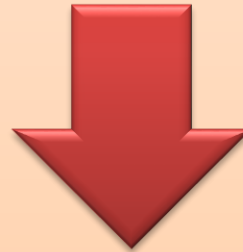
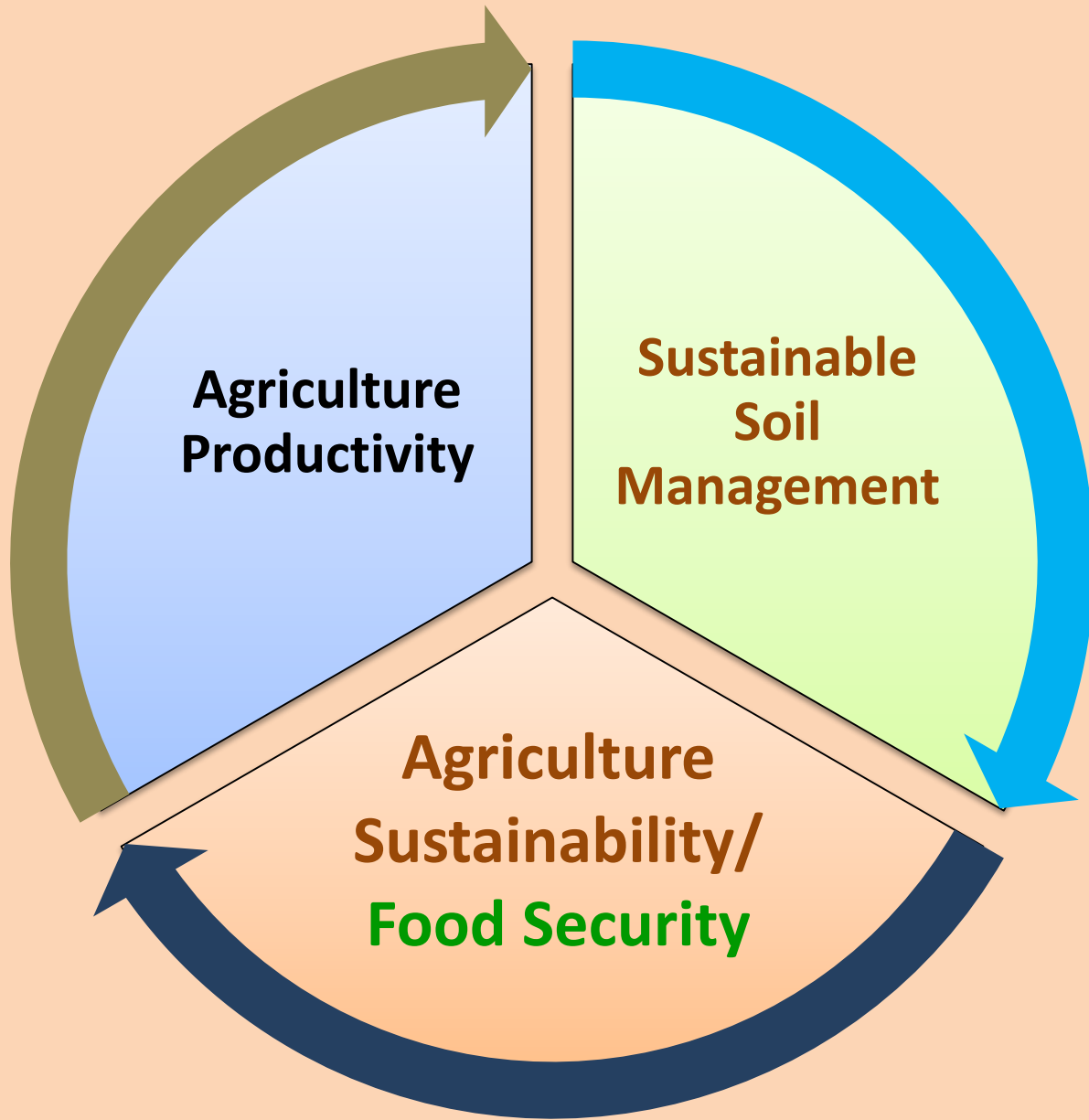


**LAND RESOURCES AND THEIR
USES IN GLOBAL AND PAKISTAN
PERSPECTIVE**

HEALTHY SOIL IS INDISPENSABLE FOR FOOD SECURITY



How Agricultural Productivity could be enhanced on sustainable basis to ensure food security for 220 million people without disturbing the ecosystem



**Agriculture
Productivity**

**Sustainable
Soil
Management**

**Agriculture
Sustainability/
Food Security**

National Soil Resources of Pakistan



Total area
79.6 mha

Arid 41 mha

Deserts
(climate hyper-arid)
11 mha

Semiarid 36.9%
Sub-humid 5.4%
Mixed 6.2%

Cultivated area
22 mha
(27.6%)

Rangelands
45.2 mha
(60.1%)

Forest area 3.5 mha

Canal irrigated 25 %
Tube well irrigated
=75 %

Salt: affected area
6.69 mha

Importance of Pakistan in World of Agriculture

- **Wheat (9th)**
- **Cotton (4th)**
- **Rice (8th)**
- **Sugarcane (4th)**
- **Mango (7th)**
- **Apricot (4th)**
- **Onion (5th)**
- **Date Palm (6th)**
- **Oranges (10th)**



