ANALYSIS OF COTTON BY PRODUCTS SURVEY IN ZIMBABWE

Dr. Gibson Chigumira

27 September 2017

Bronte Hotel

PRESENTATION OUTLINE

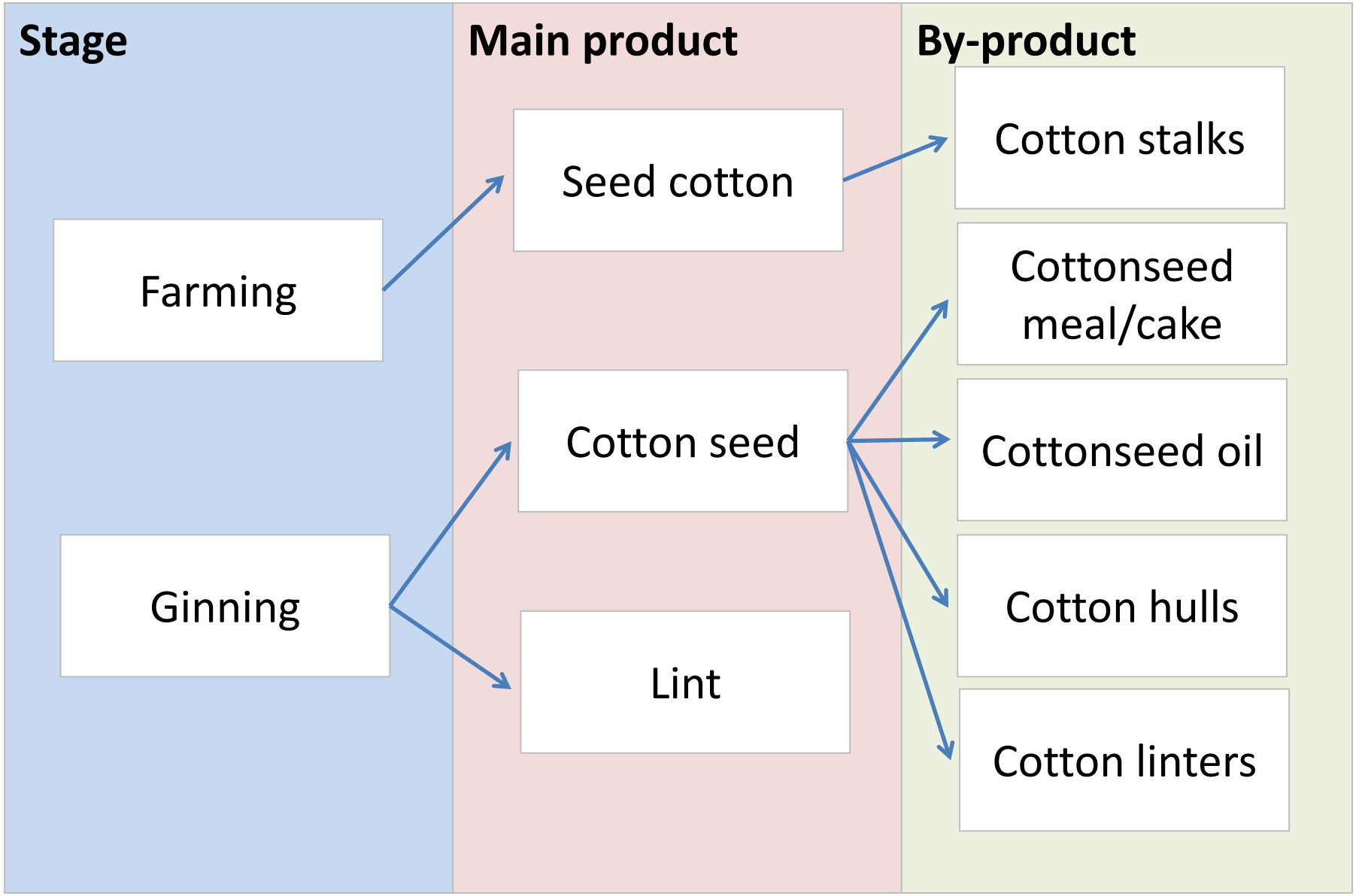
- Objectives of the Survey;
- Methodology;
- Potential Commercial uses of Cotton by-Products & Gaps in Zimbabwe;
- Impediments to Cotton by-Products Value Addition;
- Infrastructure & Technology
- Stakeholder Perceptions
- Concluding Recommendations

Objectives of the Survey

- To identify impediments to development of cotton by-products;
- To understand infrastructure & technologies available at each activity step of the VC;
- To understand producers' demographic and income profiles, margins and cost drivers from cotton and cotton by-product activities;
- To understand the perceptions, mind-sets and views of each VC actor about development of cotton by-products;
- To understand the main motivation of the value chain actors' decision to invest or not in cotton by-products; and
- To identify incentives for motivating farmers, ginners, spinners and other actors to develop cotton by-products.

Methodology

- Documents review;
- Key informant interviews with ginners, oil expressers, feed manufacturers, farmers' unions, AMA and Ministry of Industry & Commerce;
- Interviews with 233 farmers in Gokwe, Muzarabani, Chiredzi and Bindura;
- Country case study of Uganda.


Stage
Main product
By-product
Farming
Ginning
Seed cotton
Cotton seed
Lint
Cotton stalks
Cottonseed meal/cake
Cottonseed oil
Cotton hulls
Cotton linters

Potential Commercial uses of Cotton by-Products & Gaps in Zimbabwe

Potential commercial uses of cotton stalks:

- A source of fuel (briquettes)
- Production of corrugated boxes for packaging
- Fibreboard manufacture for partition boards and furniture
- Production of kraft paper

- Cotton stalks availability: **average of 383,500 tonnes/year;**
- **In Zimbabwe the stalks have no commercial value.**

