# Unlocking the Potential of Indian Agriculture for Inclusive and Sustainable Growth

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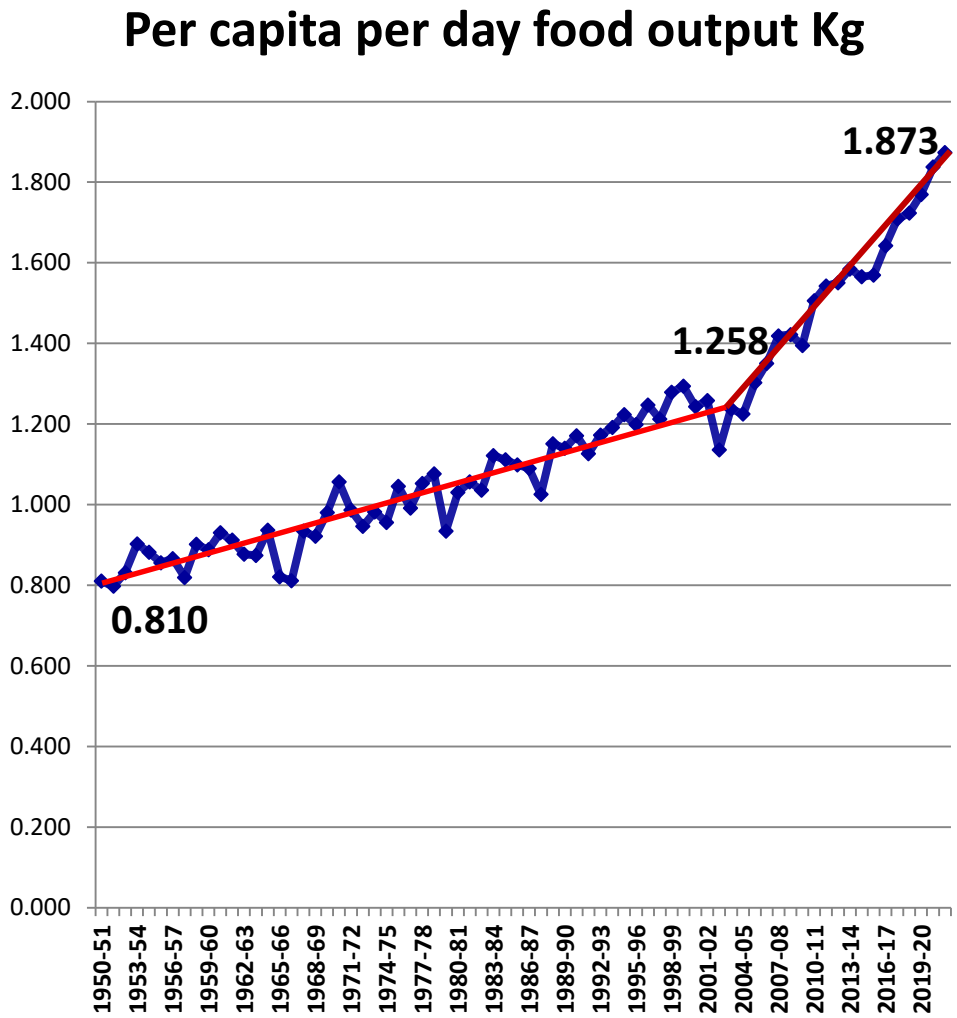
# Per Capita Food Production Pointing towards Rise in Surplus




