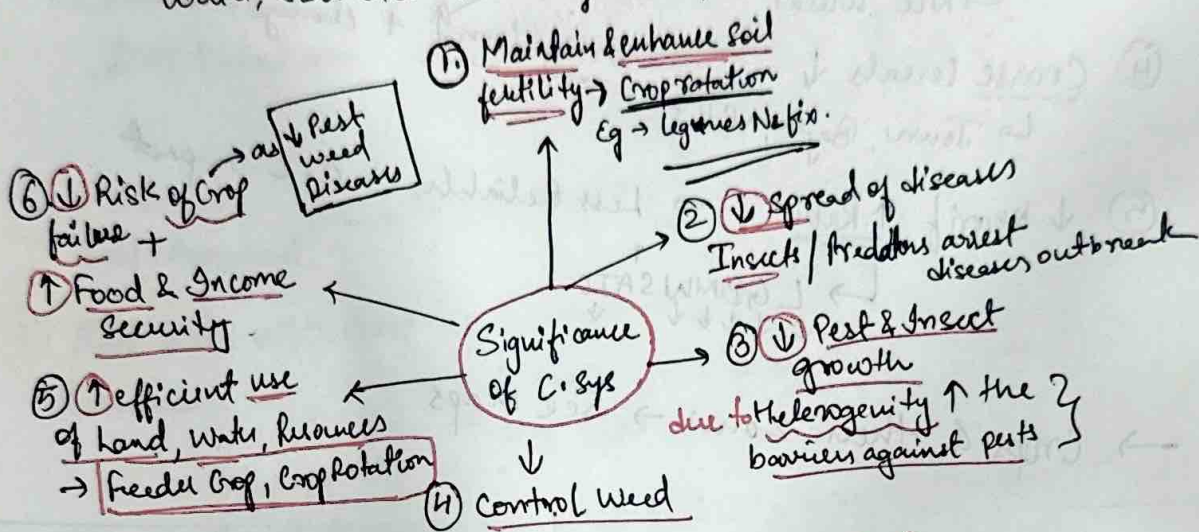


Crops & Cropping Pattern in various parts of country

→ Cropping pattern → the spatial and temporal arrangements of crops on a piece of land over a period of time.

→ Cropping systems → The cropping pattern used on farm and its interaction with farm resources like water, soil etc + management post harvest.



→ Factors Affecting C. patterns → Mainly Rain, T°C, soil, climate.

- ① Agro related → Soil, Climate, HYV seeds, Inputs (fertilizers), Ecological stability, Labour req. (intensive/net), Mgt techniques, Rainfall
- ② Economic → Market forces, Capital/Venture capital, export chances, marketing potential, Pricing for season, Financial stability of farmer.
- ③ Govt Policy → MSP, R&D flow, Biofuel, contract farm, Private sector needs
- ④ Size of land, literacy, Disease & Pest

Types :- 1. Mono Cropping

Adv → 2. Multi Cropping → 1. Mixed Cropping → No rows Random

① Better use of resource & Inter cropping → Specific Rows

② Ecological +ve → Biodiversity → Row, Strip

③ Suppress weed, insect, pest ↓

④ ↑ Yield Sequence → Rice-lotus Double

→ Rice-rice-pulses → Triple

- ⑤ Ratoon Cropping leave roots
3. Alley → Tree + crops
4. Relay → Grow crops simultaneously

$$\text{Crop Intensity} = \frac{\text{Gross CA}}{\text{Net crop area}}$$

→ No of crops in a year
→ Land area × Finer Sown
↓
Just land area

→ Cropping System → is a result of Agri + Economic + Govt + Social customs, traditions, historical trend etc

→ Trends

Reason

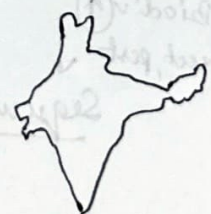
- ① Food to Non Food → Food Security ensured + Now profit sect.
Coarse crops
- ② Variety of Crops → " + ↑ Commercialisation + ↑ Demand
↳ Food, Cash, Horticulture + Plantation
- ③ Cereals ↑ among food → More HYV seeds + Price stable + Irrigat
↳ Rice, Wheat
Technology
- ④ Coarse Cereals ↓ → Irrigation ↑ + change in consumption
↳ Jowar, Bajra, Millet
- ⑤ ↓ Kharif ↑ Rabi → Less Reliable + e.c impact
↳ LGBMW SATO

→ Crops & their zones → See Maps

Rice → >25°C + Rainfall 100cm

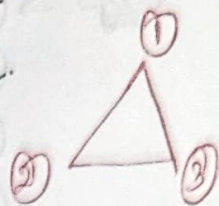
Places

North, NE Assam, Coastal + Deltaic + PJ + HR + West UP



Conservation Agriculture

* A cropping system that seeks to ensure prevention of loss to land/soil + restore degraded land.



* Based on Three Principles :- Inter-related

① Crop Diversification → ↑ Soil Nutrient/Recycling Capacity

↓
Inter Cropping or
Crop Rotation

↓ Insect, Pests
↳ waste plant ↳ Bugs

↑ Income Security → ↓ Crop failure Risk

↓ Reduce Climate Risks

② Minimal Soil Movement

→ Reduce erosion, Reduce GHG, Improve Soil Structure.

③ Soil cover with crop Residue → ↓ evaporation, ↑ soil moisture
↑ organic Decomposition → Mulch
→ Less erosion

→ Climate Smart Agriculture → ↓ GHG; Conserve Soil Moisture; Trap Soil Carbon

Green Revolution

Krishonnati Yojana → Central sponsored scheme → ⑪ sub schemes

→ Mission for Integ. Dev of Horticulture

→ National Food Security Mission + Nat Miss on oil seeds & Palm Oil

→ NM Sustainable Agriculture

→ Sub Mission on Agriculture Extension → Support State/local bodies in food sec + others

→ Seed & Planting Material → ↑ Quality

→ Agri Mechanization →

→ Plant Protection & Quarantine

→ Integrated Scheme → Agri census, economics & stats

→ Agri Co-op

→ Agri Marketing

→ National e - Gov Plan → Improve access to farmers to info,

NeGP - A

→ Operation Greens → TOP

- objs →
- ① ↑ TOP farmers & FPO access to market
 - ② ↓ Post harvest loss → create storage, logistics
 - ③ Price Stabilisation → Farmer & consumers both
 - ④ ↑ Food Processing Capabilities
 - ⑤ Setup Market Intelligence Network