Cotton stalk

Cotton stalk briquettes

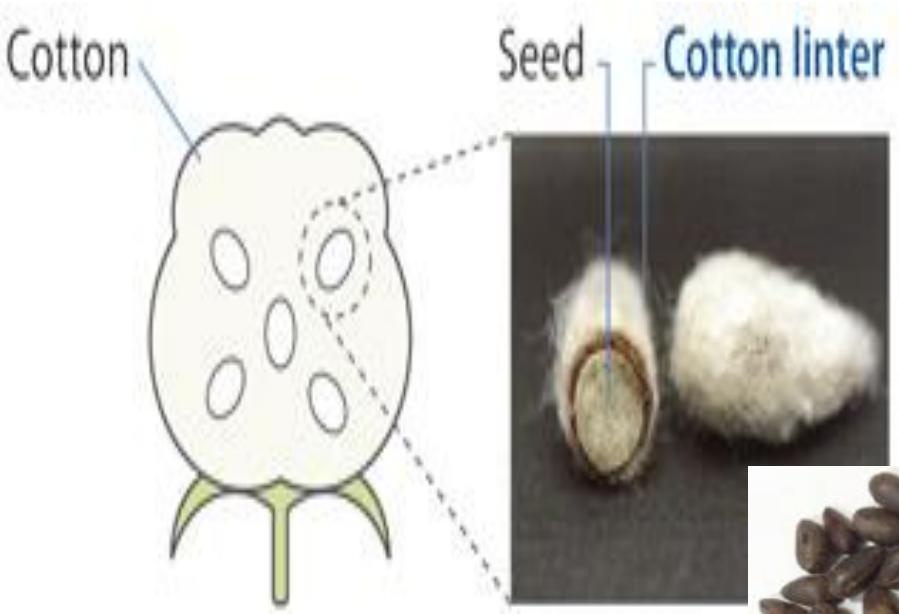
Cotton stalk pellets

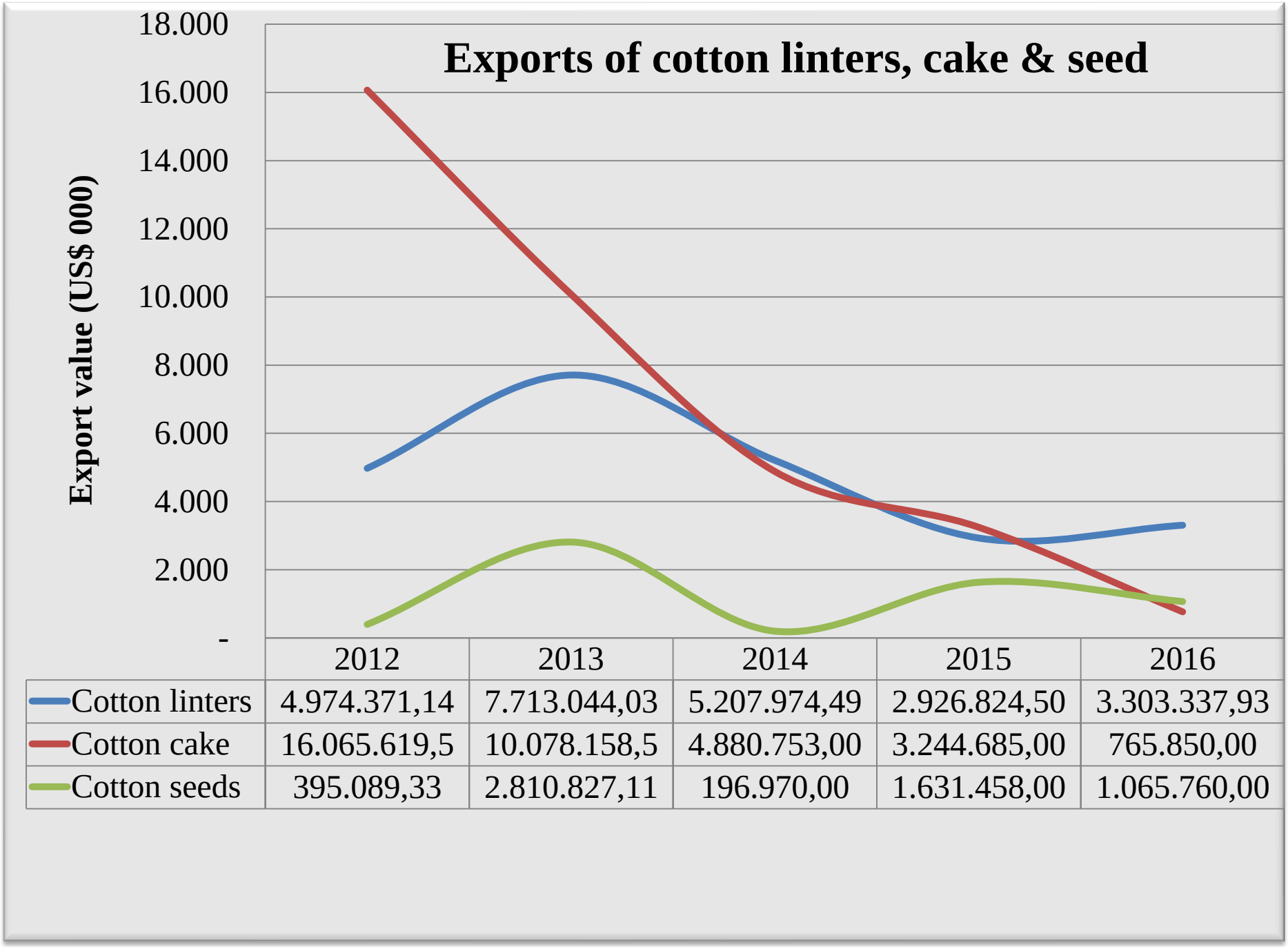
Cotton stalk particle boards

Potential commercial uses of cottonseed:

- Seed multiplication (planting cotton seed)
- Feed manufacturing (1% of raw material for feed)
- Oil expression (oil is 18% of seed value)
- Cottonseed meal (44% of seed value)
- Linters
- Hulls
- Gums for lecithin production for margarine
- Exports

- In Zimbabwe cottonseed has commercial value in seed multiplication, feed manufacturing, oil expression and exports;
- A tonne of cottonseed produces 200kg of oil, 500kg of cottonseed meal and 300kg of hulls.


Cotton
Seed
Cotton linter



	2012	2013	2014	2015	2016
Cotton linters	4.974.371,14	7.713.044,03	5.207.974,49	2.926.824,50	3.303.337,93
Cotton cake	16.065.619,5	10.078.158,5	4.880.753,00	3.244.685,00	765.850,00
Cotton seeds	395.089,33	2.810.827,11	196.970,00	1.631.458,00	1.065.760,00

Potential Commercial Uses of Linters

- Manufacture of cellulose products (e.g. cellulose acetate, carboxymethly cellulose, viscose rayon, microcrystalline cellulose, cellulose nitrate);
- Preparation of specialty-grade paper;
- Exports;
- Produce receipt books and security paper, including currency paper for the Government;
- Linters constitute 7% of cottonseed value;

- **In Zimbabwe linters are exported only without being value added; they once were value added into receipt book, security & currency paper**.

Cotton Linters

Pulp

Felt (upholstery, cushions, mattresses)

Yearns (candle wicks, twine etc)

Medical cotton (tampons, swabs etc)

Fibre pulp

Paper

Cellulose and ethers (toothpaste, hair care products etc)

Viscose

Cellulose Acetate

Food casings

Rayon spun yarn

Plastics (Automotive parts)

Films (photography, envelope windows etc)

Yarns (clothing)


certificate


500
500
500 EURO

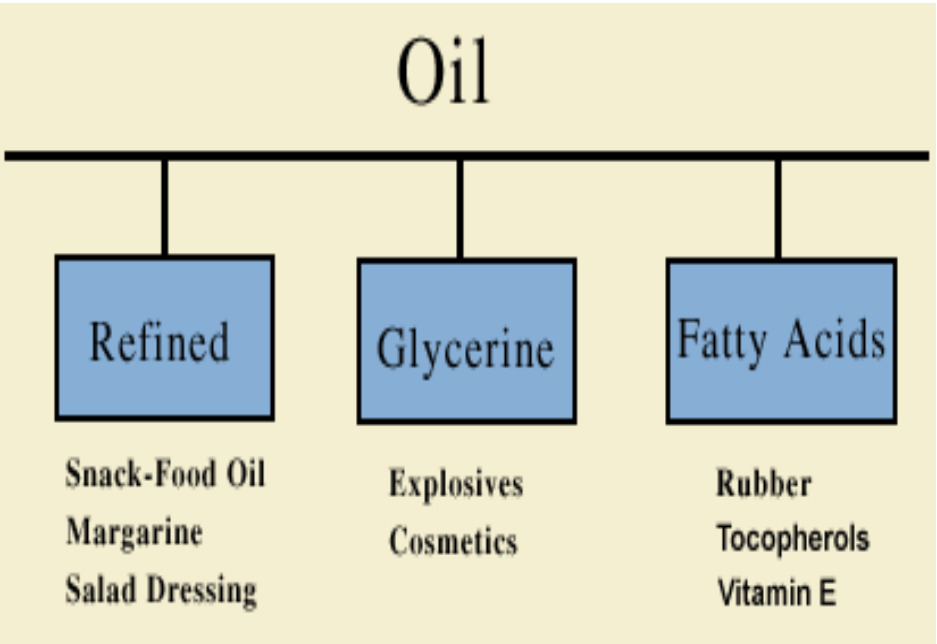

Natural
KRAFT
32 JPG 300 DPI
BY MG DESIGNS

Potential Commercial Uses of Motes

- Produce non-woven products such as those produced using linters;
- Used in cushions for sofas and chairs;
- **In Zimbabwe motes are being used by furniture manufactures to make cushions for sofas and chairs;**

