

# MECHANIZED

## Transforming Africa's Agriculture Value Chains



From 2005 to 2014, the average annual agricultural output in Ethiopia grew by more than five percent. During the same period, the average annual machinery growth rate was almost three percent. The 2018 Biennial Review Report by the African Union showed that Ethiopia is currently on track to meet the Malabo Commitment area #3.1, "Access to agriculture inputs and technologies," with a score of 6.03, above the minimum score of 5.53, reflecting an ongoing vibrant mechanization process.<sup>1</sup> The overall commitment category score is 10.

### INSTITUTIONAL COMMITMENTS

From the late 1950s, the focus in Ethiopia was on the introduction of mule-pulled plows for tillage practices, publicly led through the two most transformative rural development programs and supported by the Ministry of Agriculture and the Jimma Agricultural Technical School. In 1959, first efforts were made to link education research with extension work for various aspects of agricultural engineering at Haramaya University.<sup>2</sup>

In 2000, the Agricultural Mechanization Research Unit was reorganized into the Agricultural Mechanization Research Directorate, situated within the Ethiopian Institute of Agricultural Research (EIAR). Besides the federally organized EIAR, Ethiopia has several Regional Agricultural Research Institutes, each with its own structure and mechanization research programs.<sup>3</sup> Since 2002, the Government has been promoting the agricultural sector with mechanization as a fundamental element to achieve agricultural growth and transformation. To enhance the capacity of key stakeholders, the Agricultural Transformation Agency (ATA) was initiated by development partners and set up by the government in 2010. The results-driven organization is chaired by the Transformation Council of the Prime Minister and the Ministry of Agriculture.<sup>4</sup>

Although Ethiopia's NAIP for 2010–2020 failed to explicitly address the need for agricultural mechanization<sup>5</sup>, the external midterm review by the Working Group on Rural Development and Food Security and Ethiopia's *Growth and Transformation Plan (GTP)* both acknowledge the need to implement mechanization in order to achieve the objectives set out in the NAIP.<sup>6</sup> In 2014, the Ministry of Agriculture and ATA jointly developed Ethiopia's Agricultural Mechanization Strategy to successfully institutionalize agricultural mechanization along the value chain.<sup>7</sup> The strategy specifically aims to raise the productivity of Ethiopian agriculture by:

- Increasing farm power derived from mechanical/electrical power by 50 percent;
- Reducing the use of animals for agricultural production by 50 percent;
- Promoting agricultural mechanizations technologies that can be used by female farmers; and
- Addressing 50 percent of the needs of pastoralists and agro-pastoralists for mechanization inputs.

### POLICY AND PROGRAMMATIC COMMITMENTS

Today, both the public and the private sector are engaged in the agricultural technology supply system, rental services, and tractor imports.<sup>8</sup> Private dealers like Ries Engineering, Motor and Engineering Company of Ethiopia (MOENCO), Gadeb Engineering, CLAAS tractors, and Hagbes have expanded and are now dominating the tractor sales market. Together with the public operation MetEC, the value of imported machinery increased rapidly from US\$10 million in 2005/06 to US\$70 million in 2013/14. US\$60 million in 2014 was spent on importing four wheel tractors and combine harvesters.<sup>9</sup> Further, some of the private companies, cooperatives and a number of larger commercial farmers not only import machinery, but also provide rental services to smallholder farmers. Lume Adama Grain Farmers Cooperative Union, a cooperative established in 1997, provides rental access to tractors, seed and grain cleaners, harvesting machinery, and transport trucks for its members and nonmembers.<sup>10</sup>

In fact, rental agreements remain a key element of mechanization in Ethiopia, as almost 70 percent of machinery-using farmers rely on them to plow their fields. In 2004, with initial capital of US\$750,000, the Agricultural Mechanization Service Enterprise (AMSE) was established to provide agricultural mechanization services on a rental basis. By 2012, AMSE had about 70 tractors, operating four service centers across the country. Another element is a



mobile workshop that reaches even the most remote areas in Ethiopia to service the tractors. Most of the tractors owned and operated by AMSE are medium-sized tractors with an engine capacity between 80 and 120 horsepower.<sup>11</sup> The centers not only provide heavy machines, but also provide maintenance services on a rental basis. Further, they provide farm implements and spare parts manufactured domestically or imported, offer transportation services of farm produce and farm inputs, and provide training and consultation services for a better and more effective utilization of farm machinery.<sup>12</sup>

In addition to a program focused on mechanization on the production side, the SAA/SG 2000 (Sasakawa Africa Association/Sasakawa Global 2000 Ethiopia) country program was established to strengthen capacity for extension service delivery along the value chain. The program seeks to help smallholder farmers acquire knowledge for crop productivity enhancement and postharvest and agro-processing. With the introduction of high-yielding rice varieties in Ethiopia in 2007 and the accompanied increase in rice yields, a number of post-harvest handling and processing services were introduced by SAA/SG 2000. Since 2010, the program has trained farmers in the use and operation of mechanical harvesters, threshers, cleaners, improved solar and mechanical dryers, rice mills, and on-farm storage. The introduction of post-harvest technologies has encouraged more farmers to grow rice, allowing them to process the crop quickly and maintain high quality.<sup>13</sup> The demonstration of hermetic storage facilities, particularly PICS bags in Ethiopia, resulted in early adoption because of the protection they offer from insects and the elimination of harmful chemicals in storage.<sup>14</sup>

Mechanization efforts are further supported by global development organizations and projects using new technologies like Digital Green. *Heavy Duty Equipment and Commercial Vehicles Academy* (HDECoVA) was launched in 2012 with the objective to set up a model academy. The academy provides vocational training for heavy machinery and trains 25 to 30 young girls and boys annually. During a four-year course, students access modern machinery and are directly involved in the production and maintenance of machines. In 2013, the center received 665 orders and had revenues of approximately US\$800,000 from industrial and agricultural sales. To date, more than 370 students have been trained in the academy.<sup>15</sup> Recent efforts to train farmers on a wide variety of technologies, including tractors, power tillers, rice seeders, and rice mills, are joint projects with the Japanese Association for International Collaboration of Agriculture and Forestry (JAICAF).<sup>16</sup> Recently, the *Korean-Africa Forum on Economic Cooperation* (KOAPEC) established a trust fund of US\$150 million to support Ethiopia in the field of transport and agricultural transformation, especially regarding agro-industrial parks.<sup>17</sup>

The approach taken by Ethiopia, with strong institutional commitments, programmatic interventions, and an emphasis on hiring services, has been shown to be effective in advancing the uptake of mechanization along the agriculture value chain. However, as the recent Biennial Review Report has shown, much progress remains to be made to meet national and international targets, including the Malabo commitment of ending hunger by 2025.

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