→ ZBNF → Subash Palakar

→ Bijamitra, Jeevamitra, Mulching, Waaphasa

↳ No Fertilizer, Pesticide

→ Soil Moisture ^{at} all for microbes to live freely

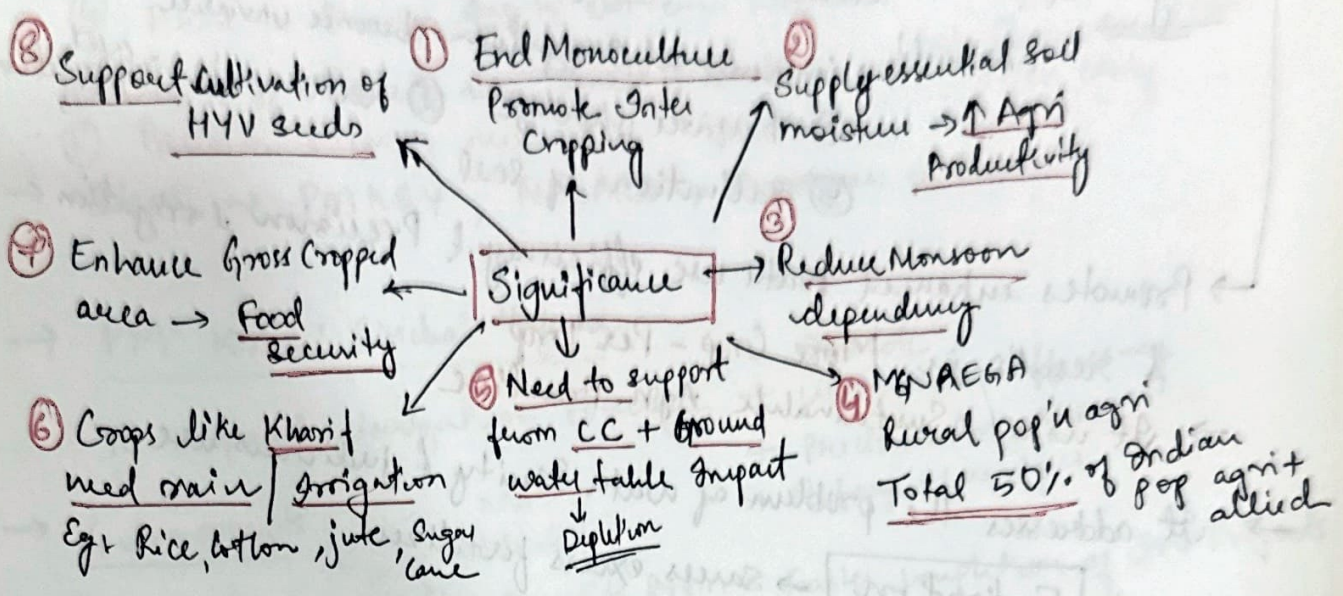
→ Features

1. Inter Cropping → Crop Diversification
2. Use of Bio-Fert & Pest → Like Cowdung, Urine
3. Use Soil moisture → Mulching + Waaphasa
4. Reduce Input cost
5. Contours & Bunds to preserve Rain
6. Replenish local water Bodies
7. Replenish earthworms → ↑ organic matter in soil
8. Use of on field seeds as inputs

⇒ Kisan Rail Scheme & Op Greens

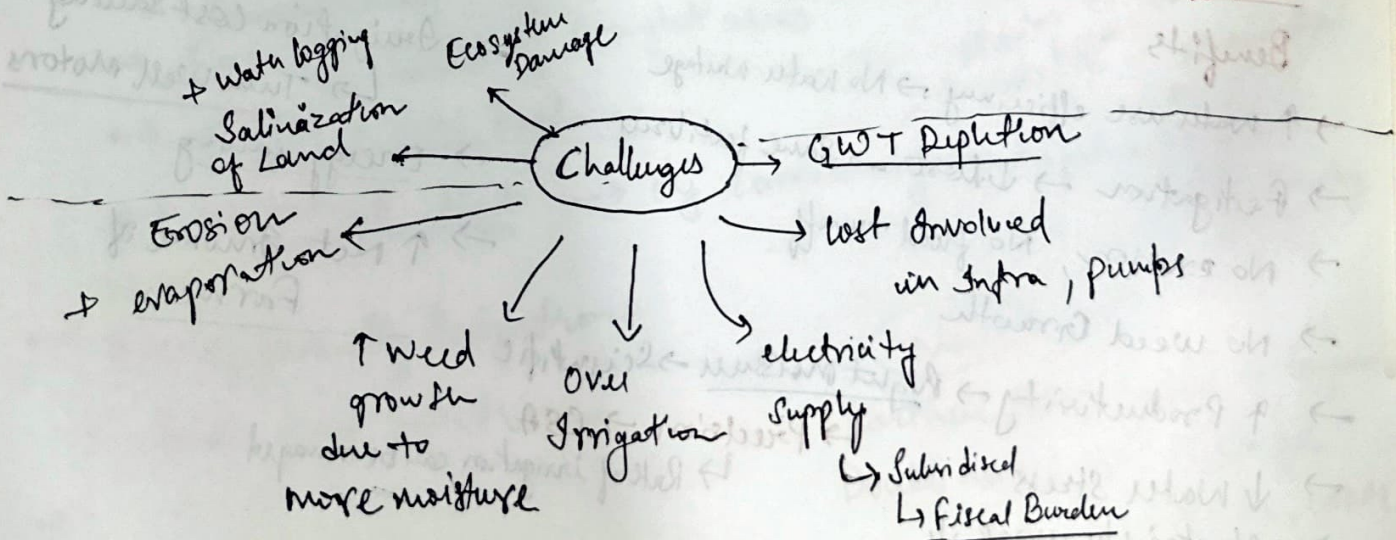
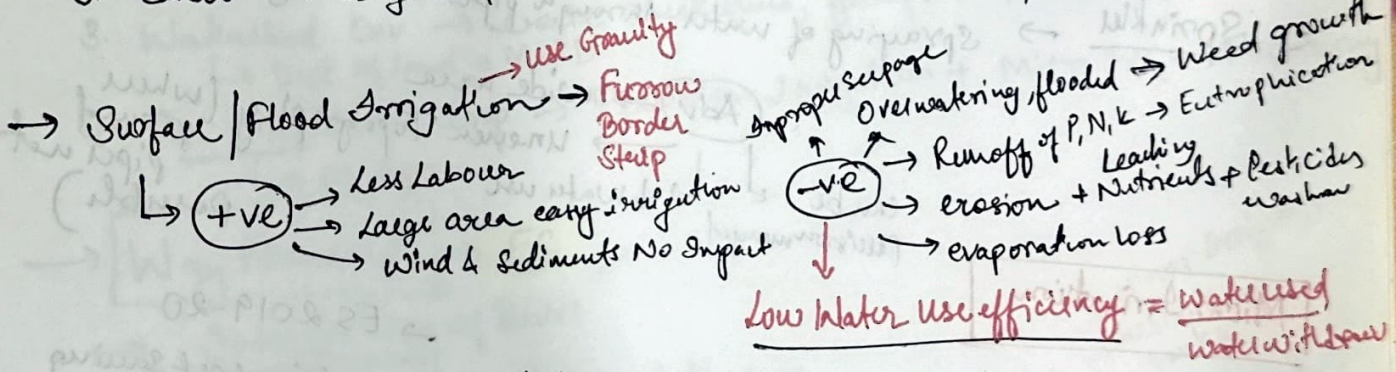
Irrigation

→ The artificial application of water to the crop at regular intervals by canals, tanks, tube wells, sprinkler etc. to enhance agricultural productivity



→ Types

1. Tanks → ^{Deccan} Peninsular + WB, Bihar, Bundel Khand
2. Wells & Tube Wells → TN, MH, AP, TL, KN, MP, UP, Punjab
3. Canal. → Gangetic plains, South & Central India → AP, KN, MH, MP, CH, OR



→ Micro Irrigation

→ refers to slow application of water on a localized volume of soil in a pre-determined pattern. to ensure **Water Use Efficiency**

