were imported by the MoFA.<sup>16</sup>

According to Government estimates, the areas under mechanization increased from about 13 percent/hectare in 2008 to 19.3 percent/hectare in 2010 in total area under mechanization.<sup>17</sup> Based on external evaluations, the AMSEC program successfully increased the availability of mechanization services by eight percent. Further, farmers in AMSEC areas perceived a significant reduction in drudgery and a rise in yields.<sup>18</sup>

Besides government-driven cooperation with the private sector, there are a number of private sector run initiatives, ranging from small-scale entrepreneurs who import second-hand tractors to large-scale international tractor companies, like John Deere, that aim to develop business models for smallholders. The used tractor market plays a significant role, particularly for non-commercial farmers in Ghana. According to data from 2012, the used market imported about 3,000 tractors, which is similar to the number of tractors imported by the Government. The price for a used tractor is approximately US\$10,000, while the price of new (small) tractor ranges from US\$10,000 to US\$23,000.<sup>19</sup>

There are also new companies that offer to link smallholder farmers with machine operators, enabling farmers to make

use of hiring services along the food value chain, covering production, harvest, post-harvest and marketing operations. TROTRO Tractor has been operating in Ghana since 2016 and offers a wide range of hiring services devoted to land preparation, planting, spraying, threshing, shelling and transportation. TROTRO Tractor also supports machine operators, which are mainly other farmers, renting out their equipment to smallholders. Any of their services can be requested, scheduled and paid for in advance using a mobile app or SMS codes, providing a user-friendly self-service and delivery guarantees for the farmers, and payment guarantee for the machine operators that use their service.<sup>20</sup>

Initiated in 2008 and funded by the Bill & Melinda Gates Foundation, the *Cassava: Adding Value for Africa* project (C:AVA) sought to develop value chains for *high quality cassava flour* (HQCF) in Ghana. The project included different interventions focused on smallholders, processors and markets, improving root supply but also the processing of HQCF through the introduction of new processing technologies, management training, and mentoring. It promoted the use of special drying racks constructed of a wooden frame with sufficient strength and a porous drying surface made of mosquito nets to improve airflow. The project is still running in its second phase. By 2013, about 10,000 farmers had benefitted from the C:AVA project and the improved processing technologies.<sup>21</sup>

Although the Ghanaian mechanization sector is still in its early stages, with comparatively low machinery growth rates, the Government's commitment to mechanization is reflected by its support to the AMSECs and push toward growing private-sector involvement, particularly through increasing private-sector involvement in the hiring services market. To achieve further progress, more targeted policy interventions on agricultural mechanization will need to be developed and national research capacities further strengthened, for example through dedicated research institutions and courses on agricultural mechanization.<sup>22</sup>

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