POWERING SMALLHOLDER AGRICULTURE IN AFRICA

Two wheel Tractors for Farm Mechanization and Conservation Agriculture in Eastern Africa

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Why should I use a two wheel tractor (2WT)?
There are many uses for two wheel tractors...
That’s an impressive variety of uses! But do people really use such tractors?

Well, they have become popular in the last two decades. There are 14 million two wheel tractors in use around the world.

The majority are however not used for tillage, due to inadequate power, but for wetland rice cultivation.

CHINA
10 million

AFRICA
0.2 million

THAILAND
3 million

...But the increase is not uniform, and the variations are in some scenarios contradicting. While China has 10 million, Thailand has 3M and 0.2M for Africa.
Here are the numbers of four wheel tractors compared to two wheel tractors in use around the world.

### CHINA

<table>
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<th>23M total</th>
<th>43%</th>
<th>57%</th>
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### INDIA

|          | 2.8M total | 3.8% | 96.2% |

### BANGLADESH

|          | 96% | 4% |

...Of the highly mechanized, China has 43%, 2WT out of 23M tractors. India has 3.8% being 2WT of the total 2.8M 4WT; while Bangladesh has 96% being 2WT.
So why should I use two wheel tractors and not oxen or the large four wheel tractors?

The 2WT has low power consumption!

It also has a low level of investment!
It pulls and powers various farm implements, as well as creating much less pressure on the soil than large tractors, and being more efficient for smaller farm areas.
All this together greatly increases farm productivity!
Farm mechanization is needed now more than ever before because...
Farm power in SSA countries is on the decline!

Also, most of the government tractor hire schemes have collapsed...
There is a decline in the number of draught animals...
It replaces work carried out by manual labour or by working animals such as oxen, horses and mules.
And there is a decline in human labour as most of the productive age group is moving to urban areas.

Now who will plough the farms?
What a difficult situation!

Can Conservation Agriculture (CA) help alleviate farm labour shortages?

How does CA relate to small scale Farming?
Conservation Agriculture (or CA) involves farming techniques that:

- create no or minimum mechanical soil disturbance,

- use permanent soil cover with organic materials,

- and involve crop diversity through associations and rotations.
Conservation Agriculture is superior to conventional tillage in a few interesting ways:

In CA, ploughing is unnecessary and instead planting on residue or mulch covered fields is carried out. Small-scale mechanization increases power supply while CA compliments it by reducing power demand.
Small tractors may not be powerful enough to plough in most circumstances, but perfectly suited for direct seeding.
CA reduces some of the negative outcomes of mechanization, particularly those related to soil and water conservation.
Yield losses are 1.5% of potential yield for each day of delayed planting from the optimal. This is known science for years.

With 2WT mechanized CA, the optimal planting window is extended, for example by a couple of weeks. This leads to increased cropping intensity.
Using CA enhances biomass production, thus adds feed and fodder, and so one can easily increase the diversification of their livestock.
Furthermore, diesel fuel consumption is reduced by more than half. At the farm and national level, this is a huge saving in Green House Gas Emission - entrenching CC mitigation.
Precision planting leads to less seeds being used to cover a larger area of land.
You know, tillage is the most costly and time consuming field operation.

Yes.

So substantial cost savings are attained simply by switching from Tillage to Non-Tillage (less wear and tear).
How can farmers access small scale farm mechanization services?
Well, since government programs shut down, it’s become harder.

In as much as you can buy it for yourself, not everyone can.
Now we are bringing in private sector service providers, like Muriuki over there, to make services available to farmers.

You know, even a small scale farmer can use CA.

Indeed. Knowing that earlier large scale mechanization systems failed, we’re going more towards sustainable, scale-appropriate, and public-private sector driven mechanization.
There’s an opportunity in renting out the equipment you acquire, such entrepreneurship is encouraged.

The community’s need for mechanization is what inspired me to start my own business!
Thank you very much for all this information, Muriuki and Bahati! I'll be sure to spread the good word to my friends and neighbours!

It was our pleasure! We're always happy and here to help you!

In the meantime, you're always welcome at my shop!
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