Why Need? → Economic Survey 2015-16

observed → Conventional Irrigation become unviable

- ① ↑ water shortage
- ② Water waste → ^{over} Irrigation
- ③ Salination of soil

→ Promotes enhanced Water use efficiency & Precision Irrigation

& results in **More Crop - Per Drop**

→ It is a **Sustainable Agri Practice**

→ It addresses the problem of water scarcity & judicious use

+ **Fertigation** → saves excess fertilizers

Types

1. Drip → slow drop by drop application of water at root zone
↓
Sub Surface
No erosion ← **Adv.** → No evap, No runoff
use for dry land farming → Fertigation

2. Sprinkler → spraying of water through pipes creating a Rain

Adv. → wide area
→ uneven Topography (where ground pipes not possible)
can be precision managed → ↓ water use

Micro Irrigation

Benefits

- ↑ water use efficiency → No water wastage
- Fertigation → ↓ cost → Same fertilizers
- No erosion, No flood runoff
- No weed Growth
- ↑ Productivity → Right moisture → Scientific
↳ Precision → CSA
↳ Rate of irrigation can be managed
- ↓ Water Stress
- electricity usage ↓

- ES 2019-20
- Irrigation Cost saving
↳ Tube Well Motors
- Energy saving
- ↑ Net Income of Farmers

→ Challenges

① Initial cost is high

② Uninterrupted Power supply

③ Repair cost is high → No Insurance also + Maintenance

④ Prone to Damage due to extreme weather, Animals

⑤ 86% of Farmers are Small & Medium → No Farm Credit access easily

⑥ Precision Farming needs skills → special

⑦ Technical issues like clogging

⑧ Operational issues → wind, extreme T^c

→ Steps → PMKSY, NABARD, Awareness on Kisan TV

→ PM Krishi Sinchai Yojana

To expand irrigation coverage + Promote water use efficiency
+ Precision irrigation
+ Recharge of aquifers

→ 4 Components

1. Accelerated Irrigation Benefits Program + Faster completion of Irr projects

2. Har Khet Ko Pani → Rain water harvest, Regenerate of traditional source of water like Jal Mandir (Guj), Bandhas (MP)

↓
No Jal Shakti → Divert water to Scarce areas, Groundwater Mgt

3. Watershed Dev → Create checkdams, farmponds, seepage Aquifers
↳ Dept of Land → MoRD

4. Per Drop More Crop → Precision Irrigation + Micro Irr + ↑ efficiency
↳ Mo Agri

→ Way Forward → EC

→ Interlinking of River

→ Encourage Pulses in Drought areas

→ RWH + GW Recharge

→ Watershed Mgt → by Community Participation → Narmada
→ Odisha
→ Pani Panchay

→ Mission Kakatiya → Minor Irrig Infor
→ restro tanks

NITI

→ Energy friendly Irrigation

→ Better Crop Selection

New

Earthen Pot Irrigation → Haryana
Double walled Pot - Jaltripti
Bikaner, GZA

Storage, Transport, Marketing of Agri Produce & Issues & Constraints

→ **Storage** is an important market function - involve *
holding & preserving goods from **produce to consumption**

① HYV, Green Rev → ↑ Production
↑ Need to store surplus

② Ensure food security

③ ↓ Wastage due to various Reasons → **WB** → **scrap waste due to improper storage** → **food 1/3 not would pop**

④ Quality loss

⑤ employment generation

⑥ Empower rural economy

→ Ensure continuous flow of goods → **Post harvest cold storage**

→ Prevent quality deterioration

→ Price stabilisation efforts

→ Better Price Realisation to farmers

→ Meet emergency needs

→ **Need? Benefit** → **Constant supply of Raw material to FPI**

* **Buffer Stock** (4 Goals) → **Food Security**
↳ **Market Intervention**
↳ **TPDS + other schemes**
↳ **Emergency** → crop failure, disaster

↳ **PAOBin**
↳ **PUSA Bin**

→ **Types** → ① **Underground** ② **Overground** ③ **Improved** → **Hapus Tekka**

→ **Warehousing** → is a scientific storage method to preserve Q & Q both

* **Scientific Preservation**

→ **warehouse receipt** → **Financial credit**

→ **Market Intelligence to users**

→ **Price Stabilisation**

Role

Type → **ownership** → **Public**
↳ **Private**
↳ **Bonded** → **airport seaport**

Commodity → **Food**
↳ **Refrige**
↳ **Special**

* **CWC** → **Central Warehouse Corporation** → **WCA Act, 1962** → **statutory**

↳ Provide reliable, cost effective, value added, integrated warehousing & logistics in a **Socially responsible & Environmentally friendly** manner

⑥ **Special structures to preserve hygroscopic Horticulture**

⑦ **Maintain WH clean, fumigation, etc**

⑧ **Scientific Storage of Spices etc**

Functions

① **Build Godowns, warehouses**

② **Run WH to store crop, seeds etc Fertilizers***

③ **Act as agent of govt**
Purchase, sale, distribute

④ **Product** → **Transport facilitation**

⑤ **Share** → **50% State WHC Capital**

→ State Warehouse Corp → 50% state govt
50% CWC

→ **WIDRA** → 2010, under WIDRA act 2007 → Statutory

↳ Main obj → Negotiable warehouse receipt system
↳ avoid panic, distress sale

→ **FCI** 1964 Act → statutory

- ① Price Support to Farmers
- ② Food security (Buffer stock)
- ③ PDS

- ① Decentralized → FCI
- ② Decentralised → By states
- ③ Open Market Sale
15-20% wheat of that year
12-15% Rice "

→ Procurement of Food grains

MSP
NFSA
↓
Fair Price Shops

* Every year → FCI procures Food grains & state agencies
* Open ended procurement
No limit, market distortion

"First in - first out" not followed

Issues

Excess stock → Needed as Reserves for food security
Fiscal stress

Poor Storage facilities + Inadequate Storage + Low Investment + Unscientific Mgt

"-ve" impact on training
Domino effect
excess wheat Rice

Imbalance in storage facility
Lack of warehouse in consumer states → ↑ Cost of Procurement

→ Reduce transit loss
↳ container movement

* * Shanta Kumar Committee → Reco to FCI

- 6 Allow private players to procure
- 7 Stop Fertilizer Subsidy & give DBT
- 8 Stop Bonus MSP

① Outsource stocking operations to EWE, WORA SWL etc

② Liquidate & Monetize excess stocks in export markets
↳ automatic trigger mechanism

③ **Promote Innovation** at every stage like procurement, distribution, Stocking, Transport
↳ Reduce cost *

④ Handover procurement to states that have gained experience

⑤ Negotiable warehouse Receipts Importance

enWR + NWR

→ Cold Storage

India → 1st in Fruits, 2nd in Veg Production
but losses of about 25-30% of Produce

due to perishability

↳ Solⁿ → Cold Storage.
↳ Fruits, Veggies
↳ Dairy, flowers

→ India's diverse climate favours all crops
but cold storage is key in reaping the benefits

→ Govt Initiatives

① Under NHM (Nat Horticulture Mission) for assistance ✓

② Nat Hort Board → Capital Investment Subsidy ✓

③ APEDA → scheme for Infra Dev → pack houses
cold

④ Technology Mission to NE, Sikkim
for Integrated Dev of J&K, HP, UK
Horticulture