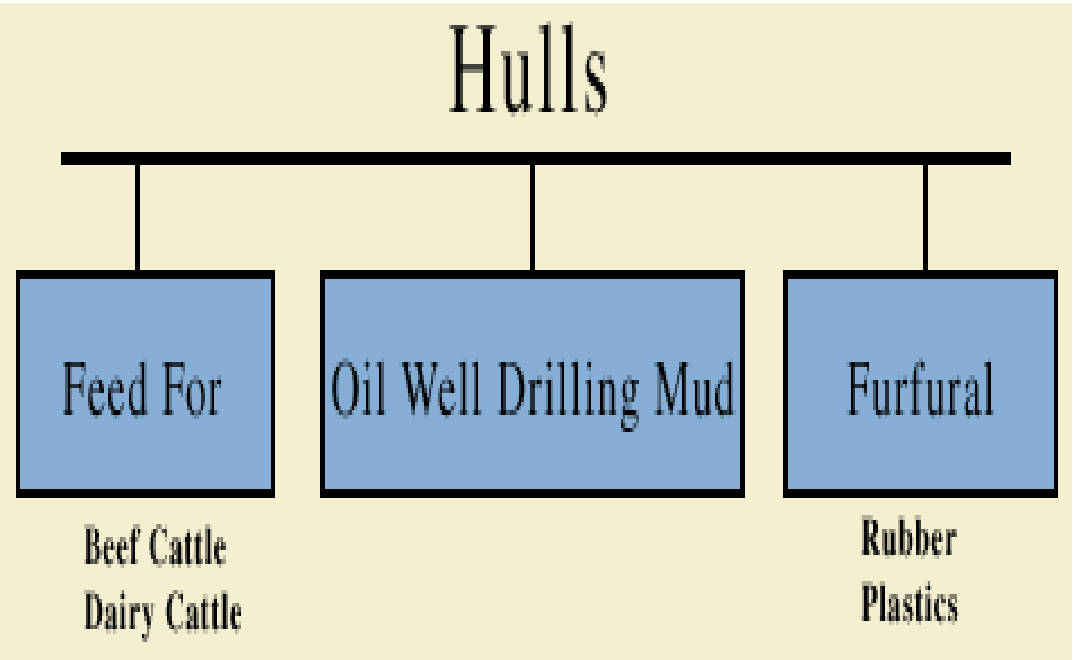
Potential Commercial Uses of Cotton Seed Oil

- Cooking oil
- Margarine
- Soaps & detergents
- Candles
- **In Zimbabwe cottonseed oil is only being used for cooking oil.**



Potential commercial uses of hulls

- Feed manufacturing;
- Mixed with cottonseed meal to create a higher density product that is easier to transport and handle
- Blended with the meal to provide roughage
- **In Zimbabwe hulls are used in feed manufacturing and sold as scrap to customers who use it as fuel.**

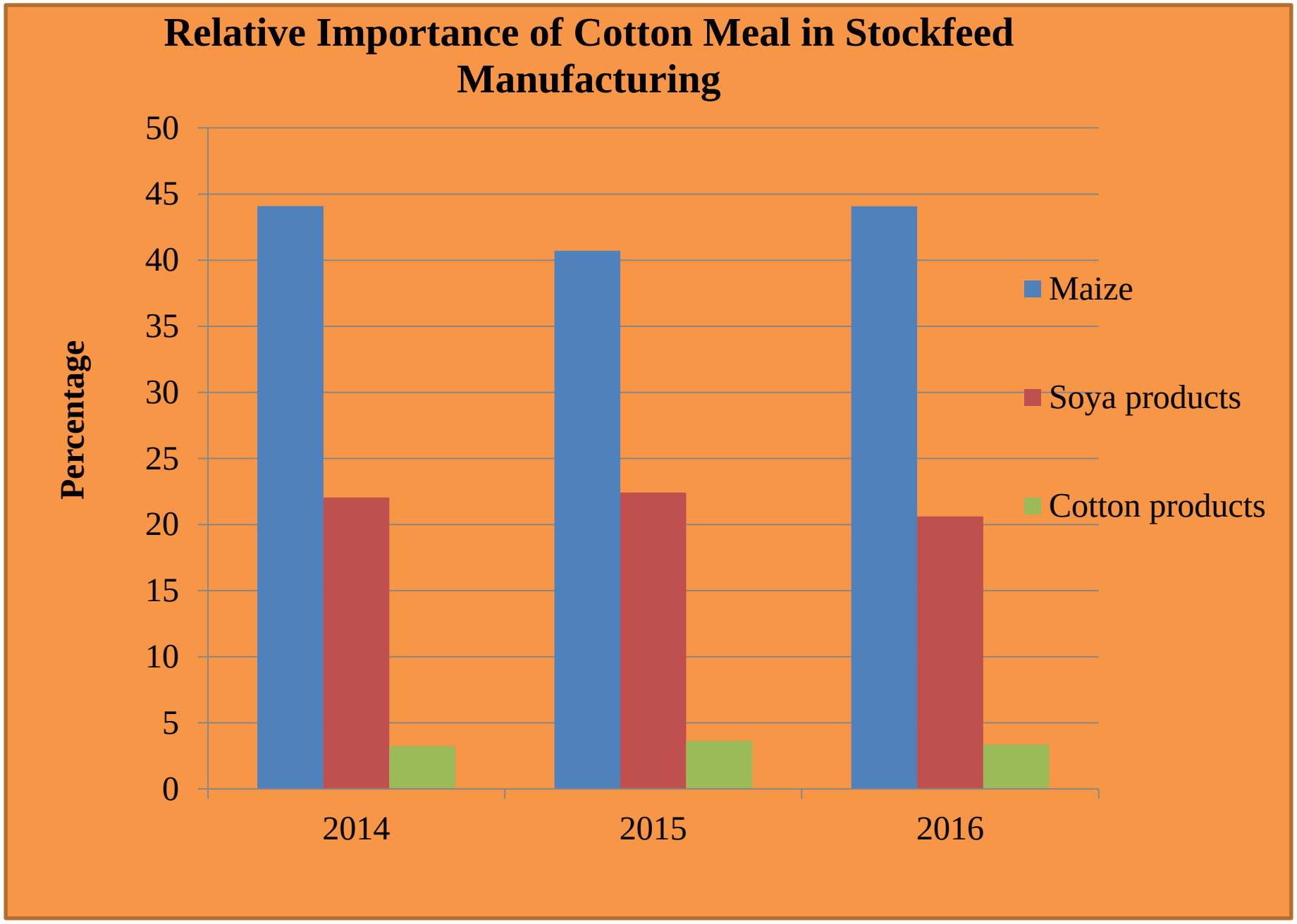


Potential Commercial uses of Cotton Seed Meal

- Feed manufacturing (1% to 2% of raw materials and 12% to 13% of the total costs)
- Used as a natural fertiliser for acid loving plants (e.g. camellias, blueberries)
- Exports
- **In Zimbabwe cottonseed meal is mainly used in feed manufacturing and for export**.