**No change 1951 to 1967**

**Setting up of SAUs like PJTAU started changing the situation**

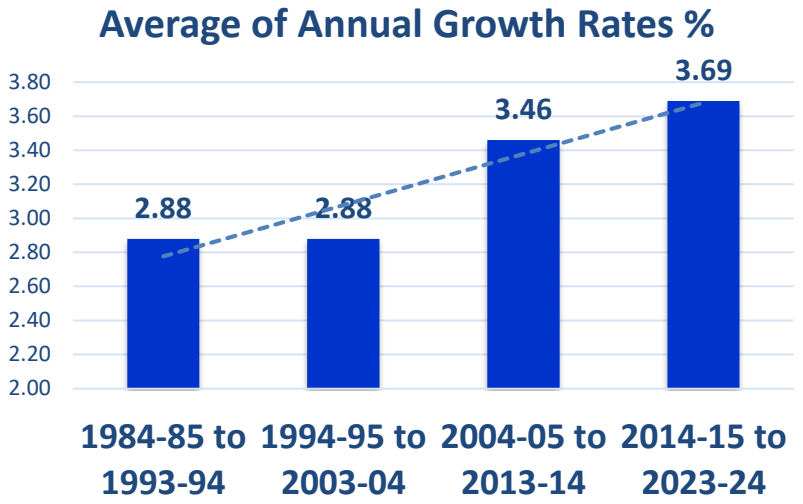
**50% increase in 40 years following green revolution**

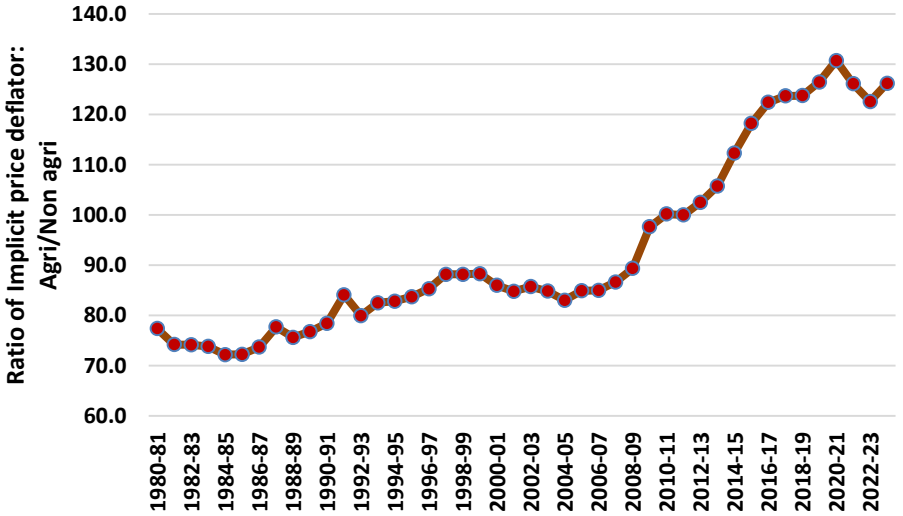
**Next 50% increase in less than 25 years.**

**Led to surplus and export and net export**

# Acceleration Towards Record Growth
# Great Achievement with Great Challenges

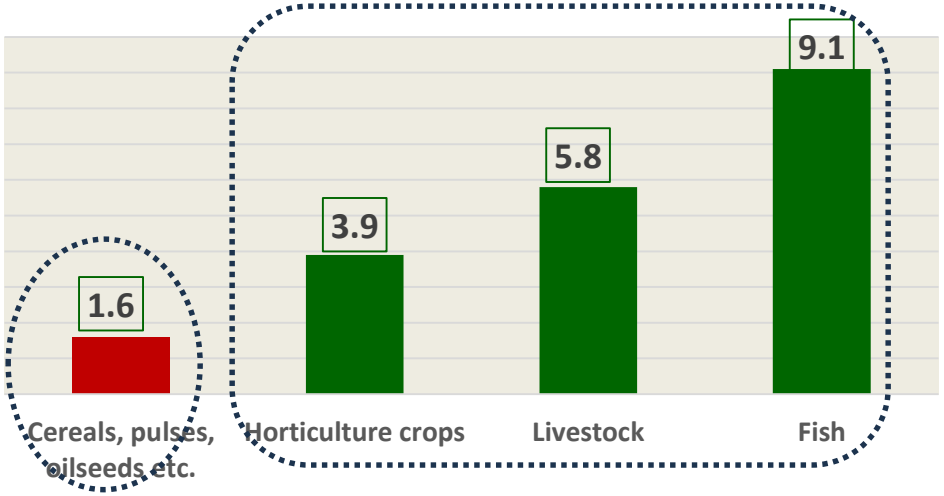
- **Gr accelerated and historically highest.**
- **Challenges**
- **Driven largely by prices, irrigation and diversification. Technology role diminished**
- **Real prices of agri-food witnessed unprecedented growth – inflation. Attract import, adverse for export**
- ***Resource intensive – sustainability***
- ***Large disparities: in terms of products and regions***