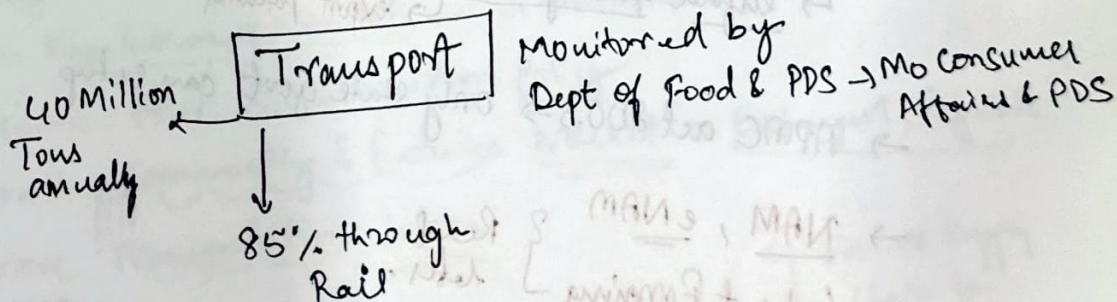
⑤ Agri Infra fund for post harvest infra

→ National Policy on Handling, Storage, Transport of Food Grains

→ Integrated Coldchain Availability Platform
↳ Reduce losses

↳ By NHB, APEDA, MoPFI

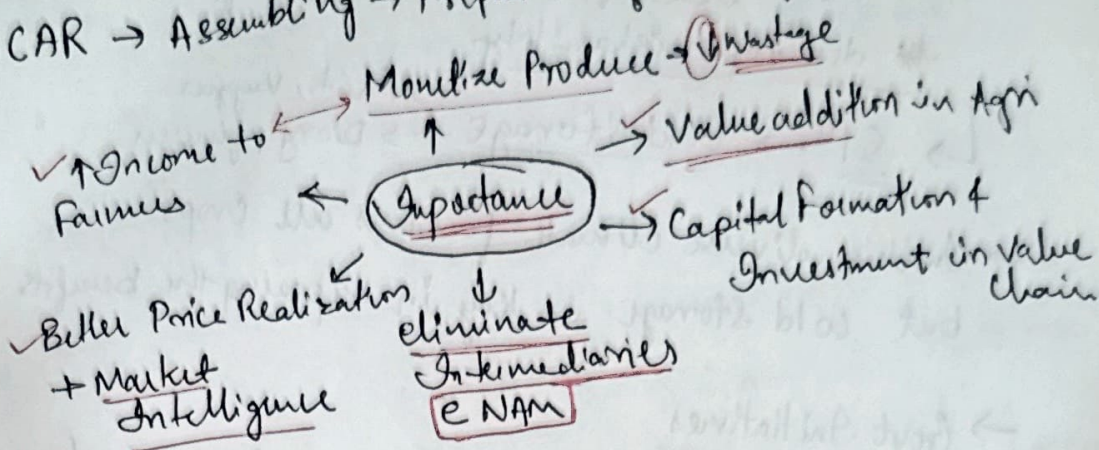
↳ National Database → link Coldchain owners
users collab



→ Agriculture Marketing

* Process of buying & sellings in market.

→ ICAR → Assembling → Preparation for consumption → Distribution



→ Types of Markets → ① Traditional

② Co-op like Arund Patkun
Kerala Horticulture Dev Progr

③ eNAM

④ FPO

⑤ Contract

⑥ Commodity Trading

SEBI
Options & Futures
MCAPDS → Nodal

→ Regulate Markets? why?

↳ Prevent farmer exploitation

↳ Better remunerative price → ↑ Reinvestment in Agri

↳ Elimination of unhealthy practice

↳ +ve production both quality + quantity

↳ ^{way to} enforce quality stds → monitor quality of produce
↳ export potential

→ APMC act 2003 → only state govt can setup

→ NAM, eNAM } Read later.

→ Contract Farming } Read later.

→ AGMARKNET → price, arrival info from APMC,

→ FPO's formed

→ Market Intelligence & Early warning system

→ Issues w.r.t Agriculture Markets

1. Institutional → License Barrier → compulsory req. to own shop/ godown issues
→ Higher incidence of Market charges (use fees)
→ No Grading Mechanism → so even good quality of Bad quality Price Realisation
2. Infra Issues → Poor Infra APMC
Poor cold storage, Yards, No grading facilities
→ Economic viability low as ROI takes time
3. Market Info System Issues
 - Lag in Demand Signals → Data not updated real time
 - Limited Info channels / content on Prices etc
↳ Newspaper, APMC Boards
 - Poor awareness about info to farmers
↳ SMS, RT voice info
4. Limited Public Inv
5. Absence of National Integrated Market → fragmented supply chain
6. Malpractices, Cartelization, middlemen → Vested interests

→ Way Forward

1. NITI AroGh →
 - ① Remove shop rule ✓
 - ② Private Mandis & Direct Markets ✓
 - ③ Take Fruits & Veg out of APMC ✓

→ Eg: Rythu Mandi AP, Bazaar
Apri Mandi → Punjab
Uzavar Samthalgal - TN
 2. Integrate Domestic & International Markets → allow free trade No Barriers
 3. Strengthen cooperative societies in Marketing → FPO's ✓
 4. Better Regulation of Markets ✓ → Middlemen
 5. Reframe Price - Stabilization Policy
 6. Promote commodity & futures Market → Exchanges ↑, Regulate
 7. Improve Transportation infra
 8. Storage infra
 9. Food Processing infra → Value addition
 10. Availability of Credit to Marketing
 11. Promote Agri Market Research
- } Entire Supply chain for Value addition

E-Technology in Agriculture

→ Agri → 18% GDP, 58% pop'n

→ Various issues → Fragmented Land holdings

→ Low productivity

→ Faulty Agriculture practices

→ Agri Marketing Issues

→ over or under production

Hence Informed Farmer can produce in a well managed, trained, ecologically sustainable manner

→ **e-tech** is use of electronic devices, satellite, mobiles, apps to disseminate information using technology

→ **e-Agri** → Role of ICT in Agri to ↑ Prod, ↑ efficiency etc

→ **Uses**

↑ Improve Skills & Productivity of Farmers by Precision Agri & efficient use of agri

Facilitate linkage with Academia Govt, farmers
↑ R&D → more Innovation

→ Improved decision making by dissemination of relevant & timely info

- Seeds, Fertilizers, Pesticides
- Market Info → Prices, Intelligence
- Climate, Weather forecast
- Soil health, GWT,
- Schemes, New Benefits
- Agro Practices New

↳ - Precision Agri
→ New Devices → AI Based
→ Advisory Services

→ Drivers of e-Agri

→ Low Cost Mobile connectivity

→ Data Penetration → Internet cheaper

→ Govt & Policy support → Digital India + Neel-A

→ R&D + Startup ecosystem → Advances in Data, ICT

→ Awareness ↑

+ IT's etc

Language Barrier

Prono to cyber attacks

Delays Lack of 100% security

Small farmers left out

Challenges → Reluctance

No Awareness

Digital In frast → Regional Disparity

Digital Divide Illitrary

→ Govt Initiatives

1. NeGP-A → ICT in Agri to develop agri
→ Kisan call centres, Agri eUnic, Common Services,
→ SMS on weather
2. Nat Agri Policy → use of tech to promote agri prod
3. Kisan SMS Portal → Info, Advisories, address queries on inputs in local language
4. Kisan Sabha App → Direct Farmer-Buyer connect → eliminate Middleman
5. Crop Insurance App → (Digital India) calc Premium for crop Real Time
6. e-NAM, e-NWR (Finance credit) * → AGRISNET
7. Seednet → info on seed, (DACNET) Dep of Agri Coop
8. AGMARKNET → info on prices, availability, trends
9. KCC → queries → under NeGP-A

