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MECHANISATION FOR SMALLHOLDER AND SUBSISTENCE FARMERS IN SOUTH AFRICA AND ENABLING POLICY AGENDA

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Presentation outline

1. Status of agriculture & mechanization in South Africa - In brief
2. General state of mechanization in South Africa
3. Mechanisation levels and state at smallholder farmer's level
4. Drones technology for use in advancing smallholder mechanisation systems
5. Conservation Agriculture mechanisation support in the country
6. Comprehensive Agriculture support programme
7. Mechanisation challenges faced by smallholder and subsistence farmers
8. Way forward to improve smallholder and subsistence farmers mechanisation

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Status of agriculture - In brief

The agricultural sector in South Africa is dualistic consisting of large and small scale agriculture, however smallholder constitute 98% of the total number with **2 668 503** farmers **using 2 005 818.86 ha**

Total area under agricultural cultivation is **14 208 116 ha**

A: Subsistence farming

- This constitute almost 2 million farmers, 54% involve in crop production, 31% doing mixed farming and 15% in livestock farming
- They occupy limited land scape due to past injustices

B: Small Scale Farming (SHF)

- Farms size is small in nature and is labor-intensive, uses traditional production techniques, lacks institutional capacity and support.
- Lack of equipment and poor maintenance of the existing ones.
- Less than 12% farmers own tractors and farm implements.

C: Large scale – High level of mechanization (LSCF)

- Is well-integrated, highly capitalized commercial sector
- About 40 000 farmers in SA are large scale
- On average own 299 ha and utilise about 12 million ha of cultivated land.
- Total income of Commercial agriculture industry in 2017 was R332,8 billion

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General state of mechanization in South Africa

- LSCFs own at least 90% of the tractors in the country.
- Large scale farmers highly mechanized owning tractors, machinery and equipment from land preparation, crop establishment and protection, harvesting and processing.
- LSCFs have established postharvest machinery, equipment and infrastructure.
- It is estimated that in 2010 there were 67,500 tractors in the country. Subsequently 6800 are sold every year from 2015 while a similar proportion is retired and normal sold as second hand to neighboring countries.
- Entrepreneurs run tractor for hire services, this is the dominant source to obtain tractor power for SHFs.
- South African agriculture has introduced conservation and precision agriculture equipment and drone technology is making significant strides.
- Tractors provided by government programmes are another way of empowering SHFs like the Presidential 72 tractor packages and 200 no till planters and boom sprayers provided to all provinces

Mechanisation levels and state at smallholder farmer's level

- The majority of SHFs (88%) don't own any tractor at all.
- However, tractors have been widely adopted for SHFs either through acquisition or hire in various provinces.
- Less than 30% of the tractors and implements owned by SHFs are in good operational conditions.
- SHFs lack postharvest infrastructure and processing equipment and suffer huge postharvest losses of 20-80% depending on commodity
- Fruits & vegetable SHFs are significantly mechanized at the primary level

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Smallholder farmers' current mechanization – low level

- Overall, there is lack of equipment among smallholder farmers and poor maintenance of the existing ones.
- Hay and fodder production equipment still remains a challenge for SHFs

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Crop establishment

- No-till planting

The South African government and the Agricultural Research Council have acquired and distributed crop establishment equipment to SHFs

- Two wheeled tractors

- Direct seeding developed @ AE

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Mechanisation for Crop protection

Sprayers

Boom sprayer and Knapsack sprayer widely adopted by small holder farmers for crop protection

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Mechanization for crop protection

New technologies

Research efforts in South Africa are introducing the following technologies for crop protection for SHFs:

- Insect catchers, smart sprayers
- Currently the Institute of Agricultural Engineering is working on development of a smart sprayer

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Mechanization for crop protection

The agricultural research council is adapting and introducing
a cassava harvester to SHFs in Mpumalanga and Limpopo provinces

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Small holder and subsistence farmer, adoption of mechanization technology

Introduction of Drones

- Drones, are being used for land use planning, veld survey, overgrazing and stock counting, Project monitoring, spraying, crop growth monitoring etc.
- The ARC-NRE has a research Project to foster adoption of drones by SHFs.
- LandCare programme acquired **two drones** for national use and assist provinces in formalization and use of drones-tech.
- **Drones sharing schemes** or Extension use by government officials can foster adoption.

(Source: Insurancejournal)

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Mechanization support provided to smallholder farmers

Training:

- Training the calibration of machinery and equipment, correct use and maintenance is key in the empowerment of SHFs
- Agricultural Research and government are key in the provision of technical and advisory services to SHFs in South Africa.

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Smallholder farmers' current mechanization-Conservation Agriculture (CA)

In addition to conventional tillage, conservation agriculture is also promoted in SA:

The policy of CA seeks to **transform South African land use systems towards a sustainable food production system**, **adopted by the majority of farmers**, which will increase the food security status of South Africa and its citizens, whilst reducing vulnerability to food scarcity and the related risk to national security.

- CA policy advocate for support to upscale local manufacturing of CA machinery through various incentive measures e.g. tax rebates and reduction on CA mechanization import duties
- CA upscaling by smallholders is part of Minister deliverable to advance sustainable development targets, land degradation neutrality targets, adapt and mitigate climate change.
- Many CA farmers lack no till planters and appropriate harvesting machinery for alternative crops such as soybeans, dry beans etc.

Smallholder farmers' current mechanization– Comprehensive support programme Policy

- Draft comprehensive support programme policy seeks to guide, coordinate and harmonise implementation of mechanisation support services by the State that will ensure the sustainable utilization of the natural agricultural resources for increased food production particularly by resource poor farmers by;

i. Promote agriculture mechanisation through the application of appropriate machinery and technology for various categories of producers;
ii. Promote gender responsive, agro-ecological and environmentally friendly mechanisation technologies within the principles of sustainable agriculture to mitigate against the negative impacts of climate change;
iii. Facilitate capacity development opportunities for improved research and technology development and transfer on mechanisation;
iv. Promote a conducive environment for local manufacturing and distribution of agricultural machinery and technologies within the ambient of the Black Industrialist Programme;
v. Stimulate entrepreneurship and youth participation through mechanisation in the sector; and
vi. Mechanisation services to be provided in line with the recommended own contribution for various categories of producers.

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Challenges faced by smallholder and subsistence farmers

- Access to small scale financial aid to build mechanization system
- Access to locally developed tractor, machinery, equipment and implements inclusive for harvesting, based on affordability and moderate level of technology
- How to deal agricultural mechanization more like a business and enterprise so that it can be profitable from investment
- Skills and knowledge to own, operate and maintain the mechanization tools are limited
- Institutions and partners lack the information about sustainable agricultural mechanization framework for Africa (SAMA) intentions

The way forward - Action plan to deal with challenges

- Sustainable and continuous support and of SHF in their mechanization requirements
- Match mechanisation scale and farming size. It doesn't mean the bigger the better.
- Training SHFs in the operation, maintenance, calibration and servicing of tractors and implement and capacity development at college and district level
- Support and develop local manufacturers of machinery and equipment to develop moderate level of technology targeting SHF to alleviate laborious constraints, reduce water and soil contamination and improve productivity
- Mandatory government testing mechanization Centre and localization to advance SAMA element of innovative systems for sustainable technology development and transfer
- A government led coordinated approach about SAMA elements and action plan
- Aligned government mechanization support policy across programmes and SAMA

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Thank you!

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