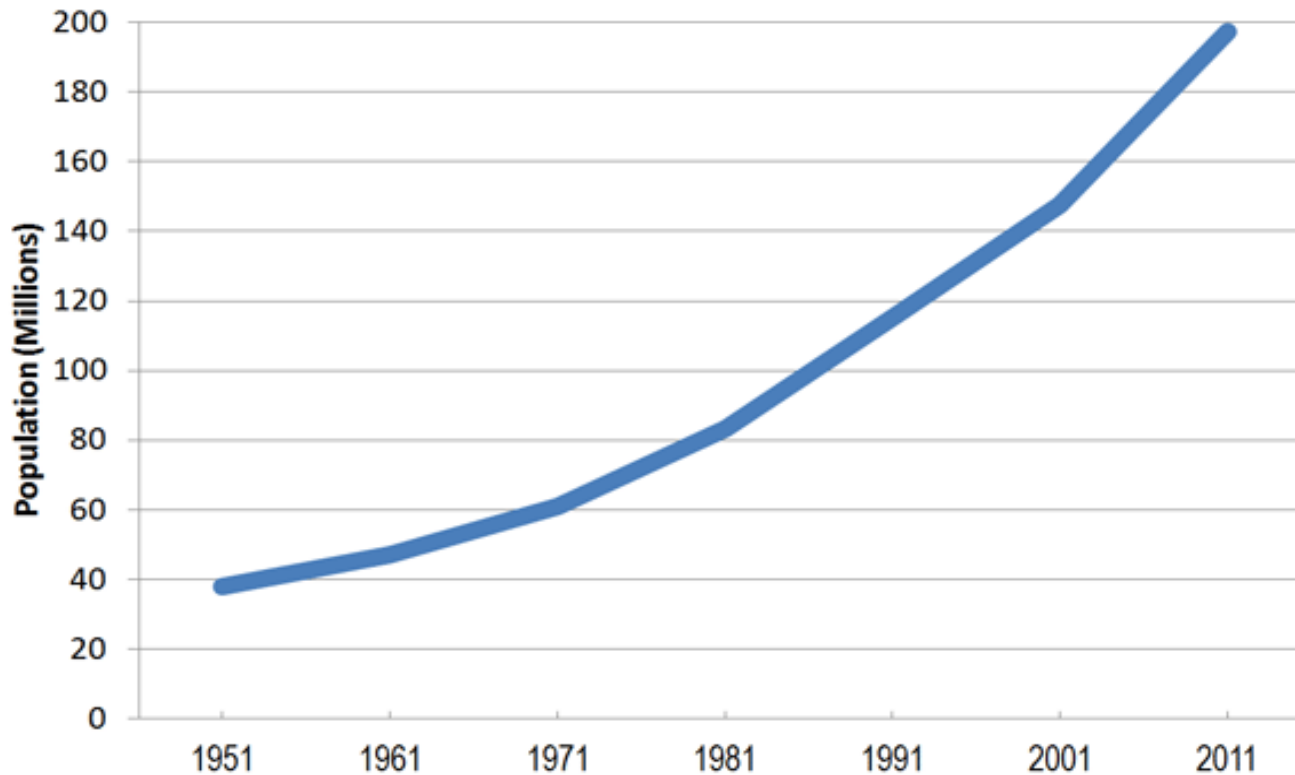
Pakistan ranks 20th worldwide in farm output.

Growth Rates (%)

	GDP	Agriculture	Manufacturing	Services
1960s	6.8	5.1	9.9	6.7
1970s	4.8	2.4	5.5	6.3
1980s	6.5	5.4	8.2	6.7
1990s	4.6	4.4	4.8	4.6
2000s	4.8	3.2	7.0	5.3
2012-13	3.6	3.3	3.4	3.7

Challenge I: Population

Pakistan: Population by Decade 1951-2011



Year	Population Million
2015	188.1
2020	203.5
2025	218.1
2030	231.7

Future crop production estimates

(m tons)

Crop	Current	2015	2030
Wheat	21.7	25.4	33.0
Cotton (m bales)	12.4	21.5	29.2
Rice	5.5	7.5	8.5
Sugarcane	44.6	-	-
Maize	3.1	-	-

Major threats and issue of Pakistan Agriculture



A) Soil Health

B) Farm Inputs

C) Climate Change

D) Agricultural Credit

E) Farm Mechanization

F) Agricultural Marketing

G) Extension Services

A) Soil Health

Salinity/Sodicity

Soil Erosion

Waterlogging

Threats

Intensive
cropping
system

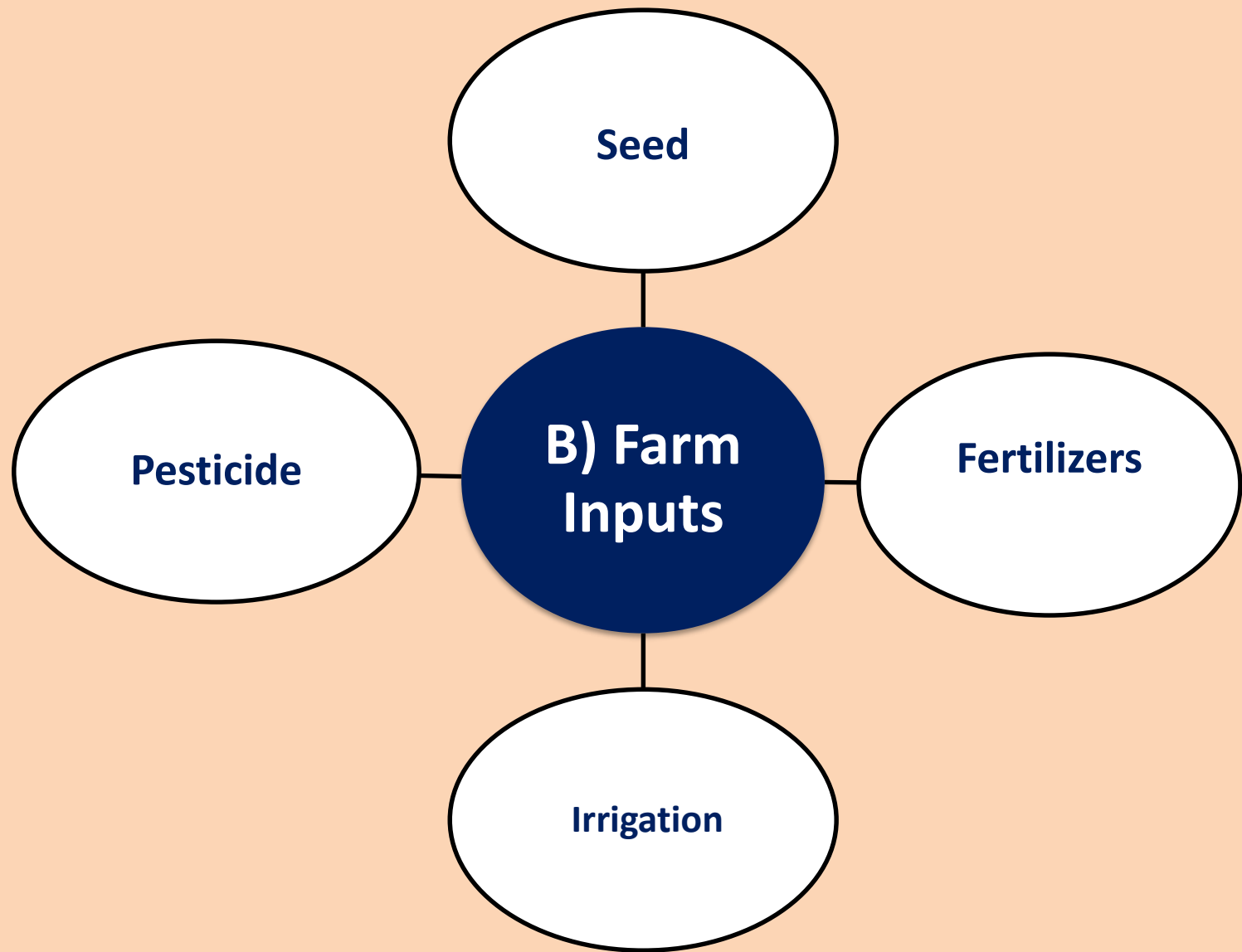
Harsh climate

Poor OM
content

Over
Mechanization

Poor
Quality water

Poor soil health is threat to Food Security



**Proper use of inputs is a key to food security/
Sustainable soil management**

1. SEED



Quantity

Seed Production is the most ignored aspect

Quality



Timely availability/Cost

Variety Development

Development of new varieties is pre-requisite for enhancing agricultural growth & food security