# Dualism Emerged in Agriculture

- Clear division: Vibrant and Sluggish Segment.
- Av Annual Gr Rate 2014-15- 2022-23




- Food composition turned healthier
- Horti became main driver of growth in crop sector in most states
- But not everywhere and not for every farmer
- Low growth segment very big as field crops (MSP crops) grown on 94% area and horti on 6%
- 47% farmers neither do horti nor livestock. Need special attention – matter of concern

# Field Crops Growth Very Uneven

| Field Crops: Av of annual Gr rate 2014-15 to 2022-23 at 2011-12 Prices | | | |
|---|---|---|---|
| State | Better Performing | State | Low Performing |
| Telangana | 6.92 | Assam | 1.49 |
| Chhattisgarh | 5.39 | Gujarat | 1.44 |
| Madhya Pradesh | 4.92 | Rajasthan | 1.24 |
| Tamil Nadu | 3.43 | West Bengal | 0.70 |
| Odisha | 2.91 | Jharkhand | 0.69 |
| Uttar Pradesh | 2.77 | Andhra Pradesh | 0.47 |
| Maharashtra | 2.67 | Himachal Pradesh | -0.12 |
| Bihar | 2.64 | Punjab | -0.16 |
| Karnataka | 2.42 | Haryana | -0.40 |
| | | Kerala | -0.59 |
| All India | 1.64 | Uttarakhand | -1.10 |

# Why Slow Growth in Field Crops in Most States CAGR in Yield TE 2013-14 and TE 2022-23

| Crop | Compound Annual Growth rate % |
|---|---|
| Rice | 1.57 |
| Wheat | 1.34 |
| Maize | 2.75 |
| Total Cereals | 1.87 |
| Tur | 1.98 |
| Gram | 2.62 |
| All Pulses | 1.80 |
| Total Foodgrains | 1.56 |
| Groundnut | 3.90 |
| Soyabean | -2.30 |
| R/mustard | 2.52 |
| Total Oilseeds | 1.09 |
| Cotton | -1.35 |

