

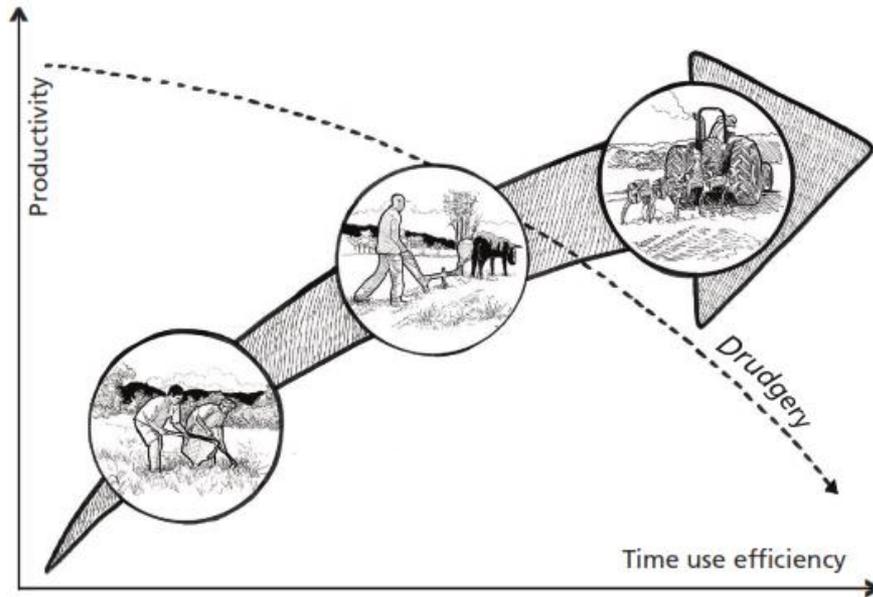
**Thought Leadership Series:  
African Agricultural Mechanisation**

**August 2018**

# Thought Leadership Series: African Agricultural Mechanisation

Agricultural mechanisation plays a significant role to promote farming and rural development in Africa

**Agricultural mechanization and its potential to reduce the drudgery of hand-powered efforts and increase labour and agricultural productivity**



Source: FAO, 2013d.

- Farm machines have revolutionised agriculture and continue to do so today.
- Some of the single biggest increases ever observed in Total Factor Productivity (TFP) in farming have been achieved thanks to the introduction of agricultural machines.

- Agricultural mechanisation (AM) is a central indispensable pillar for making farm operations efficient and productive in so far as it determines much of the efficiency and productivity of all the other inputs used in crop production such as seeds, fertiliser, water, labour, and time.
- In short, modern agriculture would be impossible without advanced machinery solutions.
- However, the use of machinery in farming still differs hugely across the globe.
- The United Nations Industrial Development Office (UNIDO) has defined 12 different levels of Agricultural mechanisation
  - The highest levels of mechanisation (levels 9–12) can typically be found in the USA and Western European countries.
  - By contrast, exceptionally low levels of mechanisation persist in many developing countries, particularly in Africa, which remains the most challenging region for mechanisation. Here, average mechanisation levels range from 5 (Morocco), 4 (Botswana) to merely 1 in Cameroon.