Non-integration
of conventional
& modern
techniques of
breeding

**Narrow
genetic base**

**Long time
duration
required**

**Lack of funding
and
government
policies**

**Professional
dishonesty**

Complicated
variety
approval
system

2. Fertilizers

Imbalance Use

Soil degradation

Fertilizer Use efficiency

Urea / phosphorus

Excessive use of nitrogen

Timely availability

3. Irrigation

Less amount available

Cropping pattern for WUE

Water harvesting

Poor quality

Water saving

Recycling wastewater

WUE

Tube-well water

Lack of planning

4. Pesticide

Quality issue

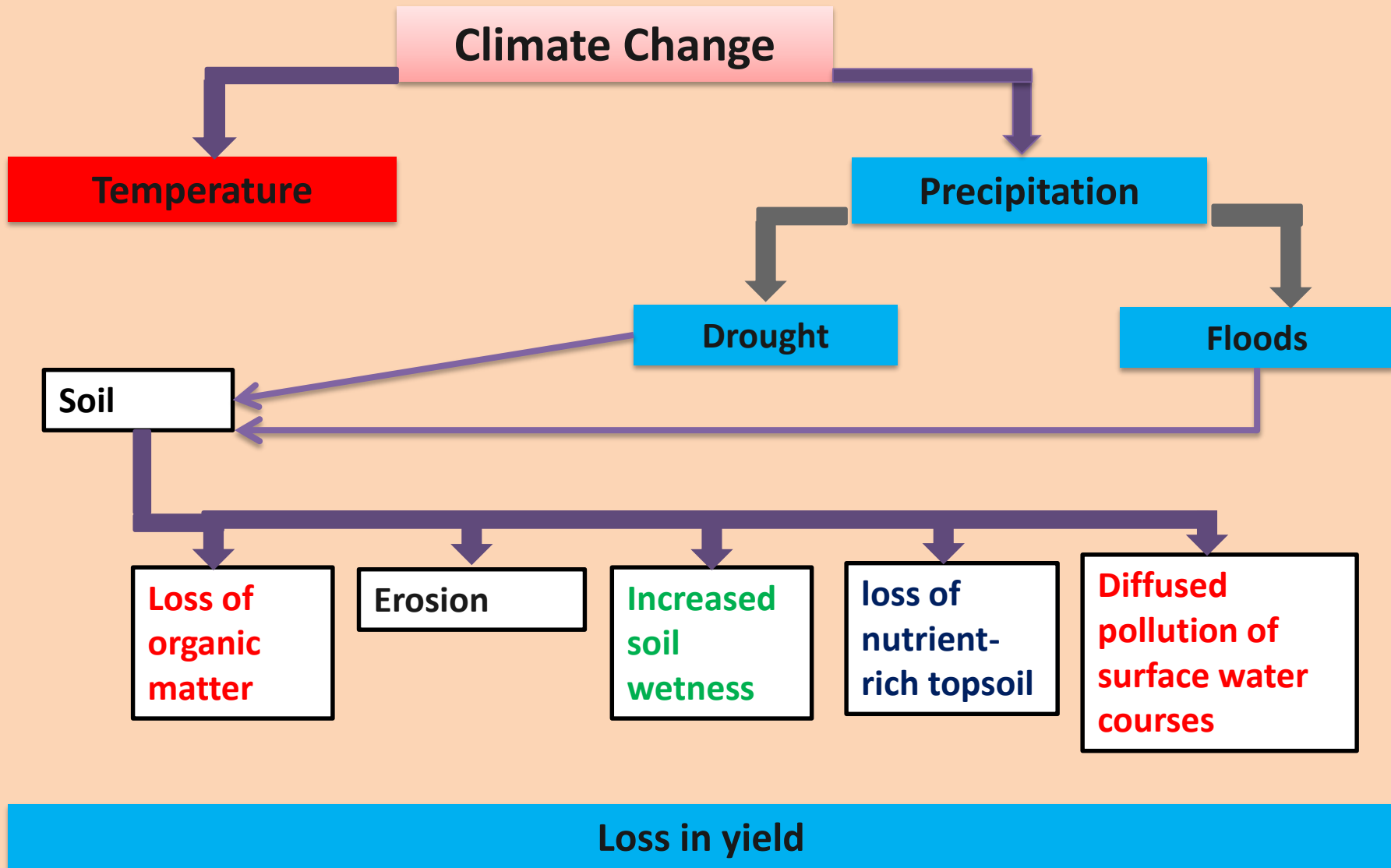
Cost issue

Environmental issue

Bio-control

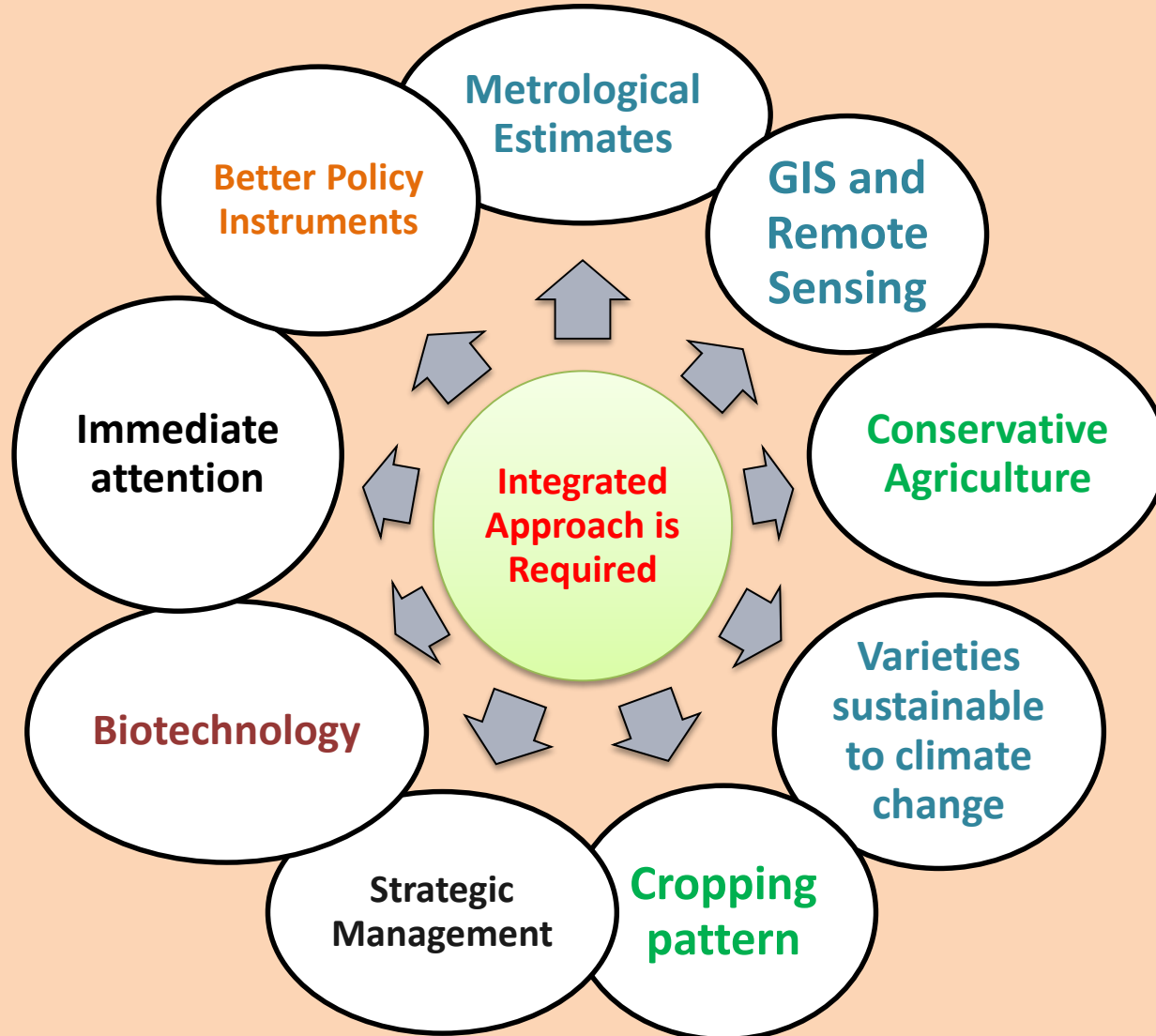
Govt. policies

C) Effects of Climate Change on Soil

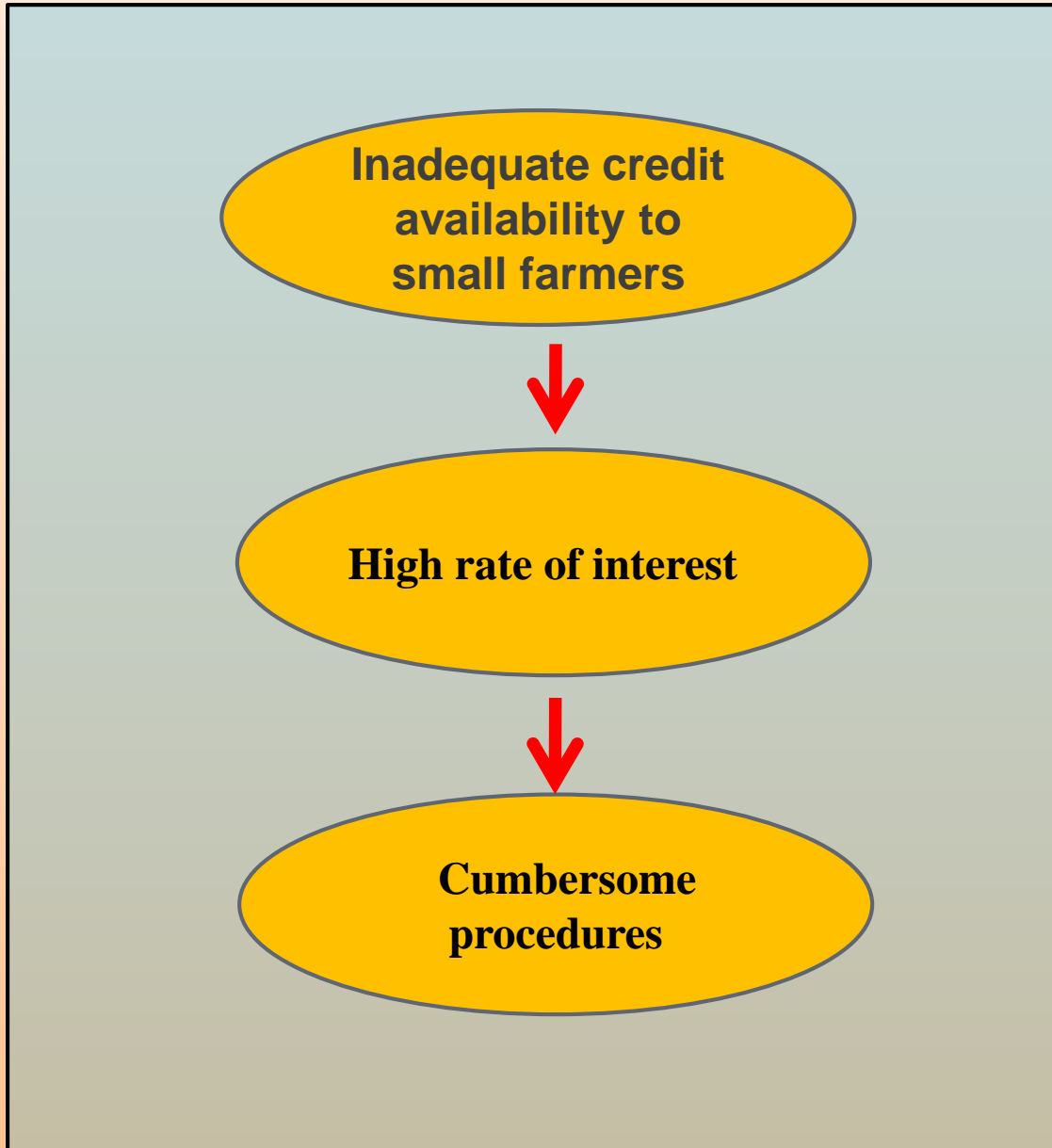


CLIMATE CHANGE

Climate change is inevitable and ever-continued. No single approach will be effective, only multi disciplinary integrated approach can work.