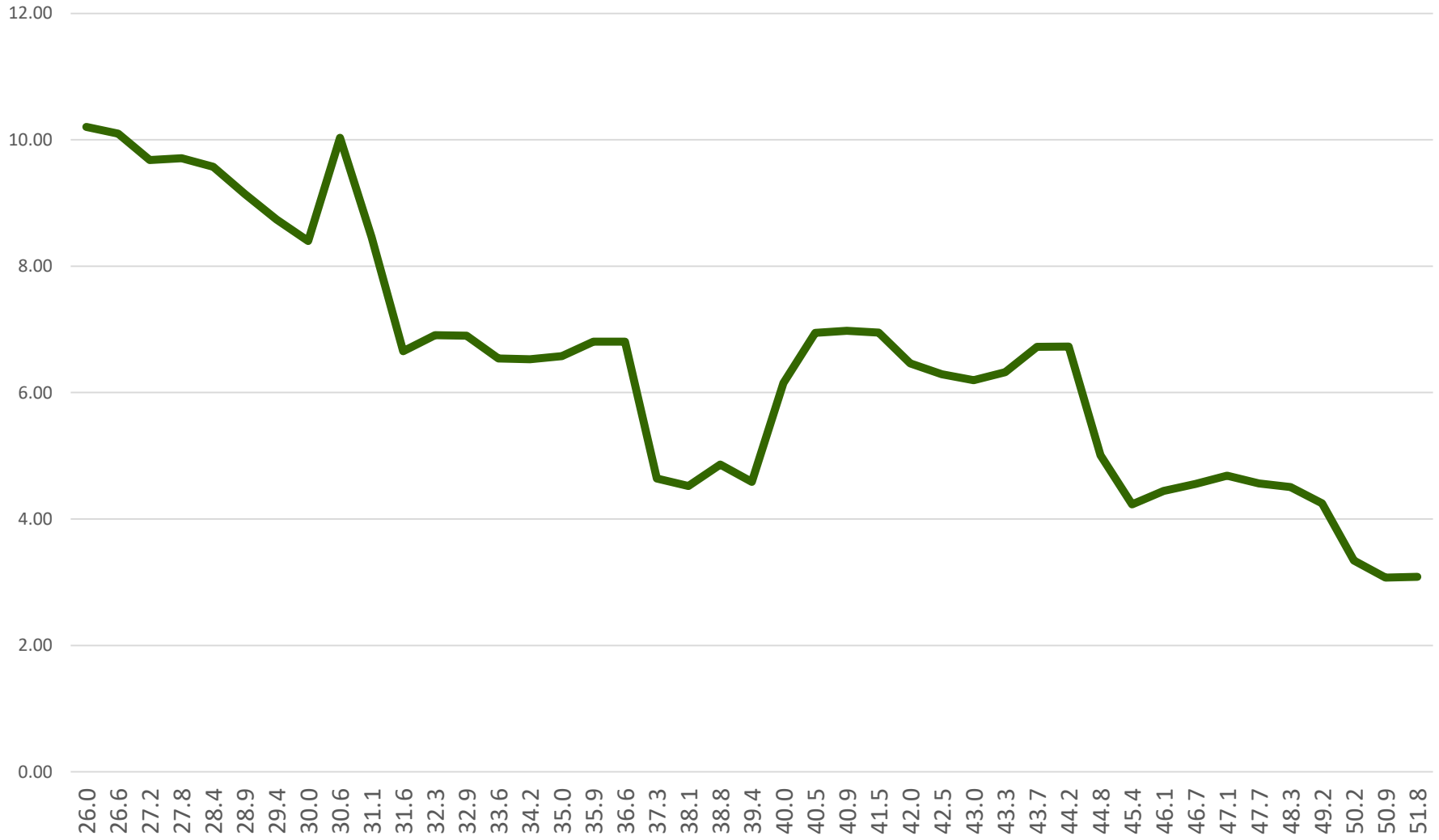
Prof. Ramesh Chand

# Crucial Role of Irrigation in Indian Agriculture

1. **Source of short, medium and long term growth**
   - a) **Higher yield**
     - **Pure irrigation effect. Fertiliser, high yielding varieties**
   - b) **Change in crop pattern towards high value crops**

     **(a and b raise productivity/ha by 2.5 times)**
   - a) **Crop Intensity**
   - b) **Better output quality**
2. **Stability and resilience**
3. **Adaptation to climate change- set off adverse effect**
4. **Adaptation to change in opportunity**
5. **Realised in the beginning of era of plan development**
6. **More than 80% public investments in agriculture spent on major, medium and minor irrigation projects**