Cottonseed Meal Fertilizer

Natural source of nitrogen, phosphate, and potash that helps create an acidic soil condition and aids in production of friendly soil bacteria


Relative Importance of Cotton Meal in Stockfeed Manufacturing
Percentage
50
45
40
35
30
25
20
15
10
5
0
2014
2015
2016
Maize
Soya products
Cotton products

Impediments to Cotton by-Products Value Addition

Cotton Stalk

- Lack of knowledge among farmers and VC actors;
- Lack of necessary value addition technologies;
- Competition from cheaper imports e.g. kraft paper, renders investment in local production risky;

Motes and Linters

- Insufficient quantities to achieve economies of scale;
- Low cotton production;
- Side marketing, reducing ginners' willingness to invest;
- Poor yields;
- Declining number of cotton farmers;

Cottonseed Meal & Hulls

- Availability of pastures for ruminant animals;
- Lack of cost-effective technologies to extract gossypol;

Margarine

- Not cost effective,
- Insufficient volumes of oil for household and industrial use.

Soaps & detergents

- Dark colouring and foul-smelling requires extra additives which reduce viability,
- There are prohibitive costs to clean and purify the soap,
- Availability of cost effective substitutes,
- Limited availability of seed cotton oil.

Candles

- Low wax content,
- Limited quantities of oil,
- Costly technology,
- Uneconomical as it requires additional chemicals,
- Availability of cheaper alternatives.

Infrastructure & Technology

Generally available but needs further investments

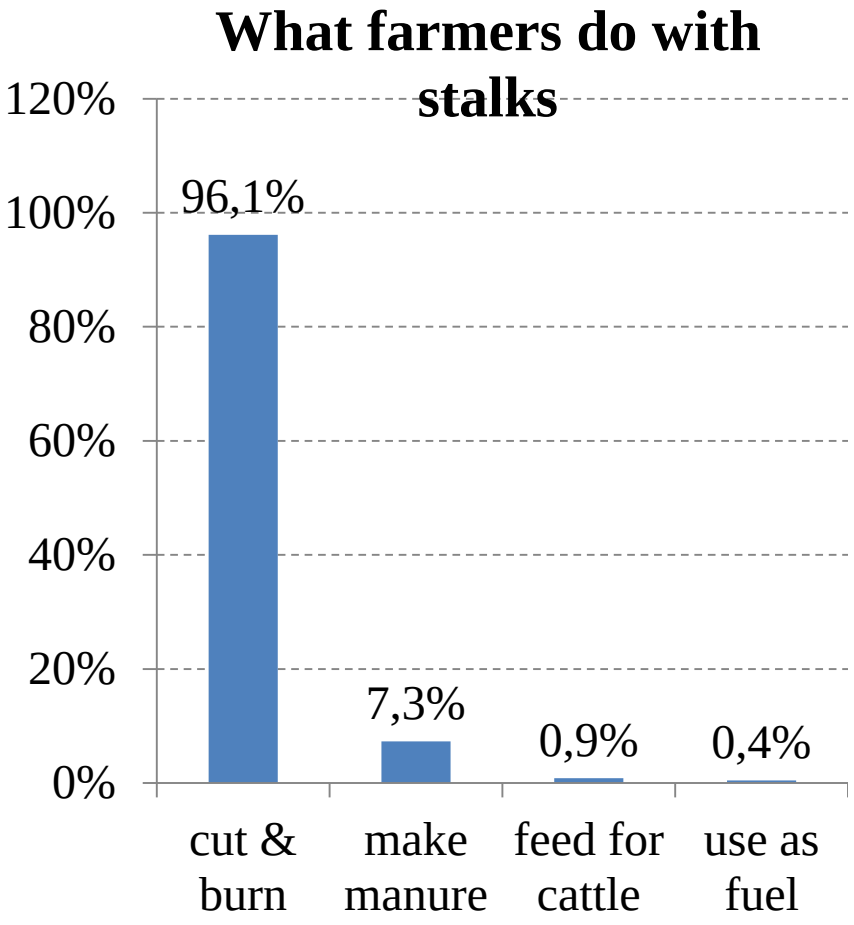
- Cotton Research Institute and Quton have infrastructure for Seed breeding, agronomy, entomology and pathology
- Cottco, Alliance and Olam have seed multiplication infrastructure
- ginners generally have state-of-the-art ginneries with underutilized total capacity of 440,600 tonnes per year
- State-of-the-art equipment for cooking oil manufacturing (e.g. Surface Wilmar has cutting edge equipment)
- State-of- the-art equipment for feed manufacturing (e.g. Agrifoods cutting-edge equipment, with underutilized capacity of 4,000 tonnes per day)