→ Private →

→ e choupal (ITC)
↳ Procure, info, marketing

→ Weather Based → NeGPA
↳ Gramin Krishi Mausam Seva

→ MAUSAM (Ministry of Earth Sciences)

→ Way Forward →

1. Increase access to Rural areas → ↑ Digital Connectivity
→ Infra Dev
→ use of Satellite
2. Local language use to provide info → address literacy
3. Integrate conventional comm like Radio
4. Digital education through community awareness
5. More policy support → Promote ICT across value chain → Farmer
→ Buyer
→ FPI
+ Awareness generation
6. More R & D into potential uses
↳ Quic by IITs, ICAR etc

Intro's & Conc

- The use of tech has defined 21st century
- As world move towards 94.0, Quantum Comp, IoT India has huge opportunity to reap the advantage of e-Tech in agriculture.
- e-Tech in agri is the next big step & helps in truly realizing the goal of "Atmanirbhar Bharat".
Doubling farmers income

Direct & Indirect Farm Subsidies & MSP

→ Subsidy → it is a financial support paid to provide input / income support & act as incentive to promote agri productivity. / inv. in agriculture

→ Types

1. Explicit → like DBT, Cash Transfer, or Subsidy on HYV seeds giving agri kits
2. Implicit → Not visible but hidden → by price regulation of inputs → Eg + Electricity, fertilizers, (NPK), Urea Subsidy
3. Output →
4. Food Subsidy

→ Mode of Payment → Band

→ Direct → Eg PM KISAN, DBT, Cash Transfer

Advantages

- Provide farmer with ↑ purchase power & More investment in agri
- Proper Identification of Beneficiaries (JAM) → Targeted Approach
- ↑ efficiency of Schemes
- Gives more choice to farmer on crop, type of farming or selection of quality inputs
- Behaviour change → Now farmer won't use reckless use of Power, Urea etc excess fertilizers

Reduces → reckless use of Power, Urea etc

→ Inflation

Disadvantages → Impact food security
→ No R&D in agri

- Cash misused → Purpose defeated
- May not produce intended results like ↑ Production of crop / in general also
- DBT currently leakages Fake Beneficiaries
- No Banking facility a hindrance

Indirect

cheap Credit Loans; Power Fertilizers

Adv

- Farmer Training also
- Can be specific to? Policy Tool Needs / Targets of govt
- Can be used to address development / R&D concern of Priority / Crop Diversification / Food security
- Ideal for large group (greater goal)

Disadv

- Skewed cereals
- Farmer don't realise the need to save water, judicious use of Power
- Leakages → NPK, SoB black market
- Misuse by beneficiaries
- Heavy fiscal Burden
- Cannot be target population Band.

→ Issues Related to Subsidies & Solutions

Fiscal Skewed to Cereals
 Fake beneficiaries
 Misuse → Black
 Env concerns
 Political agenda → Welfare Priority
 Loan waivers
 Indiscriminate Urea B.S
 Wastage of Resources
Inequalities ↑
 WTO concern

1. High fiscal Burden
Rs crore
2. Excessive use of Resources like GW, Power,
3. Env Effect & Soil fertility
Recd NPK (4:2:1), used in (6:7:12:4:1)
Bioaccc, Biomag
4. No benefits to target group
5. Cereal Centric, Regional Based + Input Intensive
6. Better use of Credit / Interest Subsidies
7. Loan waivers → Political / electoral gains
8. Indiscriminate use of Price Subsidies

Will healthy credit culture

Better targeting of only needed ones using JAM

Provide power only few hours a day / Shift to DBT / use technology

NBS scheme + awareness + soil health cards +

Neem coated + Nano Urea (100%)

Use Aadhar Authentication Financial inclusion

crop diversification + Organic + ZBNF + Horticulture + Integrated Farming

Credit culture + No politically motivated waivers

DBT → e-Urasak Portal

→ MRP of Urea fixed by Govt (1st) (N46%)

Excise cost to produce 20,000 MRP by govt 5000Rs Govt pay 15000Rs

→ MRP of Non Urea by companies → Centre pay flat per tonne subsidy
 → DAP → 2nd (P46%)
 → MOP → (K46%)

NBS Scheme (Dept of Fertilizers, MoCF)

To promote use of P, K also

↳ NPKS + other secondary also except Urea *

→ Issues

- Fiscal Stress
- Black Market by Bulk Buyers (smuggled to Ban, Nepal)
- Urea Not included → cheaper → ↑ use than before
- Import → CAD ↑

PM - KISAN (Mo Agri & Farmers Welfare)

- PM KISAN APP
- ↳ 100% Centre C. Sector Scheme
 - ↳ Small & Medium Farmers (8.5cr) → 6000rs (2 months) 2Krs
 - ↳ extended to all landholding farmer
 - ↳ excluded many Taxpayers Inst Farmers, etc

PM. Bharatiya Jan Urvarak Pariyojana

One Nation - one Fertilizer (MoCAF)

- 1/3rd share company details of BH Urea, DAP, MOP, NPK all
- Rest 2/3 Bharat logo } Both Private & Public Corp

PM - PRANAM → (Dept of F&T)

- ↳ alternative Nutrients
- ↳ use of Bio + organic fertilizers
- ↳ Same fund to fertilizers

PM - KUSUM

- India & WTO Agriculture Subsidies
- Focus on Capital Investment →
- Sunset clause for subsidies with strict targets & goals

Benefits

- Income Stability
- Investment Support → small farmer
- Improve HDI due to ↑ Income
- Food Security of Nation by ensuring Production
- Can be a policy tool → Crop diversification
- ↓ Inequalities
- National goals → SDG → Eg KUSUM Solar clean zero Hunger

MSP → 22 crops + FRP Sugarcane
 ↳ Cereals 7
 ↳ Oilseeds 8 + Jute + Copra
 ↳ Pulses 5
 CACP
 ↓
 COEA

→ MSP is the minimum guaranteed price given by govt to provide the farmer with income security during bumper production or fall in demand.

→ Also to provide min profit to promote Investment in agri → ↑ Productivity

→ History → ① To Promote green Rev → ↑ Surplus → ↑ Bumper
 ② Food security + Economic access of food to all

→ Logic → Twin obj of
 ↳ Induce fresh Investment from profit
 ↳ Economic access of food
 ↓
 ↑ Produce
 ↑ Food Security

→ Benefits of MSP

Most imp is enables farmer to escape Low Income Trap by

① Inject Certainty & confidence among farmers by advanced information + help in informed choice by cost-benefit analysis → Decide on crop

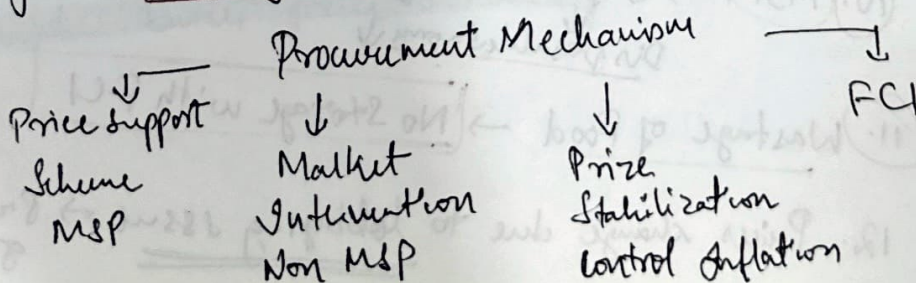
② Prevent Distress Sale → MSP
 ↳ Low Income → Low Invest → Low Produce → Low Income
 ↳ Poverty Trap
 ↳ Trap Vicious cycle