# Progress in irrigation and year on year instability in crop output
## Moving average of Decade: 1971-80 to 2022-23



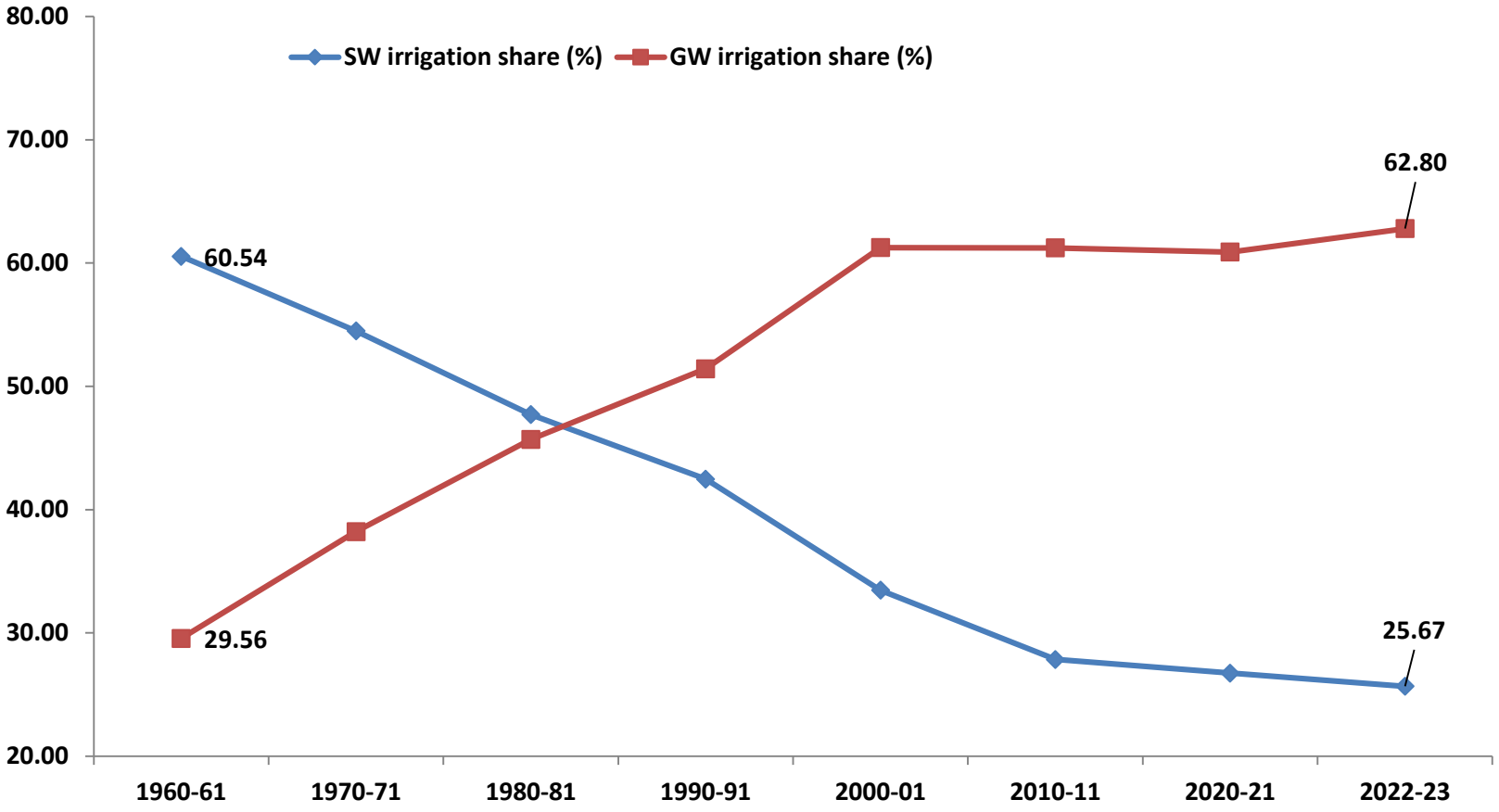
# Agriculture and Sustainability

- **Very high share in natural endowments and use of resources**
  - **Share of arable land in total land: 58.8% (World 11%)**
    - **Little area left for ecological functions. Onus on agri**
  - **Agri Share in fresh water use**
  - **Green house gases emissions**
- **Out of 17 SDG, 3 heavily and 7 partly depends upon nature and performance of agriculture**
- **Rising threats to sustainability**
  - **Groundwater overexploitation on the rise**
  - **Land degradation on rise**
  - **Unsustainable practices rising (How address Tech. policy. Regional Crop planning)**
  - **Imbalance in input use**
- **Biodiversity/Ecosystem**
- **Inter generational equity. Sacrificing long term for short**