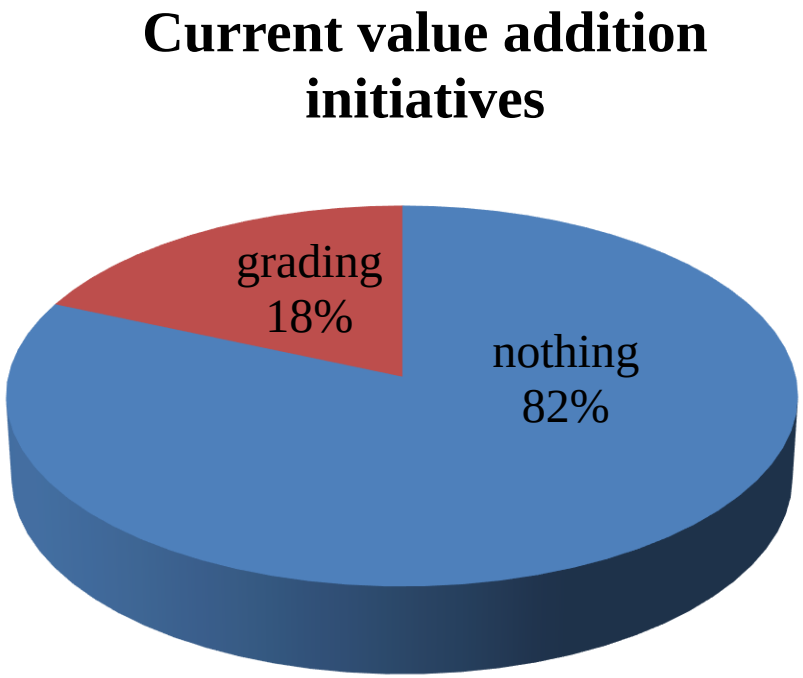
Gaps in Infrastructure & Technologies

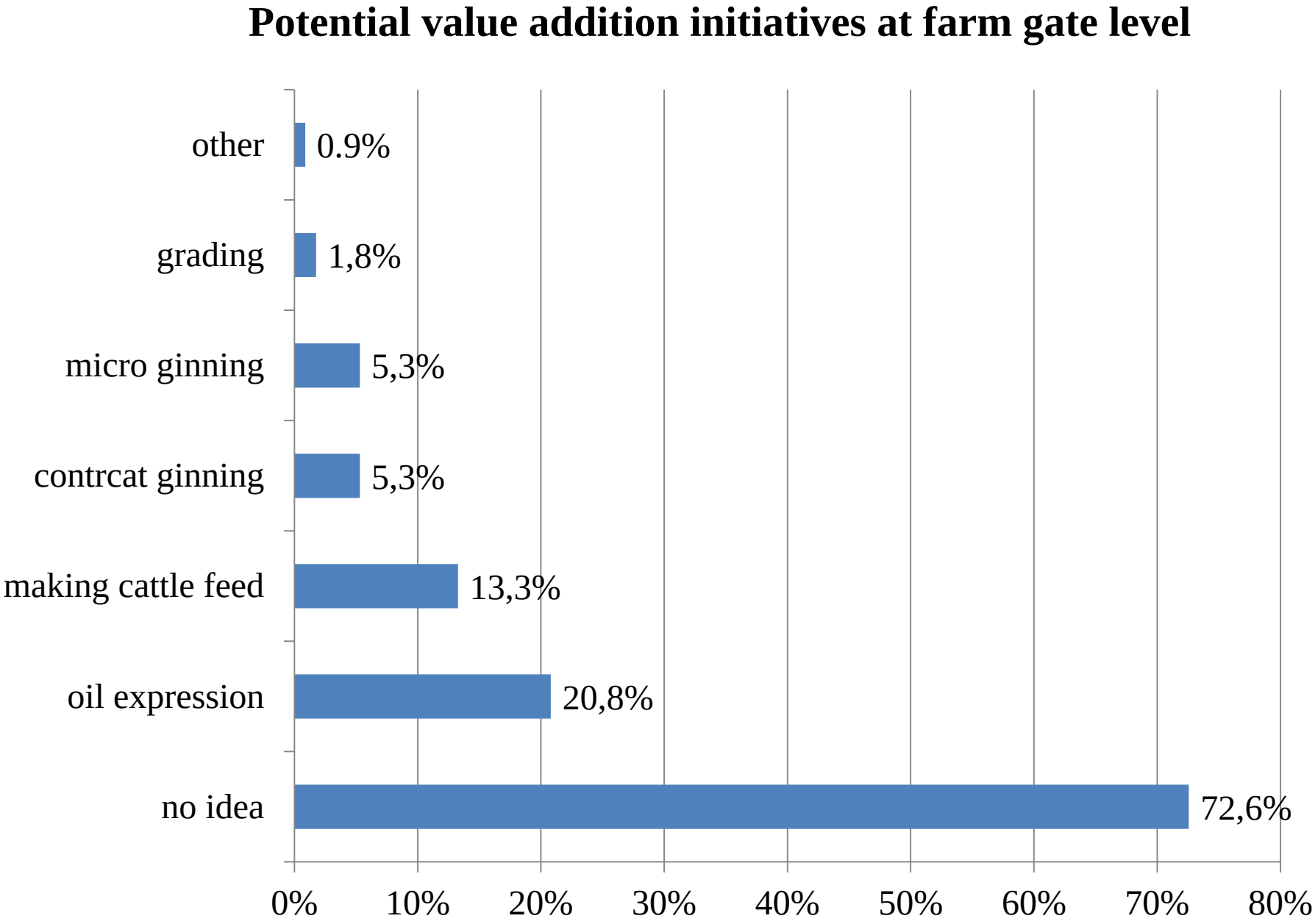
- Poor agronomic practices (e.g. late plantings, low plant populations, poor weeding, incorrect application of chemicals, improper harvesting, non-use of fertilizers);
- Low level of mechanisation in cotton production;
- De-waxing of cottonseed oil to produce candle wax