③ MSP support as anchor to Benchmark agri commodity market

④ MSP → ↑ Food Prod → Control Inflation
 ↳ ↓ Import → ↓ CAD → Fiscal Strength *
 ↳ Investment in other sectors

⑤ Inflation → ↑ Disposable Income → Spend on other sectors → Growth ↑

⑥ Helps guide Cropping patterns → as a policy tool for desired outcome
 ↳ Eg food & Nutri Security



→ Issues with MSP → More of Procurement for PDS than support

1. Unequal access & poor targeting → Procurement from few states & Big farmers → SMF left out
95% wheat from P, H,

Rural Areas & Backward areas left out

2. Procurement Issues

No regulation on NAFED / FCI on wheat to procure

So confined to big towns & cities + Big farmers + Cereal Centric procurement other crops on paper

⊗ → Decentralised procurement not much success

3. Deter Crop Diversification

only cereals high MSP → So import of other Oil seeds, pulses → CAD ↑

⊗ { Focus on Food security only + Hidden Hunger
* Not on Nutritional security }

4. Distortion of Free Market

Open ended procurement → Inflation → Farmers profit ↓ when supply excess

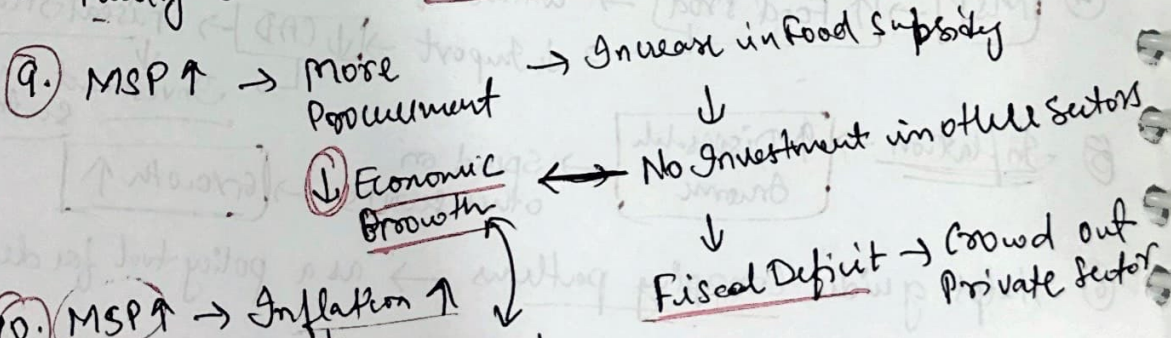
5. Other sectors loose out Investment

Capex formation poor

6. Flaw in PDS → other cereals like Jowar neglected → food of poor

7. Fiscal Squeeze → lesser inv on other sectors

8. Faulty criteria in MSP calc due to lack of accurate data



10. MSP ↑ → Inflation ↑ → Disposable Income ↓

11. Wastage of Food → No Storage with FCI

12. Prices change due to lobbying issue → Pressure groups

Issue with

High MSP

→ Politics of higher MSP

→ Lobbying by 'Bullock capitalists' → Pressure groups
+ coalition politics

→ Critical Evaluation of MSP :-

Although MSP has played a remarkable role in success of green revolution, food security from food shortage, making agriculture a profitable venture.

At the same time as noted by ES it is skewed towards big farmers thereby lead to ↑ income disparity among farmers spatially & size.

Also in favour of Cereals → No Nutritional security

+ Net exporter of water + Import of oil, pulses
lead to LAD ↑.

As noted by CAG → no norms followed in MSP leading to year on year variations → CAG stressed on greater transparency in method of fixing MSP.

→ More importantly as noted by NITI Aayog India@25

MSP is only a partial solution to remunerative returns. A long term sol'n lies in creation of

competitive stable, unified national market to

enable better price discovery

→ Reforms in MSP

NITI New India @75

1. Replace India's MSP by Minimum reserve price which could be starting point for auction in mandis
2. Replace CAP by Agri Tribunal → A-823B
3. ↑ Crop Diversification

Other

→ Shanta Kumar Comm

→ ③ let private sector procure

① * Govt to give priority to protein rich crops like pulses + oil → Higher MSP

② * Also FCI procure from smaller land holding

→ 2nd → Green Revolution here (States like UP, Bihar + CH)

③ Decentralised Procurement

To procure from remote farmers in villages not towns

+ Nutritional security priority

+ PDS → include pulses (1st CH did it)

④ Stop Bonus MSP

⑤ Computerisation of entire food management from procurement to storing to PDS + use of ICT

→ Other → MSP for Nutrition security → Coarse cereals, pulses, oilseeds

↳ steps to diversify agri acts like animal husbandry, Horticulture
Integrated farming

⑥ NWR should be scaled up → so that farmers sell to private & burden of cost of storing reduce to FCI

PDS → Object
Functioning
Limitations
Revolving

↓
M. C. A. R. F. P. D.

→ PDS is a social security program for the distribution of food grains & other essentials to the vulnerable sections through FPS at issue price or subsidised price

→ It was working since 1960's but rationalised as TPDS to poor (BPL) → NFSA, 2013

→ Rationale / Imp → is essential to fortify food &

① Nutritional security of nation by ensuring

② social & economic access to food grains.

③ → Right to Food is a FR → PUEL vs UOI

④ + address SDG 2 → Abolish Hunger.

Farmer
↓ Sell at MSP
Center (FCI)
↓ Central Issue price
State CIS
↓
Fair price at CIS of
Shops even
subsidised
price

→ Objectives :-

→ Provide consumer goods & food at affordable

→ Food & Nutritional security of Poor

→ Impact of Food Inflation

→ Maintain Buffer stock → In the event of fluctuation

→ MSP + Income security to farmers

→ Redistribution from surplus to deficit states

→ Issues related to PDS/TPDS :-

1. Diversion & Leakage → of food grains during Adulteration
transport or Black marketing by FPS owners

Sol → De-Privatisation of Ration Shops & Doorstep Delivery of grains to FPS by Chattisgarh govt addressed this issue

NSEO 2011-12
↓
46.7%
Diversion of
PDS grains

2. Identification of Beneficiaries - Huge inclusion & exclusion errors, NSSO - 63% poor excluded.

Along with this problem of fake ration cards & Ghost Beneficiaries

Targeting is diff → Universal PDS | Behavioural change like LPG giving

3. Food Subsidy Bill huge

Low Issue Price → Above Povertyline → Excluded APL → FCI → Grains Economic cost of holding ↑
↓
Food Subsidy ↑
Open ended procurement

4. Food Grains Poor Quality

↳ Due to Blackmarketing + Adulteration

Hence APL don't buy

5. ✓ Delays in arrival + Irregular supply + Storage → CAB found poor storage

6. Urban Bias, Storage issues, import Bill during shortage, etc + Damage due to poor handling → Pest, loss etc.

7. Structural issues in FCI + Centre state relationship

8. Environmental → Ground water depletion, excessive fertilizers
Issues due to excess procurement → Green Revolution

9. Open ended procurement + No "First In, First Out" followed
↳ Shortage in open market

* Shanta Kumar → Recd ✓ ✓ Important
Comm

10. No Nutritional Security

Cash Transfers
Induced to inflation

PDS Reforms / Revamping

JH

→ In the era of Digital India, "ICT" should be capitalised to plug the loopholes. CH & TN PDS models are worthy emulating Pan India

