

THE SUSTAINABLE AGRICULTURE IMPERATIVE: IMPLICATIONS FOR SOUTH AFRICAN AGRICULTURAL EXTENSION

***Agricultural extension is best positioned to
promote sustainable agriculture through five
pillars of sustainability.***

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Presenter

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Presentation outline

- Background
- Introduction
- Objectives
- Research methods
- Theoretical framework
- Challenges to Sustainable Agriculture in South Africa
- Conclusions and Recommendation



Background

Agriculture is influenced by the environment and by 'modern' farming practices

In Southern Africa severe environmental problems are direct result of modern farming practices.



Background

Need frameworks, methods and processes that support sustainable agriculture

Particularly true in South Africa with its primacy on transforming the agricultural sector.

It runs the danger of replicating the inefficient, unsustainable practices of the same past

Significant implication for South African extension to assist marginalised smallholder farmers and creating wealth in rural communities



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Introduction

Protection of natural resources

Vital for continued viability and productivity of agriculture

This paper:

Explores definition of sustainable agriculture

Discusses why it became imperative in the last decade
to focus on sustainable agricultural practices

Existing literature emphasizes three traditional
aspects of sustainable agriculture:

Economic viability

Social viability

Economic viability



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This paper expands this framework to
Five Pillars of sustainable agriculture:

Biological Productivity
Economic Viability
Protection of Natural Resources
Reduced Level of Risk
Social Acceptability

Extension should play a pivotal role in encouraging
wise (sustainable) use of the natural environment

Objectives of Paper

**Investigate existing literature on
Sustainable Agriculture and
How extension can facilitate the realisation of
Sustainable Production Practices**

**Analyze why it became imperative
to focus of sustainable agriculture**



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Objectives of Paper

Implications for Agricultural Extension

Identify challenges to sustainable agriculture in South Africa and how extension could help mitigate them

Highlight importance of preventing further degradation of natural resources



Research methods

Review of existing research papers

Bless & Higson- Smith, 1995

Merriam & Associates, 2002

Theoretical framework

Framework for Evaluation of
Sustainable Land Management (FESLM)
(Dumanski *et al* (1998))



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Research methods

Case Study Research

Blend of data gathering techniques

Literature

Document analysis

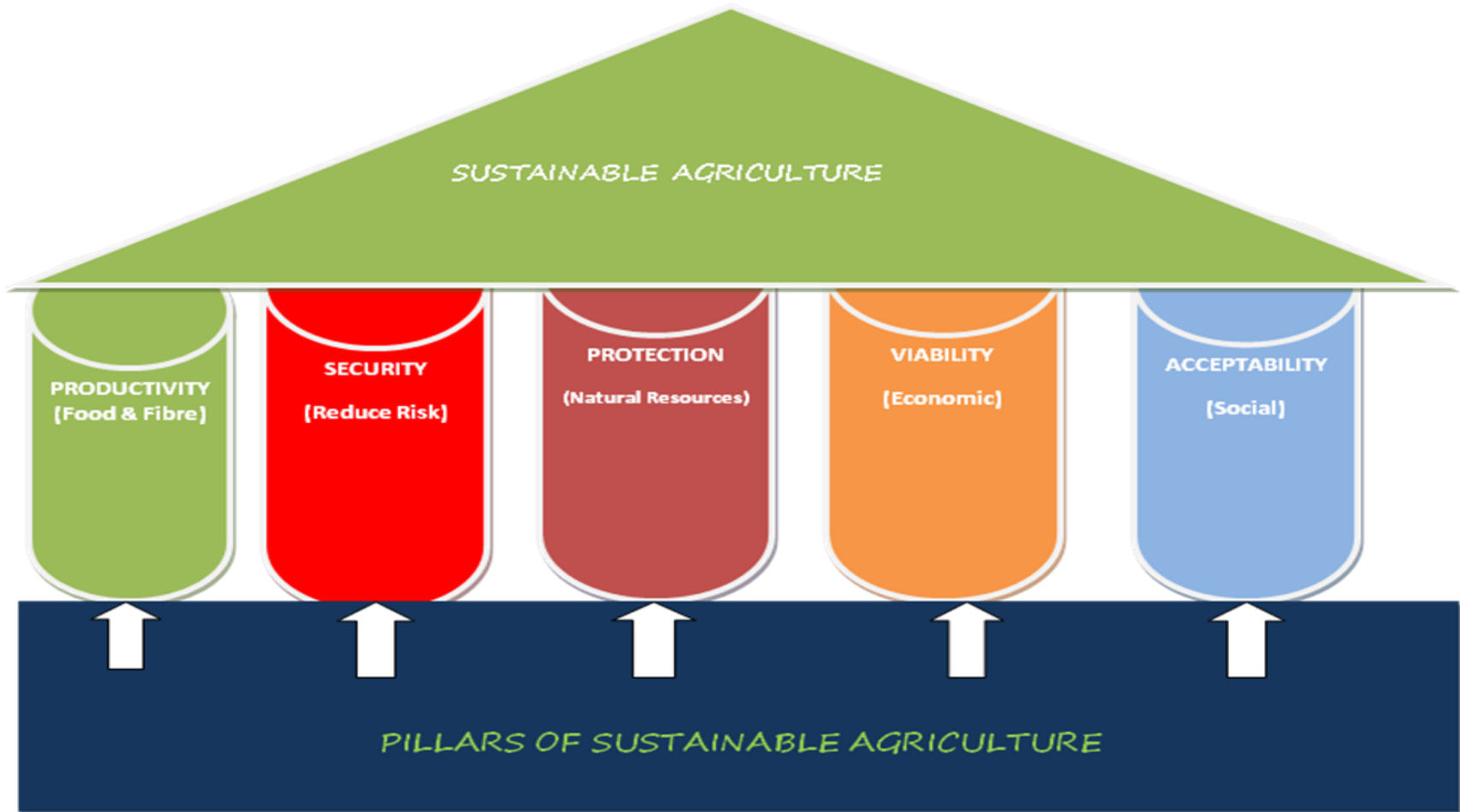
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Theoretical framework



