Small scale mechanization

- Agricultural mechanization involves the use of hand and animal operated tools and equipment as well as motorized equipment to reduce human effort

- Agric mechanization improves the

1) Timeliness of operations and

2) Quality of the various operations

The above two increases

- yields

- quality of product

- overall efficiency of crop production.

- Small scale mechanisation therefore involves the use of the above mentioned tools and equipment but with low capacities
- Tools and equipment that can be used by small scale farmers are relatively cheaper and easy to operate and maintain

- Small scale mechanized equipment (like 2WT) will therefore fill in the gap between the commonly used animal draft powered equipment and standard commercial equipment like 4 WT

ADVANTAGES OF 2 WHEEL TRACTORS BASED ON CA

- Low procurement cost
- Low operational costs ($15-20/ha labour, fuel, maintenance overheads)
- Tractor can be used for various uses planting, transport, shelling etc
- Planters used with the 2WT can plant various crops (maize sugar beans, sunflower, finger millet, sorghum, cow pea)
- Planters can be set to plant various plant populations, and fertilzers.

- Good germination rates
- Equipment portable, can be transported with a 1 tonne pick up truck.
- The 2WT with a single row planter can be used to drill basal fertilizer after germination
- The 2WT can also be to drill urea fertilzer (Urea is a cheaper option comppared to AN
- The combination of 2WT and planter produces straight line which facilitate post germination use of other equipment

Conservation Agriculture Mechanization

- CA mechanization refers to selection, utilization and management of agricultural machinery and equipment under CA practices governed by CA principles.
- Any equipment or machinery to be used under CA must ensure minimum soil disturbance, leave crop residue covering the soil, plant all crops used in CA rotation.

CA Machinery selection

- Principles of CA machinery selection involves the process of making a decision on what type of machinery or implement to use under CA.
- The selection of CA machinery is based on **technical** and **financial** issues.

TECHNICAL ISSUES

1. Implement/machine capacities

- Small areas of less than one ha, the recommended mechanization system are manual based systems namely basins and jab planters.

- These implements have very low capacities.

- The direct seeders and rippers are recommended for areas of up to three ha and for larger areas tractor drawn direct seeders are recommended.

- These are of high capacities.

Technical issues cont...

2. Source of draught power

In situations where farmers have no access to draught power, basins and jab planters are recommended.

Where animal draught power is available, the ripper tines and direct seeders are recommended.

Technical issues cont...

3. Labour Requirements

Manual based systems are labour intensive as compared to mechanized systems.

FINANCIAL ISSUES

- Capital is required to invest in CA machinery.
- Under these circumstances, hiring and group ownership is recommended.
- Repair and maintenance costs are reduced in this arrangement.

- Operational costs are high with direct seeders as opposed to shaka hoes and rippers.
- Farmers with limited resources are therefore recommended to use shaka hoes and rippers which are less sophisticated.

CHALLENGES WITH MACHINERY

End users require skills to set, operate, calibrate and maintain the equipment for it to serve the intended purpose.

BENEFITS

The introduction machinery in CA has the following advantages

- it reduces drudgery
- counter act labour shortages
- a catalyst in CA upsacaling

Thank You.