Aadhar linked Ration
 → ↑ Transaction cost for Beneficiaries
 → Leverages Not reduced but denied Ration to 10% genuine beneficiaries

① * CH has done

- * GPS tracking of vehicles PDS → Unattached Division
- * SMS Based monitoring → Enable citizen to monitor TPDS dispatch
- * Door step delivery → curb leakages
- * De Privatisation of Ration shops → run by SHG, Coops
- * Aadhar linked Ration cards → Double Benefits
- * e-POS + Aadhar authentication

Shanta Kumar Lomen
 → End-to-End Computerisation of PDS & FPS

② → DBT or Food coupons

③ → Digitization of Ration Cards

④ → Universal PDS / UB Income

→ All these reforms should be replicated in ALL STATES

} Alternatives

to realise the noble goal & purpose of PDS

& moreover a proactive role of PRI, SHG, NGO's

& effective "social Audit" → is needed to ensure

transparency.

→ DBT / DCash Transfer vs PDS

→ Shanta Kumar Lomen aadhar.

→ use PMJDY + Aadhar
 → zero → gradual DCT using JDY accounts
 → In Name of house

- * Adv of DCT
 - Food Subsidy Bill ↓ (Storage, Proc, Trans) cost ↓
 - Autonomy to beneficiaries
 - Financial Inclusion + Better targeting

- * Disadv of DCT
 - No protection from Price Volatility
 - Diversion to Non Food → Impact Main purpose
 - No Bank, ATM access

Universal PDS → Includes Migrants, worker
 → Inclusion errors
 → But cost of food subsidy ↓ / same
 → Persuade well off to give up Subsidy like LPG
 → UPDS^U lacks element of "Affirmative action"

Buffer Stock by CCEA

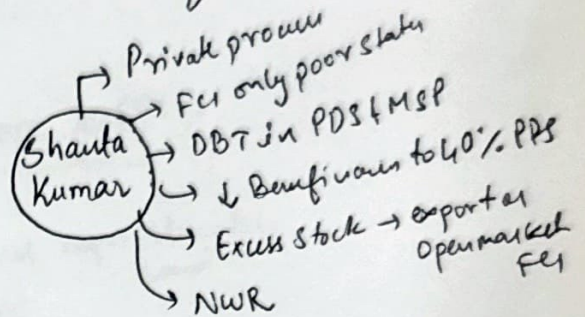
→ System / Scheme that maintains reserve of food grains

- for
 - Food Security
 - TPDS → source of food to all welfare schemes
 - Market Intervention → Price control → Release in open market
 - Disaster preparedness
 - Income security

→ Critical Evaluation

- ① Open ended Procurement → Storage, Handling costs ^{No capacity}
- ② Dual obj → Food sec + remunerative price
- ③ Inventory management & SEM challenges → Leakages
- ④ Inefficiencies in TPDS
- ⑤ High logistics cost
- ⑥ Wastage in Storage, transport

Food Security

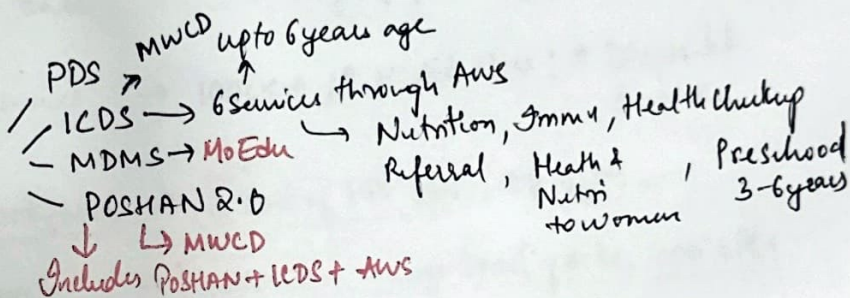


→ Defⁿ

→ Challenges

→ Benefits

→ Schemes



→ NFSA, 2013 → food → welfare to Right based

- 75% R to receive (TPDS) 50% U
- ① Features
- ② Individual entitlement 5kg of W, R, Coarse ^{3L 2Rs 1Rs}
 - ③ 35kg to family AAY
 - ④ Special focus on children, Women, Adolescent girls nutritional needs → + Pregnant woman → 6000Rs →

→ Food Fortification →

⑤ MDM, take home ration, → 14 years

⑥ Grievance redressal mech

→ PM. Garib Kalyan Anna Yojana provides extra 5kg on Normal 5kg

↳ Min of Finance

Just Park
Manufacture

FPI → Sunrise Industry

→ FP → is the transformation & qualitative upgradation of agri, horti, dairy, fisheries products through systematic process like grading, ~~sterilizing~~, packaging etc. & value addition

→ FPI is a crucial link b/w agriculture (Primary sector) & Industry (Secondary)

→ FPI gained significance post green revolution & peaked post 1990 & 2000's.

→ India's Potential / Strength factors / Scope for FPI :-

- ① Potential Raw Material Base → Due to varied / Diverse agro-climatic land + huge popⁿ on agri
- ② Wide Consumer Base → 100cr+ ; ↑ Middle class ; ↑ Disposable Income
- ③ Cheaper Workforce → ↓ cost of FPI ops ; ↑ Profits ✓
- ④ Govt Support → SAMPADA, Mega food parks, 100% FDI ✓
- ⑤ R&D support & Dev → Inst like National Dairy Research Inst, Central Food Tech
- ⑥ ↑ focus on Robust National Logistics Policy + SCM. + Multi-modal logistic parks etc
- ⑦ Export Competitiveness → Low cost, high quality + Globally connected markets
↓
Ready Markets for Indian products
Eg. +
- ⑧ Scope for Development → Large untapped potential

→ Status of FPI in India

* FPI is at nascent stage with just 2% of Fruits & Veg processed & 35% milk & 21% meat

* Aggregate FPI is 10% (China 40%, Brazil 70%)

* FPI → 5th largest industry
→ — % of GDP

→ Potential to contribute 9mn Jobs by 2024

→ Acc to Confederation of Indian Industry → FPI has potential to bring \$ 33bn

2nd → Fruits & Veg

1st → Milk

↓

But

National Milk Safety & Quality Survey - PSSAI

↓

37.7% milk adulterated

→ Significance :-

1. Double Farmer Income → Income protection } → Reduce Migration
2. Income diversified
3. Crop diversification ✓ → Horti + Dairy +
4. Address Nutritional Sec → MalNutrition → fortified foods
5. Reduce food wastage (↓) → Post harvest loss in India 90,000 Cr
6. Food Inflation Control → ↑ Shelf life → Demand = Supply
7. Export Potential → ↑ Quality + ↑ Shelf life
8. Jobs → employment → Nonfarm employment
9. Women empowerment → Agri, Horti, Ani → mostly women entrepreneur
10. FDI → investments → Boost growth

currently
≈ 10% of
India's exports

→ Supply chain of FPI :-

- FPI → Primary → refining agri → wheat to flour
- ↳ Secondary → Basic value add → process meat, coffee
- ↳ Tertiary → High value add → Jam, Sausages, RTM