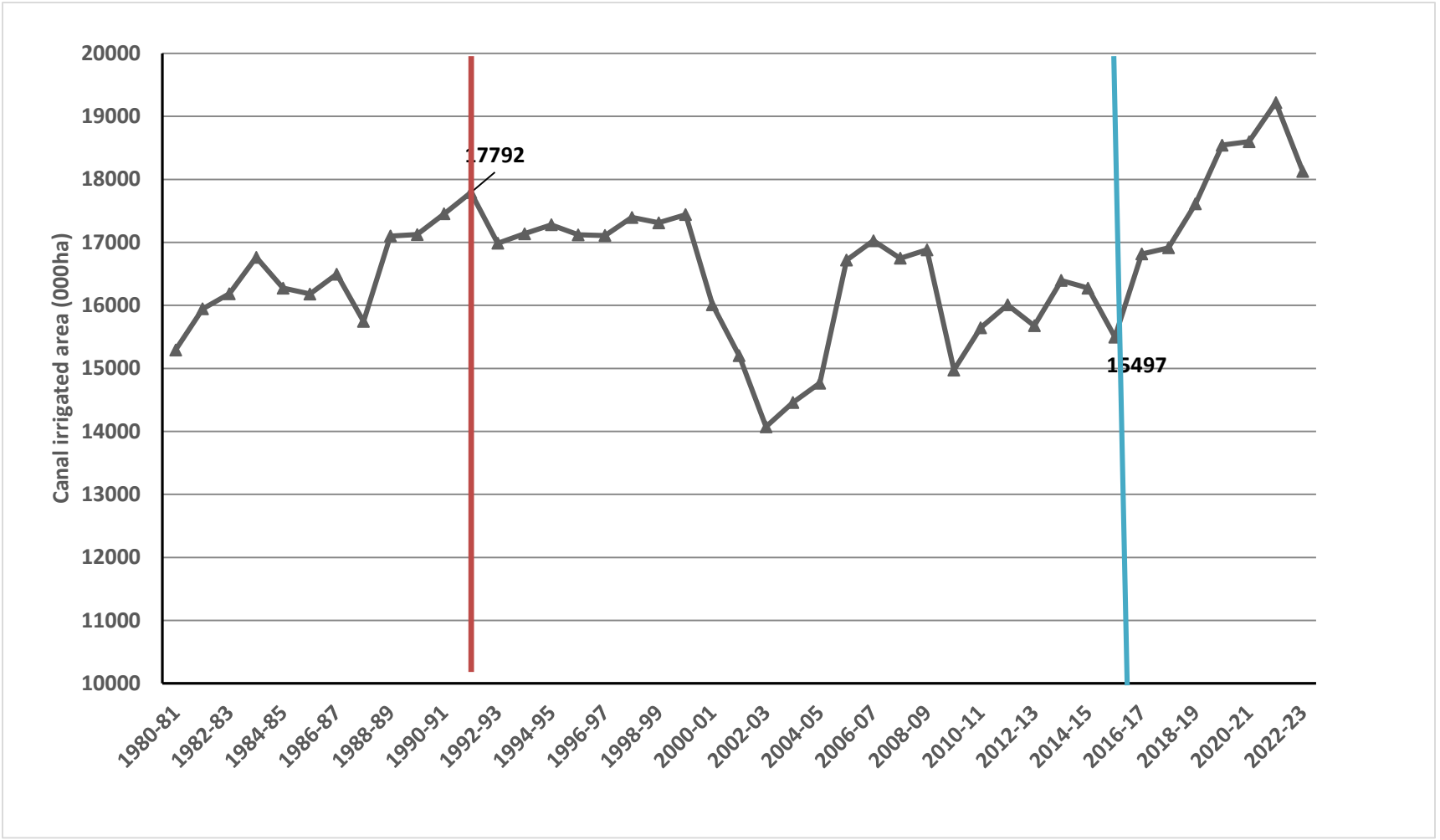
# Issues in Irrigation Sector

- **Excessive reliance on groundwater. Reversal of shares of Sw and Gw**
- **Leading to groundwater mining everywhere**
  - **Exacerbated by free power or highly subsidized tariff on power for extraction of water**
- **Reduced flow of water – catchment areas**
- **Highly inefficient and indiscriminate use of water**
- **Very slow modernization of irrigation**
- **Distortions in crop patterns, crop choices, crop practices and seasons**
- **Trade in virtual water**
- **Inter state conflict over water sharing**
- **Long stagnation in Sw irrigation after mid 1980s**