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Discussion

Definitions of Sustainable Agriculture

Philosophy based on human goals and understanding the long-term impact of human activities on the environment and other species (Francis, 1990)

Not a return to pre-industrial methods
Not the rejection of modern techniques.

Must transcend this dichotomous view and
Operate solely from the
entrenched principles of sustainability



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Definitions of Sustainability

Aim of sustainability is to leave future generations as many, if not more, opportunities as we had ourselves.

Sustainable land management should:

Maintain or enhance production/services;

Reduce the level of production risk;

Protect the potential of natural resources and prevent degradation of soil and water quality;

Be economically viable; and

Be socially acceptable

(Dumanski, 1997)



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Definitions of Sustainability

A sustainable system as one in which:
Resources are kept in balance with their use
through conservation

Sustainability is a direction rather than destination.

First we must agree on what is to be sustained,
for whom, and for how long?

If we degrade our natural resources and poison our natural environment, we will degrade the productivity of agriculture and ultimately destroy human life on earth.

(Pearson, 2003)



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Definitions of Sustainability applied to Agriculture

Sustainable agriculture must be
Ecological Sound
Economically Viable and
Socially responsible
(Botha & Ikerd, 1995).

Coherence with 1987 Bruntland Commission

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their needs”.



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Definitions of sustainability pose challenges to
Farmers (both established and new) and
South African government,
(in particular its agricultural extension policies,
agencies and operations).

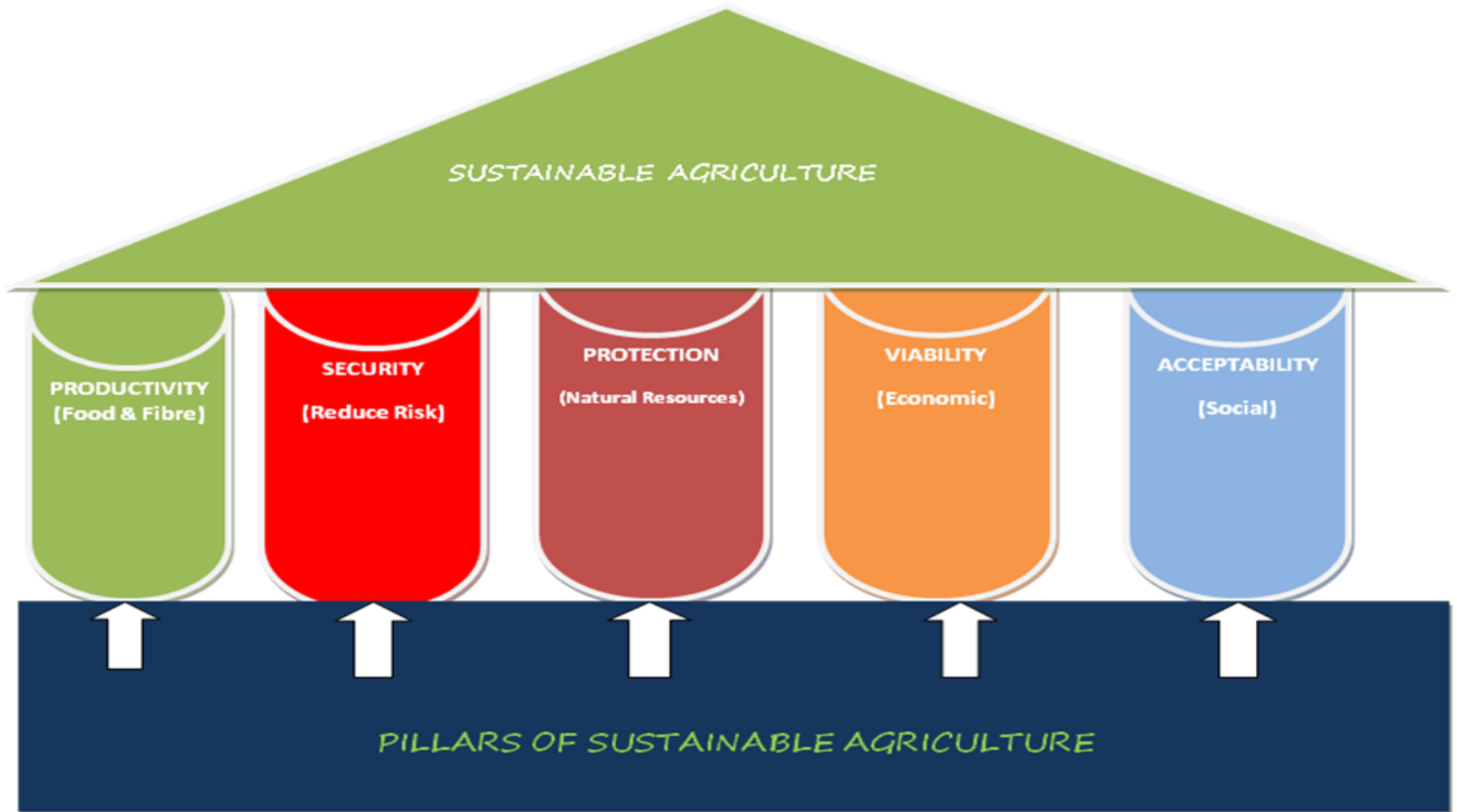
They need to be translated into
practical measures for agriculture