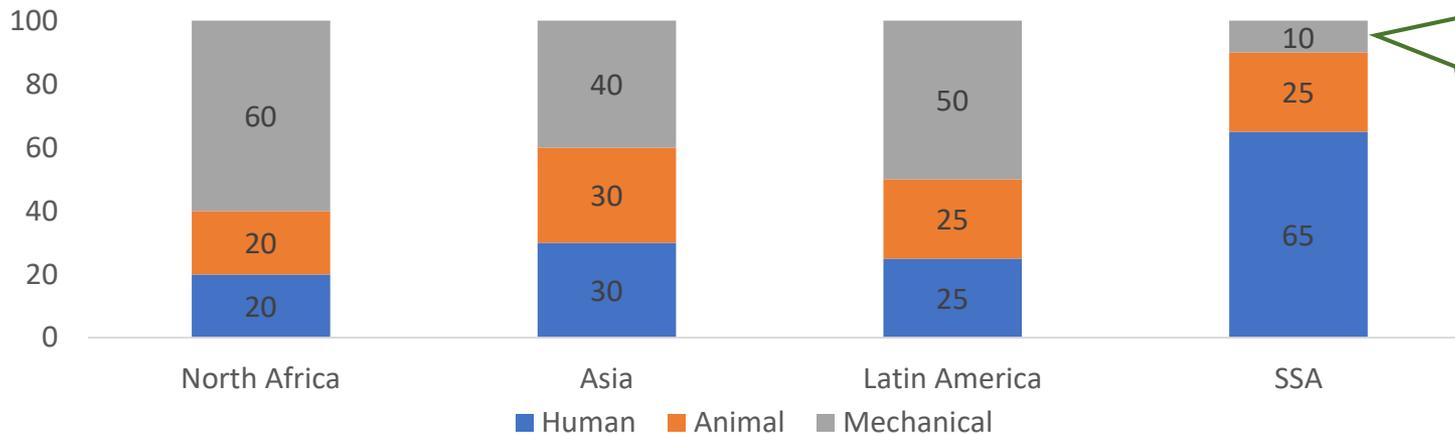
## **Key Take-Away:**

In Sub-Saharan Africa (SSA), land productivity is among the lowest in the world, and Agricultural mechanisation has either stagnated or retrogressed in recent years.

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Africa still relies mostly on human muscle to power farming operations in contrast to other developing regions

Farm Power Sources Across Regions (%)



SSA has the lowest mechanisation rate of all developing areas

- Farm power in African agriculture, especially SSA, relies to an overwhelming extent on human muscle power, based on operations that depend on the hoe and other hand tools.
- Such tools have implicit limitations in terms of energy and operational output in a tropical environment
- The relationship between hand, animal and engine power sources in Africa compared with other developing regions is illustrated above.
- In general, animal and tractor power have both declined in African agriculture in the past few years, making agriculture yet more reliant on manual methods in a continent where constraints such as severe health problems and demographic shifts make manual labour a scarce and weak resource.
- These methods place severe limitations on the amount of land that can be cultivated per family.
- They reduce the timeliness of farm operations and limit the efficacy of essential operations such as cultivation and weeding, thereby reducing crop yields.

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Africa has an opportunity to catch up to other regions' mechanisation rates even though it missed out on the Green Revolution

How Africa compares with other developing regions:

Indicator	Africa <sup>1</sup>	Ave of 9 Selected Countries <sup>2</sup>
Cereal yield (kg/ha)	1 040	3 348
Fertiliser use (kg/ha)	13	208
Irrigation as % of arable land	5	38
Tractors per 1 000 ha	28	241

<sup>1</sup> Africa less Egypt and Mauritius.

<sup>2</sup> Bangladesh, Brazil, China, India, Pakistan, Philippines, Republic of Korea, Thailand, Viet Nam.

- In the 1970s, Asia advanced in prosperity tied to increasing commercialisation of agriculture by supporting massive investments in irrigation, fertiliser and high-yielding varieties (the green revolution).
- This went hand in hand with increasing power inputs, mainly in the form of tractors for land preparation and diesel engines for irrigation.
- In mostly semi-arid Africa, where farming systems were more complex across variable agro-ecological zones, quality seed and fertiliser were not backed by irrigation support or mechanisation inputs.
- Therefore, Africa missed out on the green revolution.