**D)
Agricultural
credit**



**Farmers
Face
Problems**



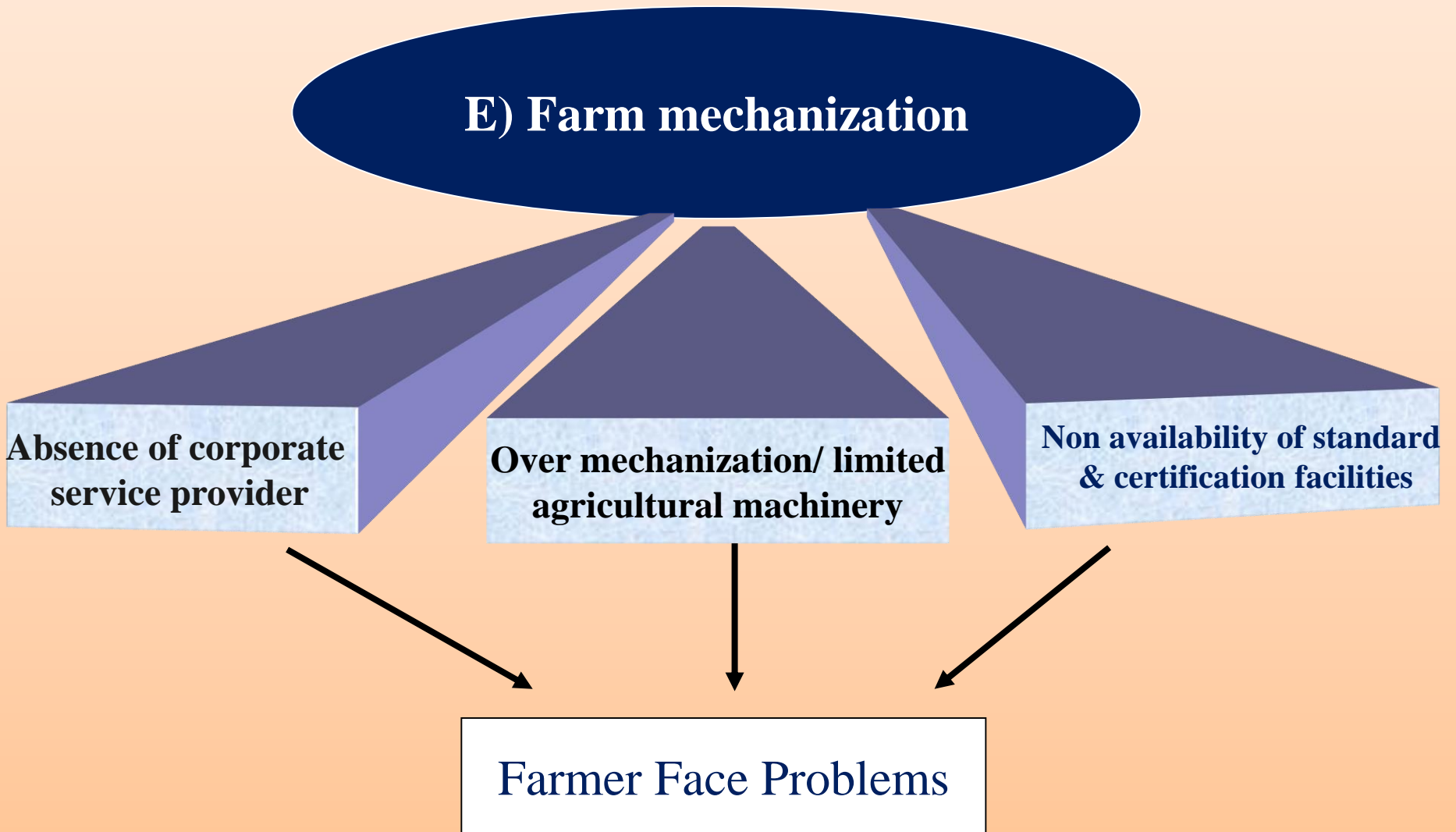
E) Farm mechanization

**Absence of corporate
service provider**

**Over mechanization/ limited
agricultural machinery**

**Non availability of standard
& certification facilities**

Farmer Face Problems



F) Agriculture marketing & forecasting

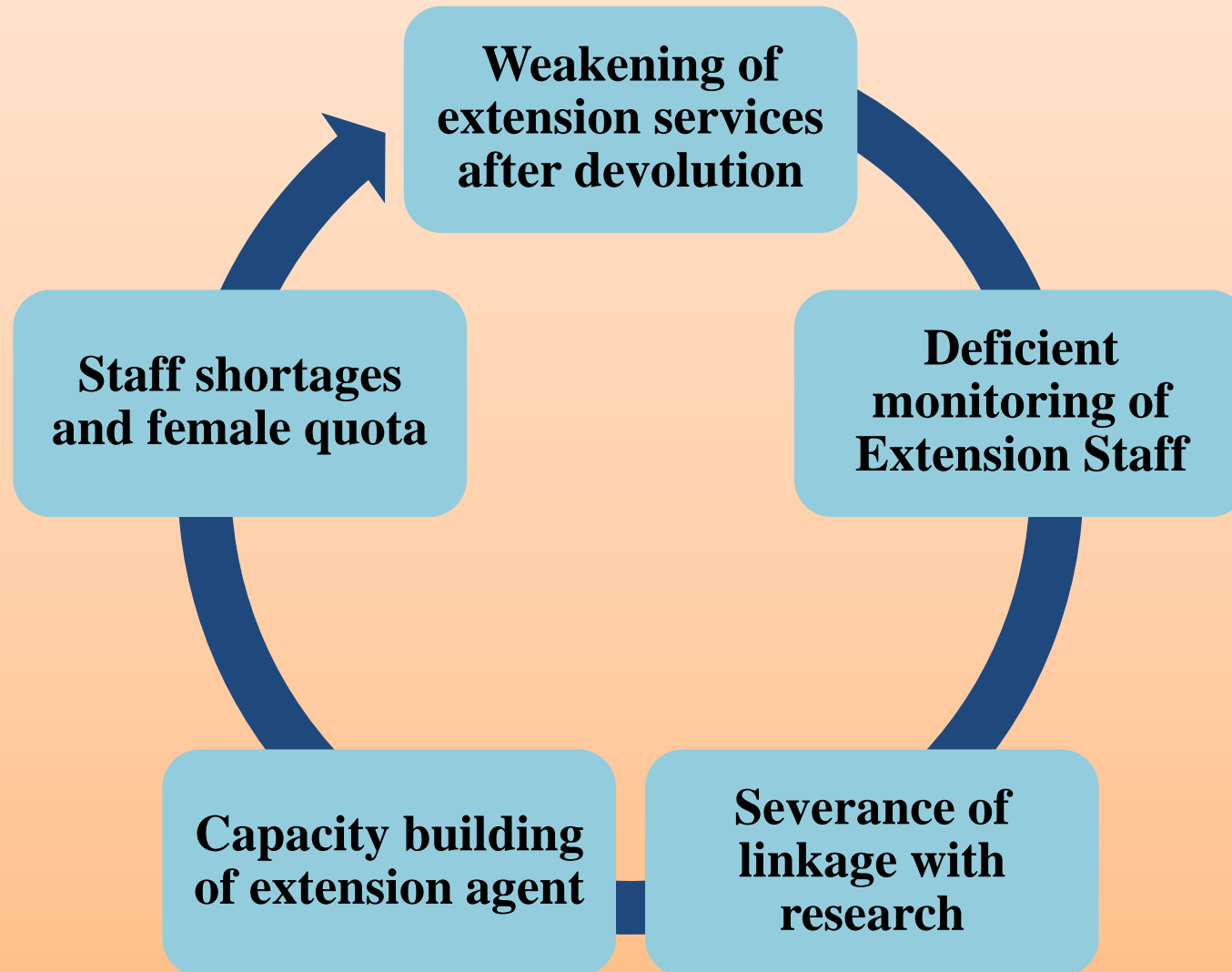
Inefficient and corrupt market committees system