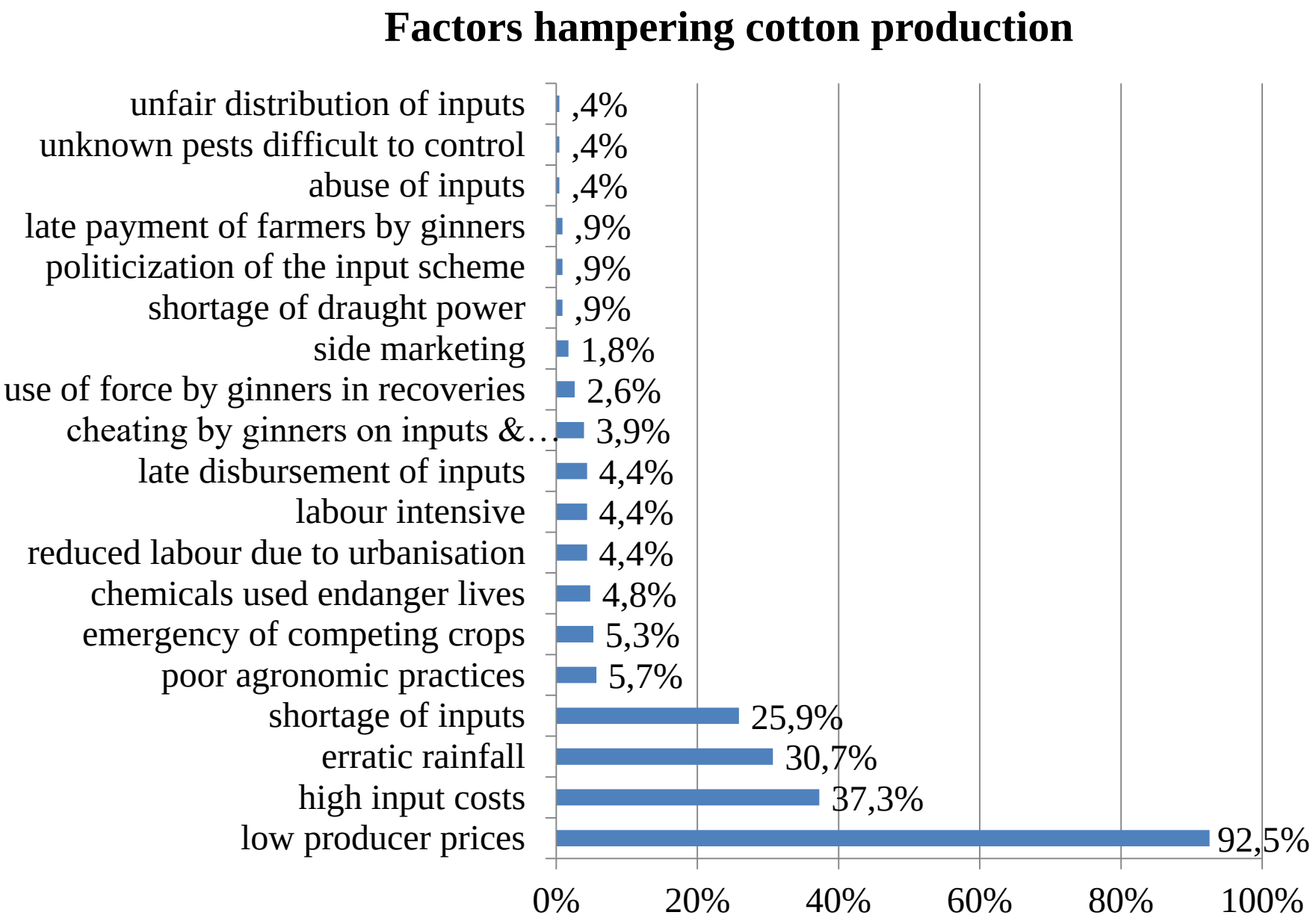
STAKEHOLDER PERCEPTIONS

Farmers' perceptions

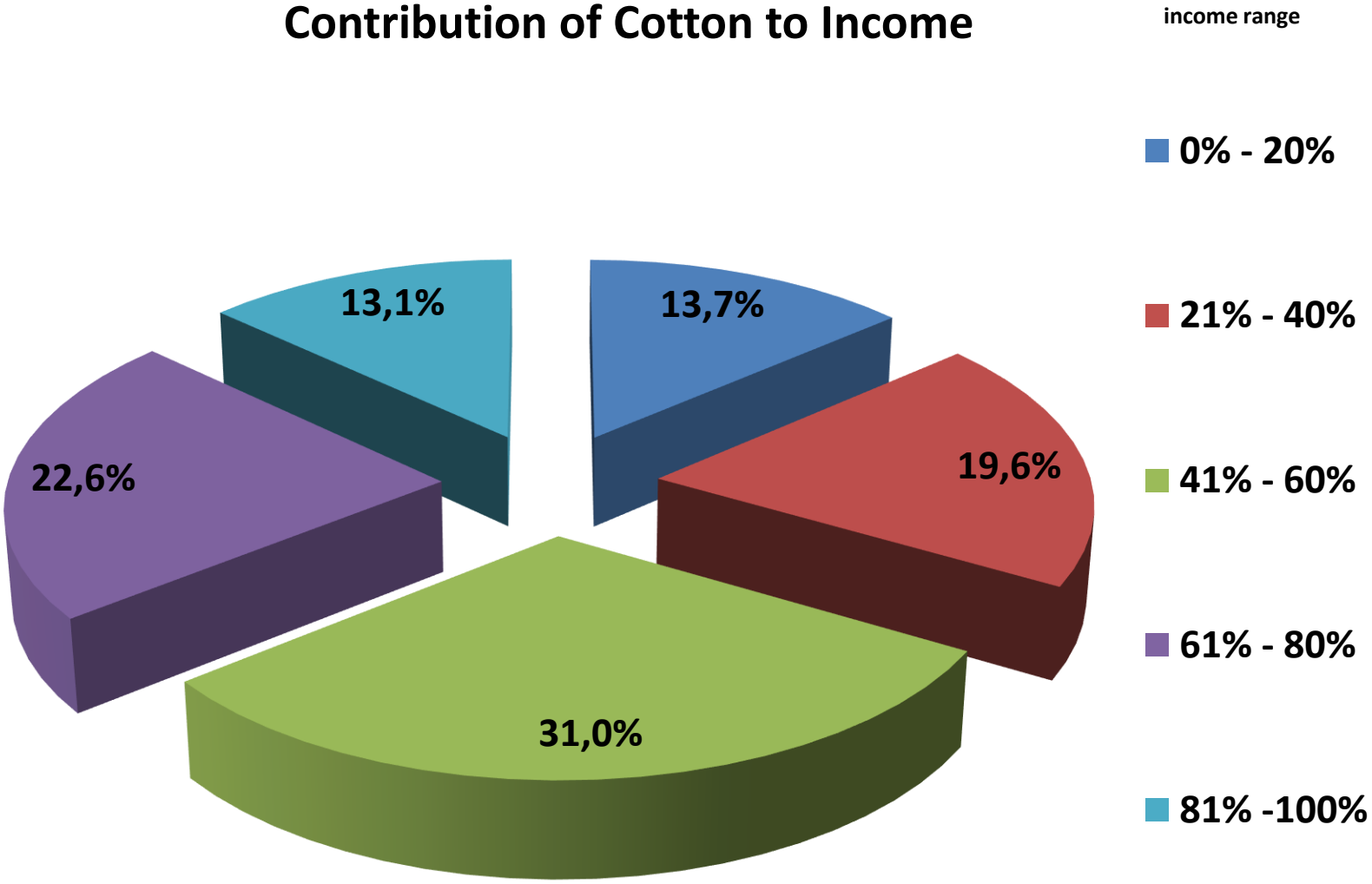




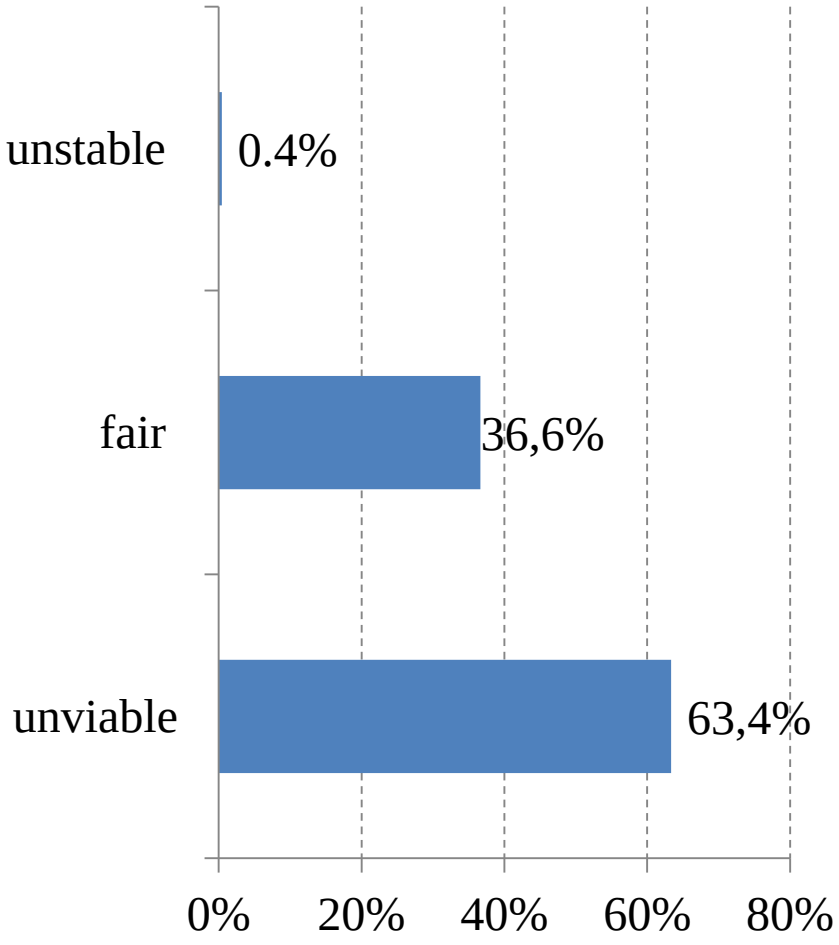

Potential value addition initiatives at farm gate level
other
0.9%
grading
1,8%
micro ginning
5,3%
contrcat ginning
5,3%
making cattle feed
13,3%
oil expression
20,8%
no idea
72,6%
0%
10%
20%
30%
40%
50%
60%
70%
80%


Factors hampering cotton production
unfair distribution of inputs
unknown pests difficult to control
abuse of inputs
late payment of farmers by ginners
politicization of the input scheme
shortage of draught power
side marketing
use of force by ginners in recoveries
cheating by ginners on inputs &…
late disbursement of inputs
labour intensive
reduced labour due to urbanisation
chemicals used endanger lives
emergency of competing crops
poor agronomic practices
shortage of inputs
erratic rainfall
high input costs
low producer prices
,4%
,4%
,4%
,9%
,9%
,9%
1,8%
2,6%
3,9%
4,4%
4,4%
4,4%
4,8%
5,3%
5,7%
25,9%
30,7%
37,3%
92,5%
0%
20%
40%
60%
80%
100%