Growth in tractor numbers between 1961 and 2000:

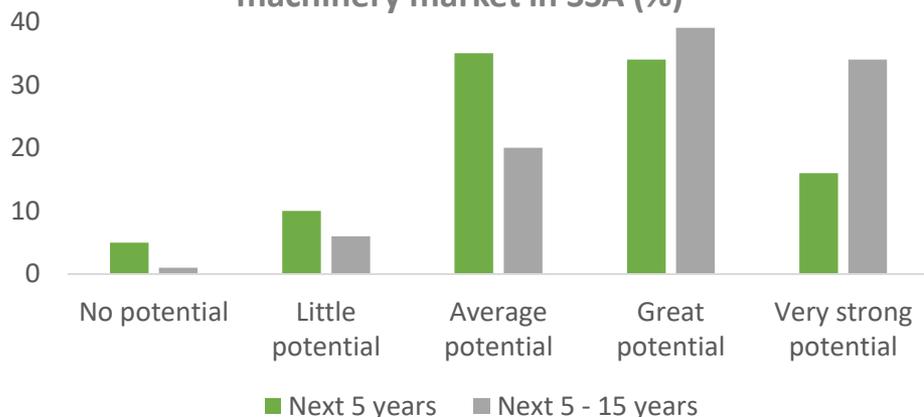
Region	Increase %
Asia	500
Latin America and Caribbean	469
North Africa & Near East	1 350
Sub-Saharan Africa	28

- The table on the left suggests that other developing countries have about ten times as many tractors per unit of farmland as those in SSA.
- Current statistics indicate that there are about 470,000 tractors in Africa, but little is known about their age or working condition.
- The total number of working tractors would have to be about 3.5 million (7 times more) to put Africa on a par with other regions.
- The Table on the right illustrates the greater advances in mechanisation in other regions compared with SSA.
- This suggests a major opportunity for Africa to catch up with other regions.

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Africa will require new models to unlock its agricultural potential through mechanisation including ownership and rental strategies

World Bank: Future potential of the agriculture machinery market in SSA (%)



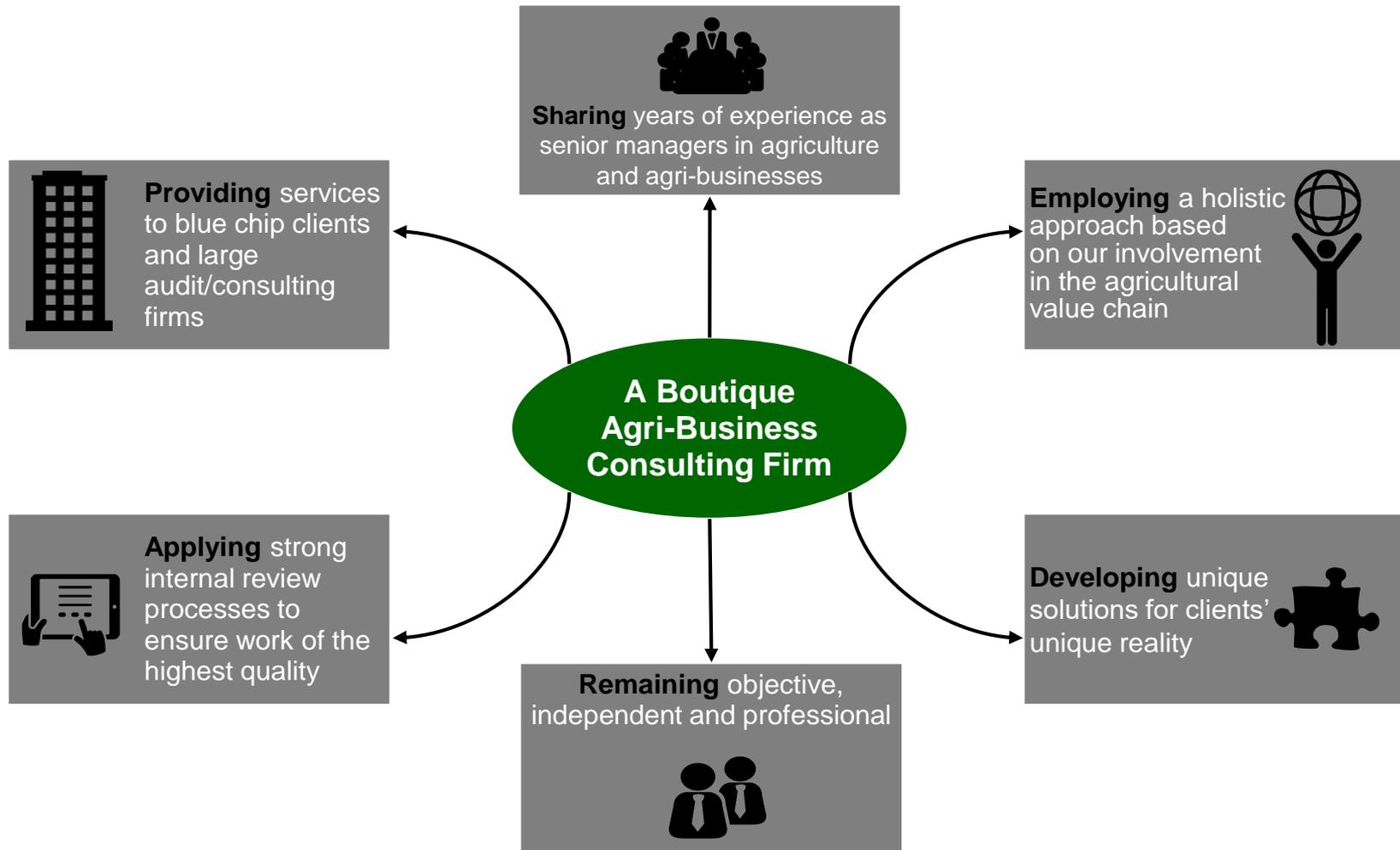
- A World Bank survey on the importance of the agricultural machinery market in SSA for suppliers worldwide provided the following results:
  - (i) The future market for agricultural machinery in SSA over the next five years shows very strong potential for 49% of respondents, and
  - (ii) Belief of a very strong potential market over the next 5-15 years rises to 74%.
- Improvement is however needed in all areas for industry to engage and invest more.
- The sectors include: government; finance and market; industry, and farmers and skills.