Exploitative role of the middleman

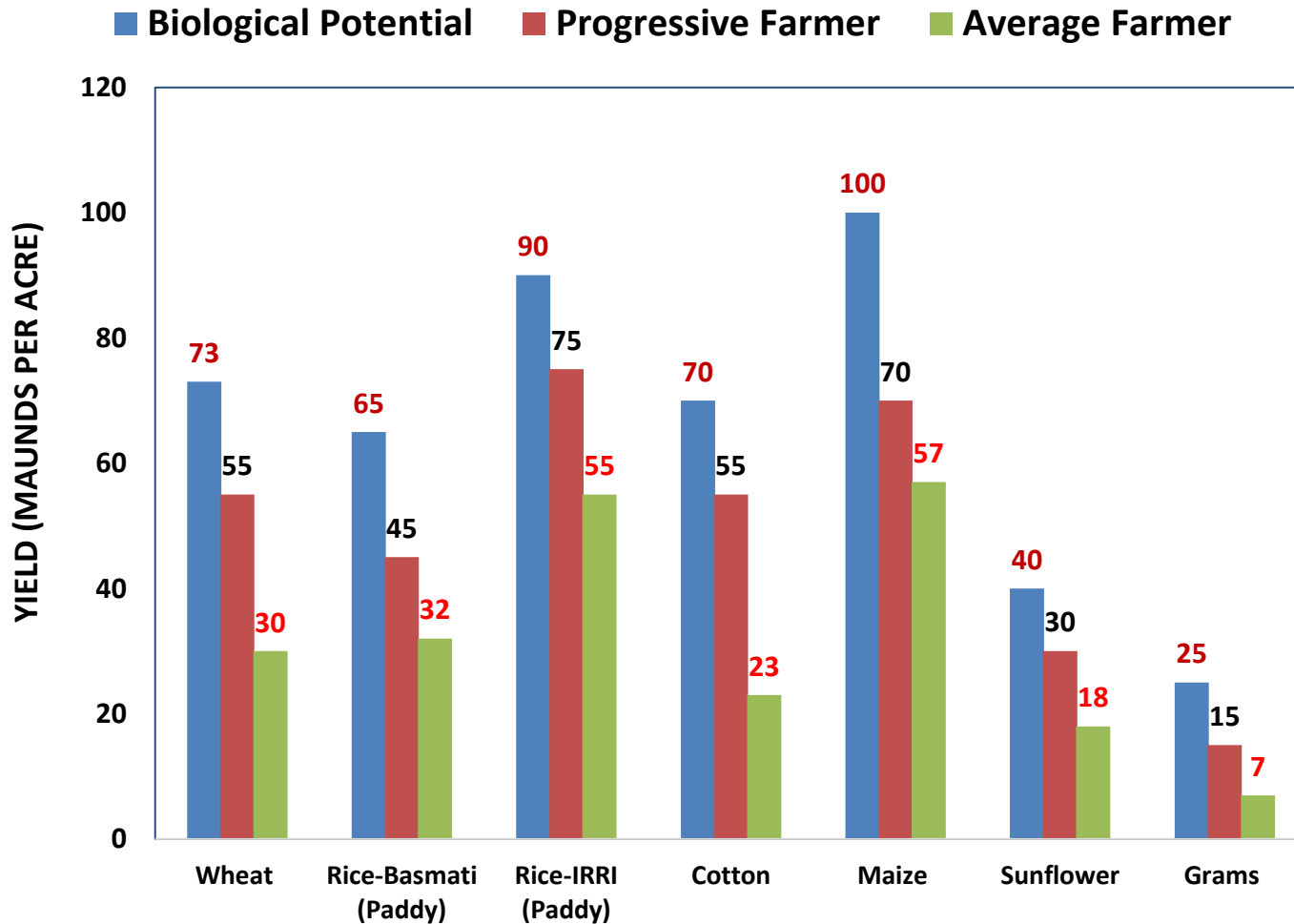
Volatility in prices of essential commodities