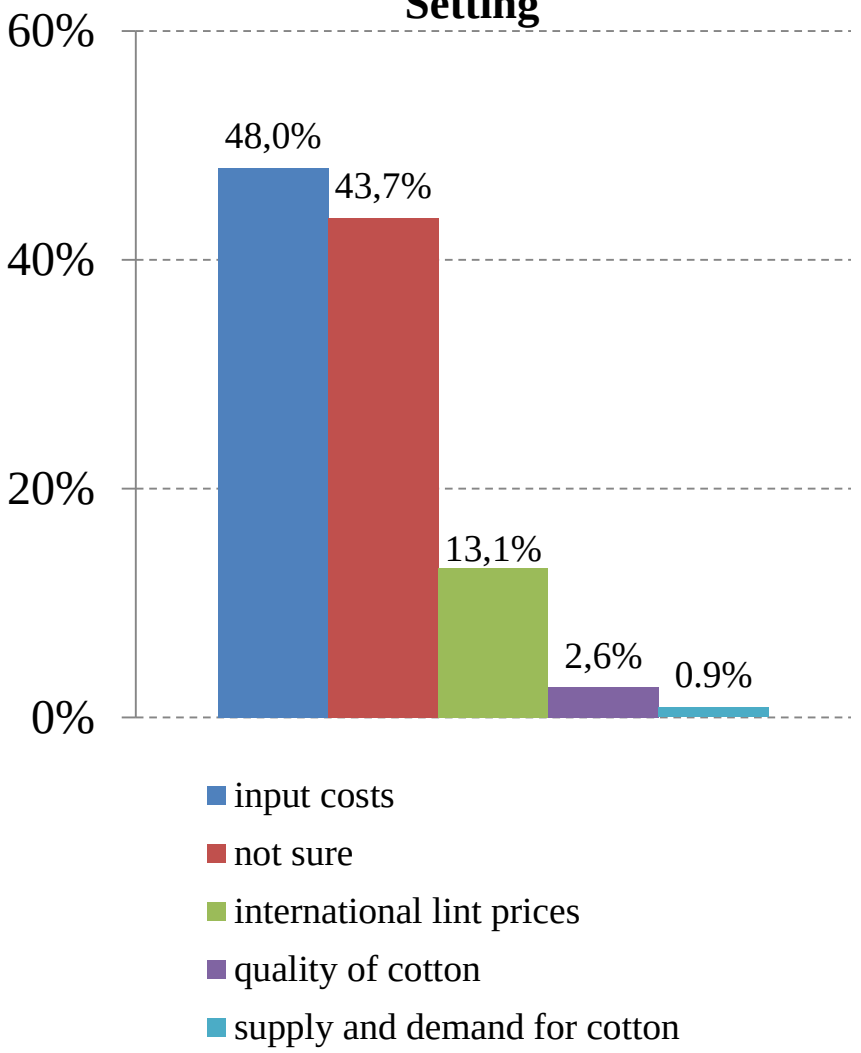
Contribution of Cotton to Income



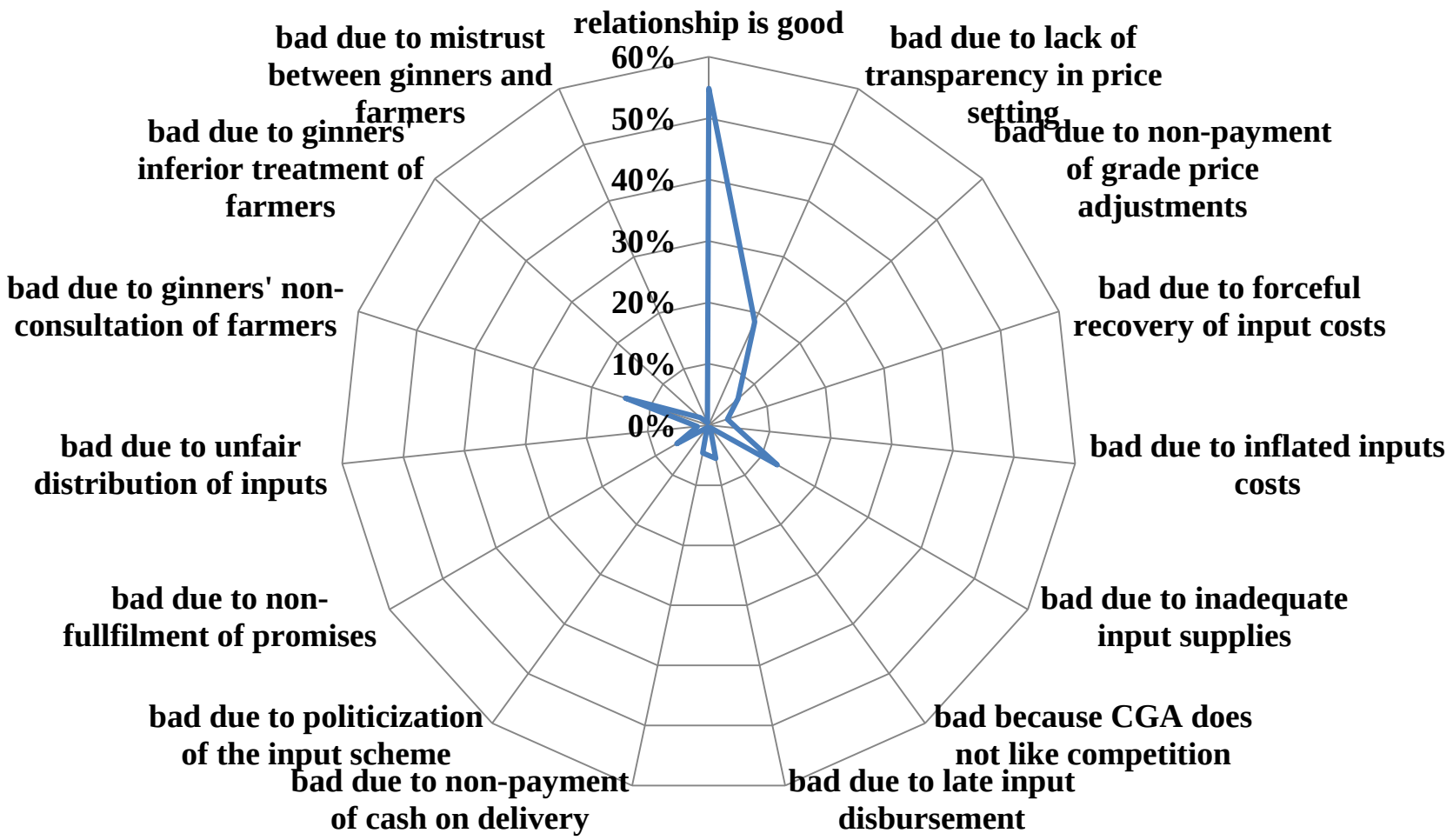
Perception on Prices



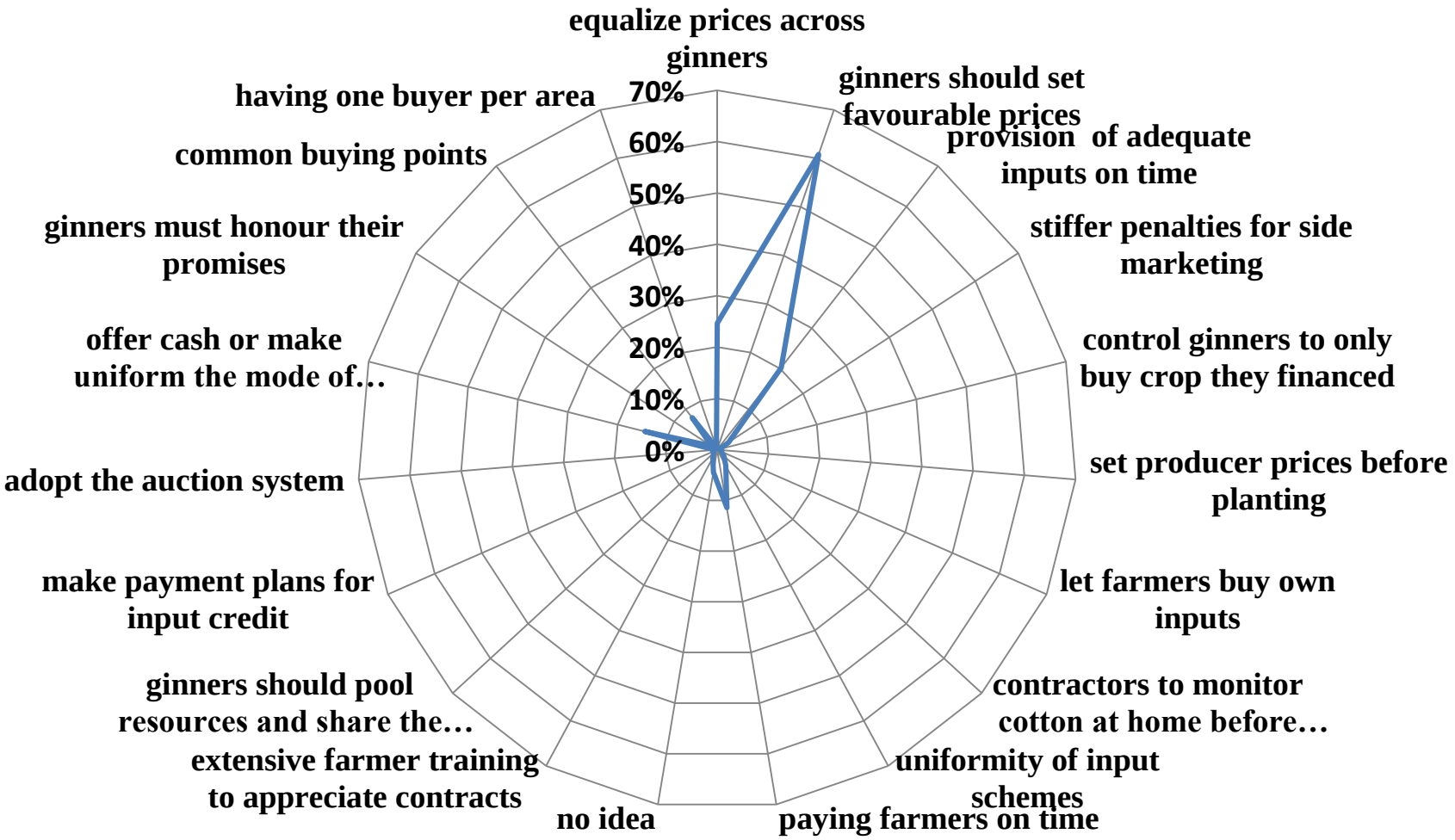
Elements Considered in Price Setting



Farmer-Ginner Relationship



Farmers' Views on How to Control Side Marketing



GINNERS' PERCEPTIONS

There is scope for more cotton by-product value addition:

- Oil expression;
- Seed multiplication for export;

Inhibitors of by-product value addition:

- Insufficient **volumes** of cotton production
- Limited **market** for finished by-products
- Lack of and high **cost of capital** discourages investment;
- Stiff competition from **inexpensive imports** displaces local production;

OIL EXPRESSERS' PERCEPTIONS

- Acknowledge that cotton by-product value chain is underdeveloped;
- Their **decision to invest** depends mainly on **availability of cottonseed as a raw material in sufficient quantities for economies of scale;**
- Inhibitors of by-product value addition;
  - **Limited availability** of cottonseed
  - **Cottonseed oil is dark**, need new technology to purify/lighten it;
  - Such investments lead to **preference of soya over cotton oilseed;**
- Cotton oilseed has advantage of **high smoke point** that enables it to **withstand a higher temperature** than many other **edible oils before burning or dissipating.**

FEED MANUFACTURERS PERCEPTIONS

Optimistic of bright prospects for using cotton by-products:

- Huge interest in raising goats due to high demand from Asian markets (1,000 goats/day);
- Presidential Input Scheme & Command Agriculture-boosting production;

Inhibitors of by-product value addition

- Limited local demand for beef and dairy feed products
- Need for foreign currency, oil expressers prefer to export cottonseed meal to earn foreign currency, despite unsatisfied local demand for cake
- Limited local availability of vitamins, minerals and other additives
- Low volume of cotton production vs other competing crops;
- **Potential risk of overpricing of cotton by-products due to the dominance of one ginner in buying cotton during the 2016/17 marketing season;**

FARMERS' UNIONS' PERCEPTIONS

Inhibitors of by-product value addition:

- Limited scale of seed cotton production
- Lack of **appropriate small-scale technology- enhancing productivity & on farm value addition**
- Lack of initiatives (e.g. cooperatives) that assemble required **critical mass of raw materials**;
- Lack of knowledge on potential value addition activities

Inhibitors of seed cotton production:

- Unfavourable prices that de-incentivize production;
- Poor agronomic practices;
- Non-adoption of efficient seed technologies (e.g. biotechnology cotton);
- Cotton contracting system is tilted in favour of the buyers;
- Inadequate input packages provided by ginners;
- High input costs of production compared to other countries;
- Registration requirements with several institutions that are not centralized
- Cotton planting seed not readily available in retail shops

AMA'S PERCEPTIONS

Factors underpinning decline in production:

- Low productivity
- Inadequate input packages
- Late disbursement of inputs-adversely affect yields;