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The Five Pillars of Sustainable Agriculture



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Five Pillars of Sustainable Agriculture

First Pillar

Maintaining and increasing biological productivity

Biological productivity of the soil is maintained and, if possible, increased.

Increase the percentage of organic matter in the soil.

Implications

Farmers need to understand the productivity status of the soil and take appropriate actions.

These actions, must be implemented in concert with responses to the other pillars



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Five Pillars of Sustainable Agriculture

Second Pillar

Decreasing the level of risk to ensure larger security

The level of production risk must be minimised
(it can never be totally eliminated).

Implications

Matching climate and cultivar will reduce production risk.

Farmers required to take command of the risk of water erosion
through appropriate crop production operations
(Unger, 1990)



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Five Pillars of Sustainable Agriculture

Third Pillar

Protecting the quality of natural resources

Sustainable agriculture must work within the bounds of nature not against them. Pesticides pollute the natural environment.

Land degradation is driven by a combination of forces (Miller & Wali, 1995).

Implications

When farmers have a deeper understanding of how natural ecosystems function, they will be able to plan more efficient and sustainable cropping system (Francis, 1990).



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Five Pillars of Sustainable Agriculture

Fourth Pillar

Ensuring agricultural production is economically viable

The income from selling products must at least equal or exceed the cost of producing them

Economic viability must be sustained without compromising the natural environment



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Five Pillars of Sustainable Agriculture

Fourth Pillar

Ensuring agricultural production is economically viable

Implications

Challenge for South African agriculture:
shift from food production for home consumption to market-orientated profit-based farm businesses

Technological and scientific advances will help in the transition
Political, economic and institutional structures
will also have to be part of the solution.

Extension will have to help farmers develop procedures to
balance economic efficiency with long-term sustainability



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Five Pillars of Sustainable Agriculture

Fifth Pillar

Ensuring agricultural production is socially acceptable and accountable

Agricultural production and post-harvest activities must fit the society in which they occur.

Implications

Farmers will have to consider their choice of products, raw (genetic) material, inputs, and production, processing and marketing methods.

Example: Negativity regarding using GMO to increase agricultural production.



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Challenges to Sustainable Agriculture in South Africa

Challenges	Descriptions	Possible solutions
1. Overgrazing	<ul style="list-style-type: none"> •Incapacity and inefficient extension services 	Training extension on pasture management
2. Pollution by fertilizers	<ul style="list-style-type: none"> •Salination •Acidification 	Integration of both organic and inorganic fertilisers
3. Pollution by pesticides, herbicides and fungicides	<ul style="list-style-type: none"> •Destroy microbial activities •Contamination of rivers and ground water 	Integrated pest management Biological control
4. Soil Compaction	<ul style="list-style-type: none"> • Poor root development •Affects soil structure •Aeration and infiltration 	Integrated tillage management
5. Water	<ul style="list-style-type: none"> • Scarcity •Improper irrigation practices 	Training on water management



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Conclusion and Recommendations

Definition of sustainable agriculture (organic v/s technology)

Philosophy of farmers operation (farm level)

Pillars be viewed in totality

Extension can play a role in raising awareness for each pillar



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Conclusion and Recommendations

Development of policy on sustainable agriculture

Training of agricultural extension

Prevent further degradation of the natural resources

Challenges to be faced by future farmers

Challenge of food production (Growing population)



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