Poor forecasting system
No system for grading and quality premium

G) Farm Extension Services



BRIDGING THE YIELD GAP – THE CHALLENGE

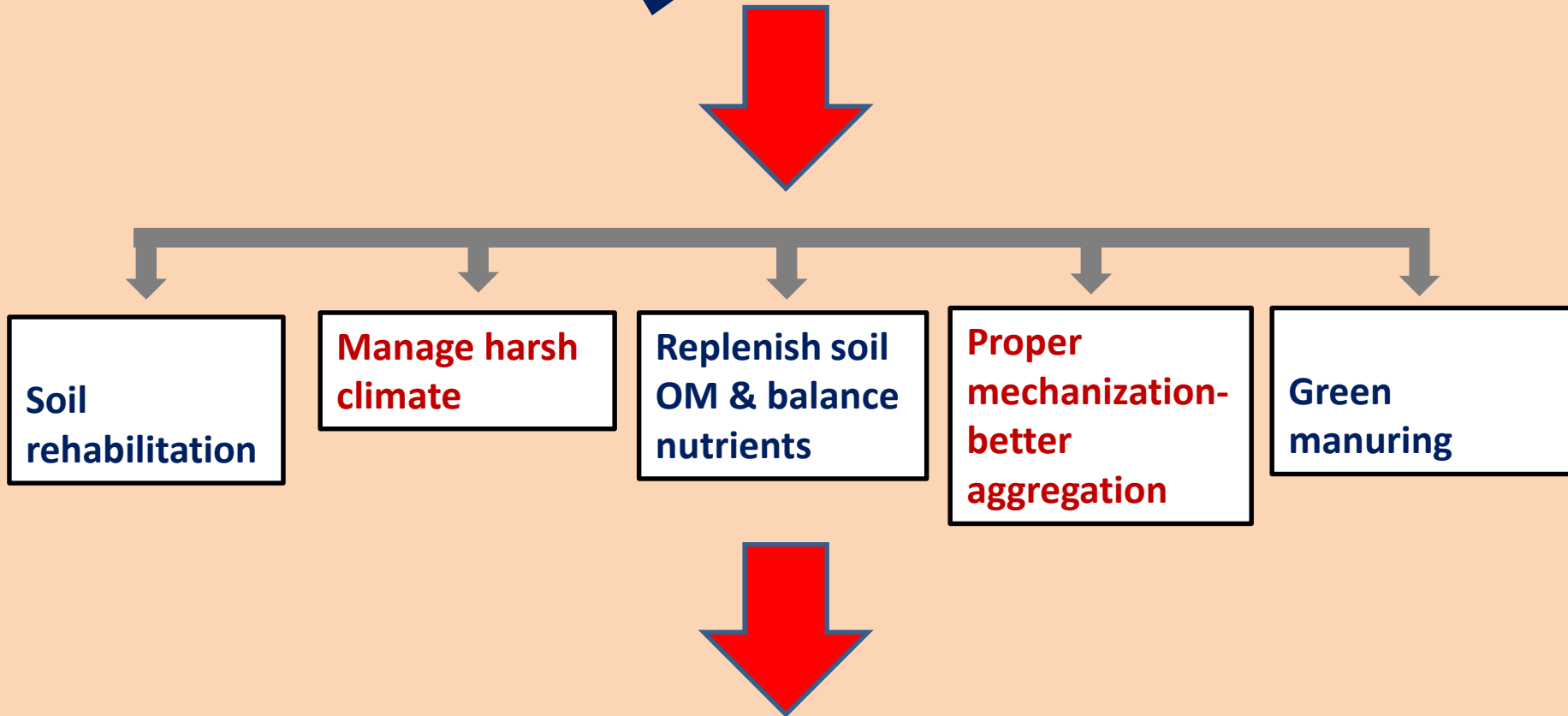


Progressive Farmers

Better information	Optimal inputs
Proactive management	Timely actions
Better networks	Quality inputs
Bigger farms	Mechanized farming
Greater economic base	Maximum efficiency