→ Upstream ops → material flow into org / manufacturer

- Include → search for Rawmat
- ↳ Farmer link, Storage godown
 - ↳ Quality facilities

Backward linkages
Inbound logistics

→ Downstream → Flow from org to out

Forward / out bound linkages
logistics

- Include → cust, storage, exports
Retailer, testing

→ Significance

- Encourage farmer to grow quality produce
- Remunerative price
- ↓ Food wastage
- ↳ Food in market → Timely
- Export

Challenges

- Small Land holding
- Seasonal Raw Material
- Intermediaries, broker
- Logistics poor, Transport
- Storage poor, electricity
- Unorganised sector ↑

Marketing
No cold chain infra
Inadequate S, T, Warehouse
→ Low export potential
Poor Testing Net

Fragmented Land holding
↑
Supply Side
→ Fertilizer Pesticides excess
→ Seasonality of Raw
↓
Loss Backward linkages
Low Crop Div

Infra Bottlenecks

Challenges

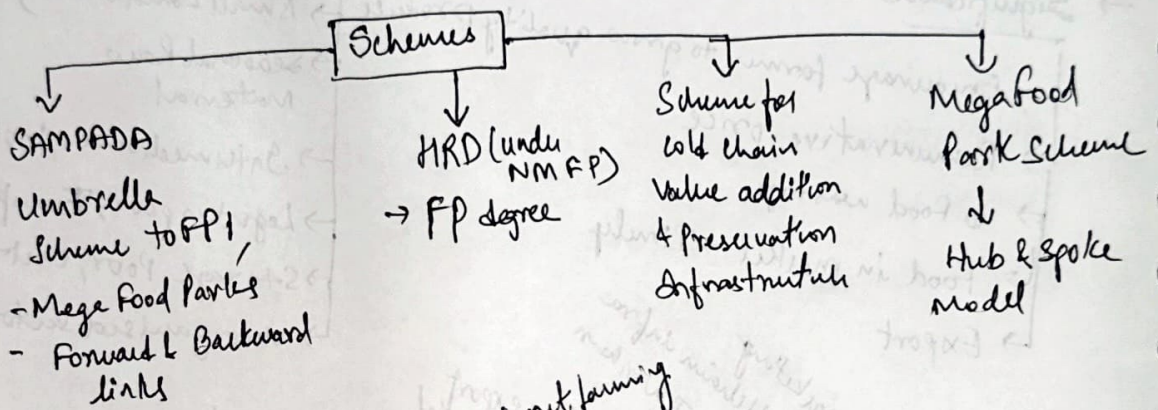
75% Unorg Sector
↑
Regulatory Deficiency
↓
Multiple Legislation
↓
Pending Reforms

Poor Technology
↓
Low Value addition

Poor Economics of Scale
↑
No Training
→ Poor Credit access
↳ 90% FPI are small
So No Tech Investment, R4D & Brand building

Govt Initiatives in FPI :-

1. National Mission on Food Processing → Address Brst & Infra issues
New Tech, ↓ wastage
2. Financial → FPI in PSLNbrms
↓ 100% FDI → FPI under NABARD
3. One of 25 focus areas under "Make in India"
4. NIFTEM, CIPHET, IIFPT, ICAR → Specialised Insts
5. Ensure → PSSAI → monitor & issue std's
Quality
6. TRIFOOD
7. One Nation One District - one Product



→ Way Forward

1. Agricultural Reforms → Crop div, Mixed farming, Organic, HYV
2. Infrastructure → Storage, Cold, Logistics
3. National Logistics Policy
4. Promote Contract farming → Boost Backward linkages + Corporate farming
5. Technology upgradation in FPI + high value addition
6. Streamline regulation → APMC Act, Single window clearance,
7. Implement Draft National Food Processing Policy
8. Enable Credit access
9. Behaviour / Mindset change in stakeholders involved

Animal Rearing

- Associate Business w/ Agri
- Cont → 4% GDP & 25% Agri GDP & 8% Employment
- Critical component in Mixed, Integrated farming
- Biogas - Gobardhan
- Foxes → 2nd in Beef exports; Wool, leather huge potential

→ Benefits to farmers

1. Alternative source of Income - Mowing Bank
2. Food & Nutrition source to farmer family
3. Social security to landless farmers
4. Draft power → Animals
5. Source of fertilizers - Bio-fertilizers; Bio-gas
6. Resilient to climate change

→ Component of Inclusive growth

1. Combats Malnutrition and hunger
2. Provides self employment
3. Women Empowerment
4. More Equitable than Land
5. Reduce Poverty → economic empowerment

Conc → In a country where 50% population is dependent on A/
there is need to diversify risk, promote livestock which
ensures Income, Nutritional security & promotes exports also

→ Challenges

1. Frequent outbreak of diseases Eg + Lumpy skin, Foot & Mouth
2. Yield & Productivity issues → 50% of global average
3. Methane emissions → Livestock contribute 14.5% of GHG
4. Lack of technological advancements → Limited Artificial Insemination
5. Funding issue → only 12% of agri exp channelised to AR
6. Poor insurance coverage + Poor Veterinary health care
7. Market access → underdeveloped / connectivity
8. Informal sector → unregistered slaughterhouse → Poor Price realisation
9. Lack of quality checking or standardization of animal products

→ Measures / Way forward

1. Feed & Fodder Security → high yield fodder seeds, wastelands for fodder
2. Bank Credit & Insurance
3. Boost Cold chain infra → as perishable nature of dairy, meat
4. Increase public spending
5. Veterinary services to be strengthened & vaccination
6. R & D
7. Follow Codex Alimentarius Standards
8. NITI India @ 75 → Promote genetically superior breeds
↳ Capacity Building for Farmers & fish breeders using Technology
↳ Establish village level procurement for better SEM

→ Govt steps

1. Dairy Processing & Infra fund to enable Milk processing capacity
2. Animal Husbandry Infra development fund
 - ↳ capital availability to farmers
 - ↳ Private Investment
3. National Animal Disease Control programme
NADCP ↳ Eliminate Foot & Mouth by 2030
4. KISAN RAIL & UDAN → connectivity
5. MNREGA to develop fodder farms
6. Artificial Insemination → ↑ to 70% from current 30%.
7. E-Pashu Haat to connect breeders & farmers → Quality Bovine Germplasm
8. Rashtriya Gokul Mission → sustain extreme climate
↳ conserve Indigenous Cattle
9. Dairy Extension Services ✓
10. GOBARDHAN ✓
 - ↳ Obj {
 - ↳ Modernise sector using technology
 - ↳ Inclusive growth
 - ↳ Generate employment
 - ↳ ↑ Food production
 - ↳ way forward

→ Challenges

1. Poor quality fish seed
 2. obsolete technology
 3. Depleting Inland water
 4. Unsustainable practices
Eg Blast fishing
 5. Lack of Extension staff
& limited knowledge of farmers
 6. Poor Post harvest infra - ^{No} cold chain
 7. Absence of standardisation & branding of fish
 8. ~~Out~~ dated fishing vessels
1. Promote FPO in fish sector
 2. Develop post harvest infra
 3. Promote sustainable fishing
 4. Integrated farming eg Rice in Kerala
 5. Modern ways
'Biofloc'
 6. Upgrade fishing vessels
& Mapping of fishing zones using GAGAN