- Low lint price due to heavy subsidies by major world producers;

Initiatives to promote production:

- Regulatory framework that ensure fairness and transparency in funding, production and marketing of seed cotton;
- Free input scheme;

Regulatory challenges:

- Ginners don't submit their returns on input funding, resulting in difficulties in implementing the quota system;

Ministry of Industry's Perceptions

Challenges hindering development of cotton by-products:

- Lack of adequate downstream value addition infrastructure;
- **Weak enabling policy and institutional environment** to support the development of cotton by-products industries;
- Poor market information on cotton by-products;
- Lack of data to **assess viability** of opportunities for investments;

Initiatives to Promote Value Addition

- Development of Cotton-to-Clothing Strategy (2014 – 2019)
  - Seeks to improve the management and packaging of cotton by-products such as **cotton motes and linters**,
  - Seeks to incentivize development of new products such as special paper from linters and other products such as **soap and margarine**
- Development of a **seed cotton pricing model** that **rewards quality and contamination free cotton**
- Promulgation of Statutory Instrument (SI) 64 of 2016 to promote value addition;

Concluding Recommendations

- Capacity building and knowledge sharing / awareness on full potential value addition to cotton and cotton-by- products.
- Incentives for boosting farmers' productivity, to create economies of scale for value added activities on cotton- by-products.
- Policy incentives to encourage investment in or adoption of technologies to add value to cotton stalks (e.g. tax credits, SEZ status)
- Building capacity of state actors and industry players to address side marketing

- Development and multiplication of seed varieties that result in improving yields
- Investing in the technology to remove gossypol from the cottonseed meal
- Set viable cotton producer prices and improve **transparency** in the determination of cotton producer prices to **eliminate mistrust** between farmers and ginners
- Provision of **adequate input packages** comprising of **fertilizer, seed, chemicals and tillage support**

- Adoption of **similar modes of payment** (i.e. cash, eco-cash and electronic transfers) and a consensus based **public pricing formula** as a strategy for avoiding side marketing;
- Reduce farmers' transaction costs by making all cotton inputs readily available in retail shops and reducing the costs of the farmer registration process;
- Rebalance the cotton contracting system which is currently **tilted in favour of the contractors**, with an adverse effect on farmers' incentives to grow cotton

- Explore and adapt the Ugandan model of a **common fund for input provision** to the Zimbabwean context to address crowding out and side marketing
- Effective monitoring by Ginners technical staff to ensure that inputs provided are accurate for the targeted hectarage and that distribution of inputs is based on **historical performance** of the farmer rather than **the hectarage that the farmer intends to plant**.

THANK YOU
TATENDA
SIYABONGA