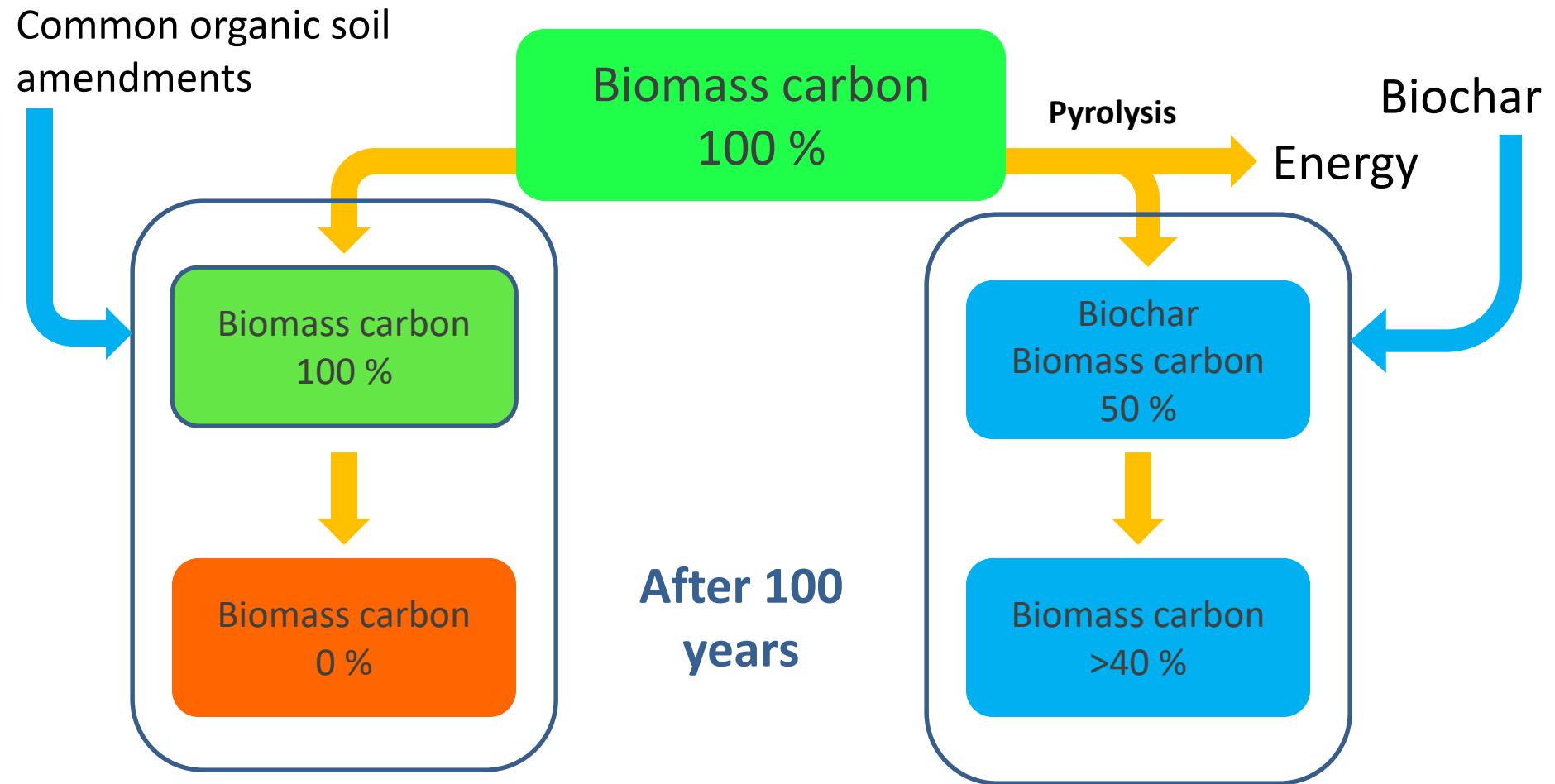
The relevant gap that can be narrowed

National Priorities for Sustainable Soil Management



Sustainable soil health management is key to food security

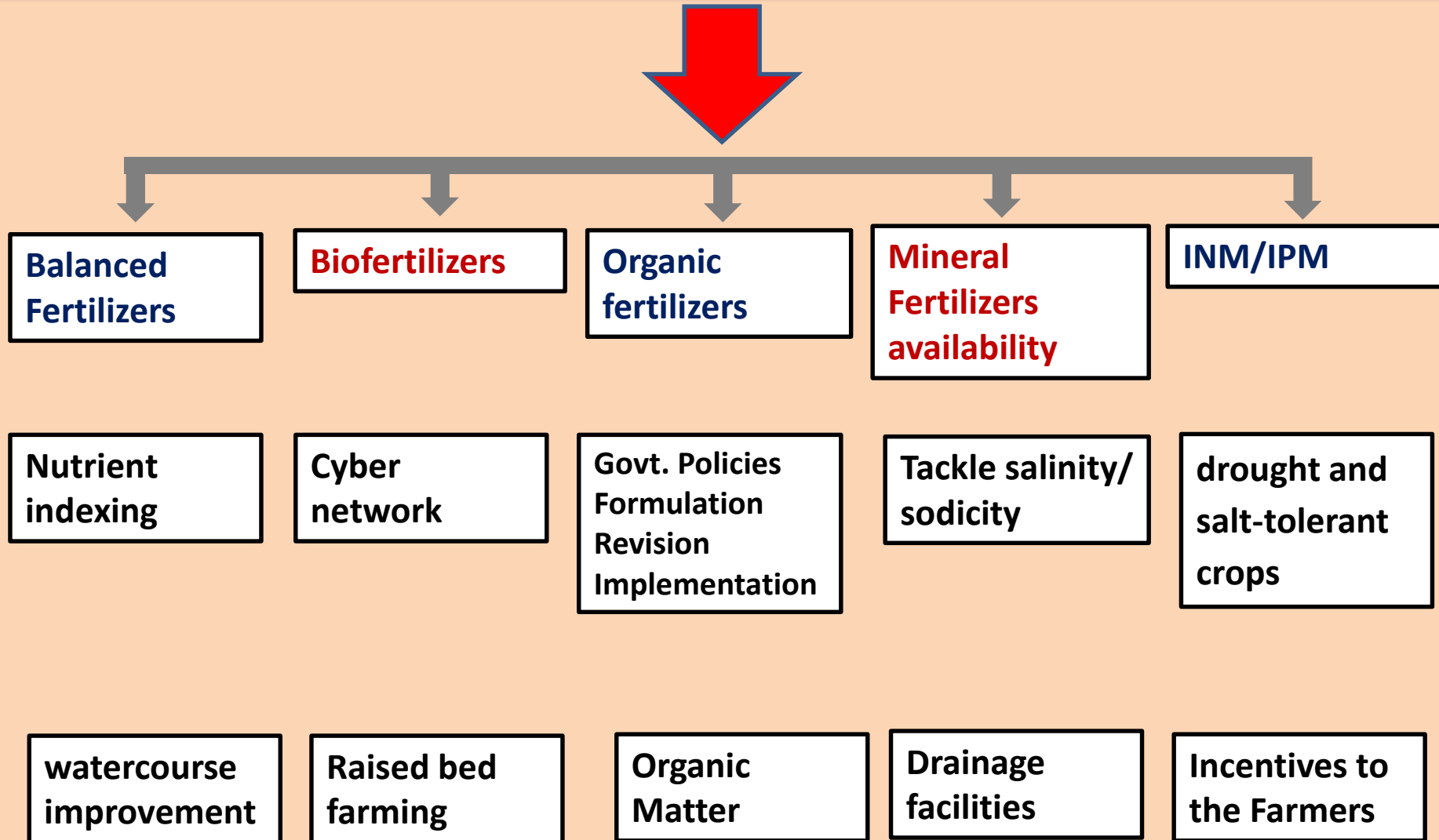
Carbon Sequestration in Soil



Potential to reduce current global carbon emissions by as much as 10%

Woolf et al. (2010)

On going activities for sustainable management and protection of soil resources



Bridging the yield gap between the potential and the present level of productivity through



**Acceleration of
seed
production**

**Timely supply
of inputs**

**Innovative
products**

**Time of
application**

**Method of
application**

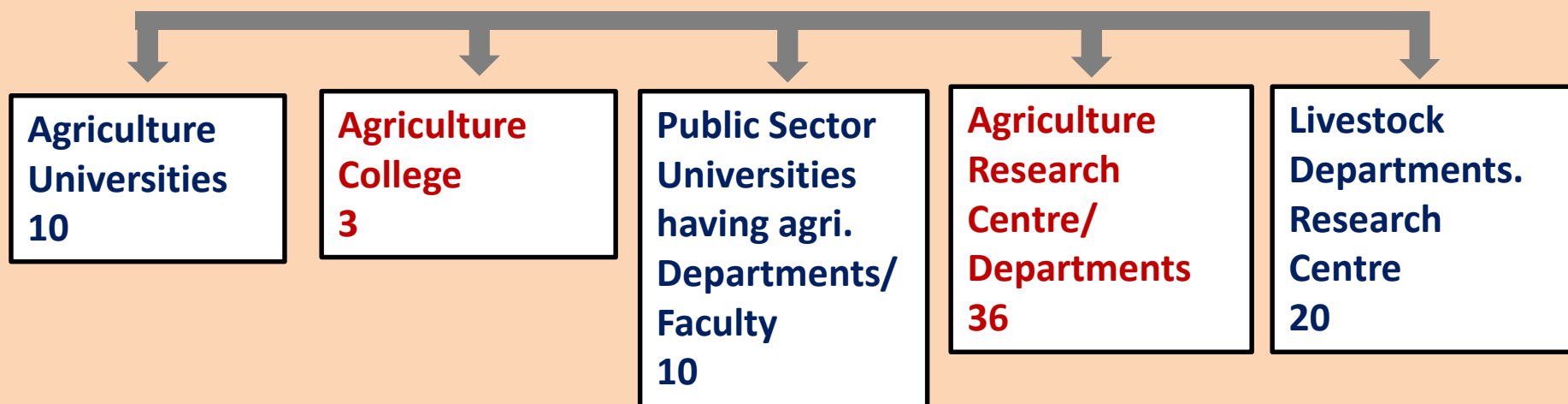
IPM/INM

**Best agronomic
practices**

**National
Policies**

**Farmers visits
and training**

Role of Research and development organizations in agriculture development



- Human resource development
- Research & agriculture development for sustainable soil management and food security

CONCLUDING REMARKS

- ❖ **Better management of soil and water resources**
- ❖ **Increase organic matter in soils**
- ❖ **Reclamation of salt affected soils**
- ❖ **Novel management techniques / climate change requirements**
- ❖ **New varieties / Hybrid and GMOs**
- ❖ **Innovative and non-traditional agriculture**
- ❖ **Farmers friendly policies (input cost, output price, export, taxation and etc.)**
- ❖ **Capacity building**