# From Dominance of Sw to Gw



# Long Stagnation in Canal Irrigation Despite Heavy Investments

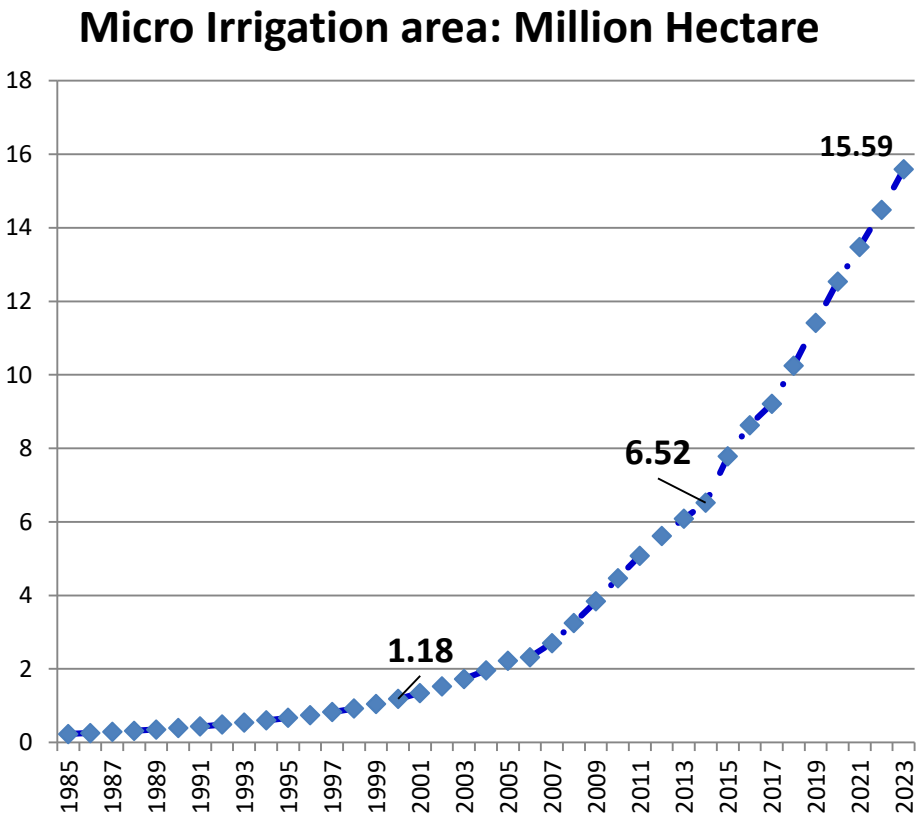


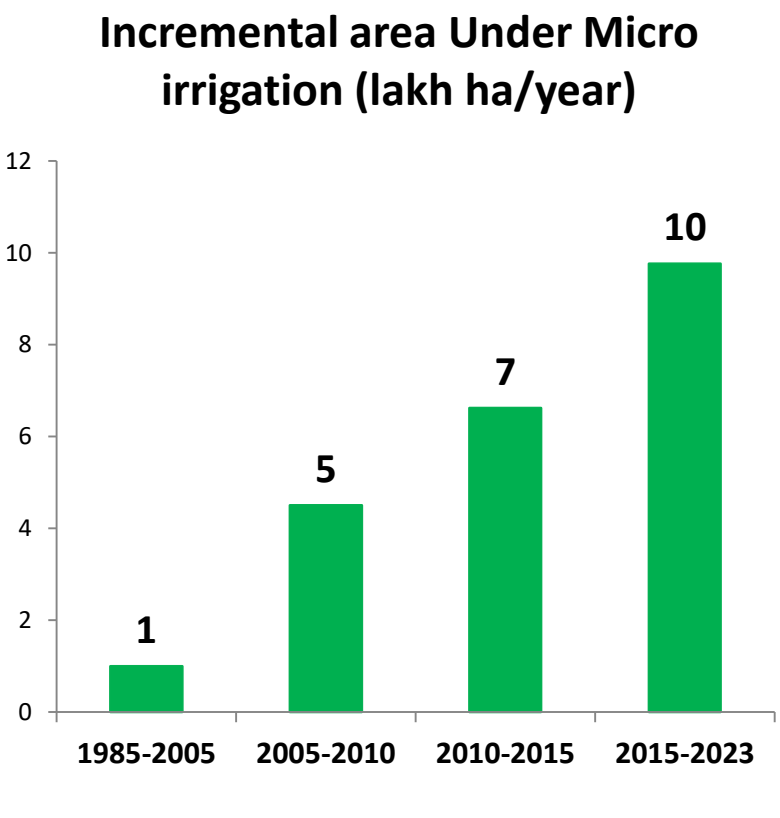
# Efficiency of Water Use

- India uses more than 2 times water used in China, per unit of agri-food
- Much higher than world average
- Why? Flood method of irrigation
- Implications for harnessing irrigation potential

| Average Virtual Water Content of Selected products in select countries | | | | |
|---|---|---|---|---|
| Water use/ ton: Cubic metre | India | Brazil | China | World |
| Wheat | 1654 | 1616 | 690 | 1334 |
| Rice | 4113 | 4447 | 1906 | 3419 |
| Cotton | 18694 | 6281 | 3210 | 8242 |
| Maize | 1937 | 1180 | 801 | 909 |

# Progress in Micro Irrigation




- **Area under micro irrigation gaining pace but still low**
- **Share in GCA: 7.6%. Share in GIA: 13.7%**
- **Highly skewed: 2/3 rd in MH, KK, Guj, AP, Raj**

# Harnessing Potential

- **Ultimate irrigation potential with flood irrigation**
- **Harping on efficiency**
- **Sw: Must redesign and revise strategy from time to time to maximise impact and close gap between IPC and IPU (eg PMKSY).**
- **Time bound replacement of flood irrigation with alternative practices**
- **Continuation of incentives for micro irrigation**
- **Replacement of free power subsidy with DBT and user charges as per metered supply of power**
- **Promoting Agro Climatic Regional Planning**

# Harnessing Sustainability

- Major determinant: Technology and policy
- Both should focus on sustainability
- Realized threat to people and planet
- Attempt at shifting emphasis
- Sustainability missions and other initiatives
  - 10 missions
  - Alternative farming methods and systems
  - Waste to wealth and circular economy