- Public-private partnerships (PPPs) will be very important for developing Specialised Agricultural Mechanisation (SAM) in SSA.
- The key areas for PPP practices are:
  - (i) Finance (access to credit, risk sharing)
  - (ii) Education/ skills (technology centres and demonstration farms)
  - (iii) Communication (exhibitions and knowledge sharing), and
  - (iv) Local manufacturing (clusters and assembly lines)
- Sheahan and Barrett (2014) report that the “ownership of agricultural machinery remains rare among African farmers, but much remains to be learned about rental and sharing arrangement that might enhance access for those who do not own equipment.”
- Thus, the traditional dealership business model alone cannot be efficient in the context of a nascent mechanisation market in SSA
- Rental and hire-service models would form part of the mechanisation strategy of small-holders, individual medium sized and larger commercial farmers, dealers, etc.

# Who is Afrilogic?



Afrilogic is a team of dedicated and highly skilled professionals that provide consulting, financial advisory and risk management services to selected clients



# Why Afrilogic?



Our team has first hand experience across Africa and understand the complexities of doing business on the continent

Into Africa Solution Services (PTY) LTD (trading as Afrilogic) was established to bring together the specialist service offerings of advisory professionals operating in the African Agri-business sector.

Our professionals have extensive experience in commercial and developmental agriculture and related projects on the continent. We also specialize in the financing of different projects in the agriculture value chain.

Our team has assisted various Agri-businesses in entering or expanding their operations into Africa. Sectors include *inter alia*: animal feed, agro-chemicals, fertilisers, poultry, livestock, commodity traders and finance.

Afrilogic also has a vast network of associates which can be utilised to fulfil project specific requirements due to the highly technical and specialised expertise required. These include:

- Agricultural Economists
- GIS Specialists
- Agronomists
- Horticulturalists
- Animal Nutritionists
- Marine Biologists
- Corporate Finance Professionals
- International Taxation and Financial Advisory Professionals
- Fixed and Moveable Asset Valuation Professionals
- Etc.

Our first hand experience in African Agriculture has helped us to develop not only innovative but also practical solutions for our clients. This ability to develop implementable solutions sets Afrilogic apart from other service providers who sometimes follow a very academic and theoretical approach.

## Recent Project experience