  - RCTs gaining slow popularity
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# Raising Productivity and Output of Field Crops

- Identify and focus on distt and crops with zero or negative gr
- Technology. Upgrade R&D: Public, private and MNCs
  - Fix larger issues in ICAR, SAU
- Liberalize and expedite lateral flow of superior germplasm
- Facilitate private sector in seed sector. Remove Measures for stringent input quality control
- Raise seed replacement rate
- Push crop intensity and irrigation in states below 35% mark
- Solar and micro irrigation in Eastern states
- Improve market infrastructure and make price play in East India

# B. Help Non Adopters to Diversify

- **Shift focus of CSS like MIDH to spread horti among 47% non adopters.**
- **Div is must for growth in high productivity esp in states like Pb and Haryana**
- **Use schemes of animal husbandry and dairying to take them to new agri households**
- **Horti and livestock- demand driven growth. Engage with states to liberalize market and attract private investments.**
- **Value chain development, logistics, processing**
- **Consider extending PMFBY type insurance to suitable horticulture crops.**

# Issues Specific to Telangana and PJTAU

- Major source of growth in crop sector is rice
- Rank first in growth in field crops but rank 4$^{th}$ in growth of crop sector among major states
- Area share of rice increased from 29% (2013-14) to 51.6% (2022-23) as irrigated area increased from 31 lakh ha to 64 lakh ha.
- Area share of Fruits and veg fell: 4.8% to 2.8%
- Must start diversifying towards Fruits and veg
- Opportunities in quality
- Teaching side:
  - Curriculum-Skill based education. Extn officer to farm manager and entrepreneurs.
  - Fit for private sector job

# Thank you!