

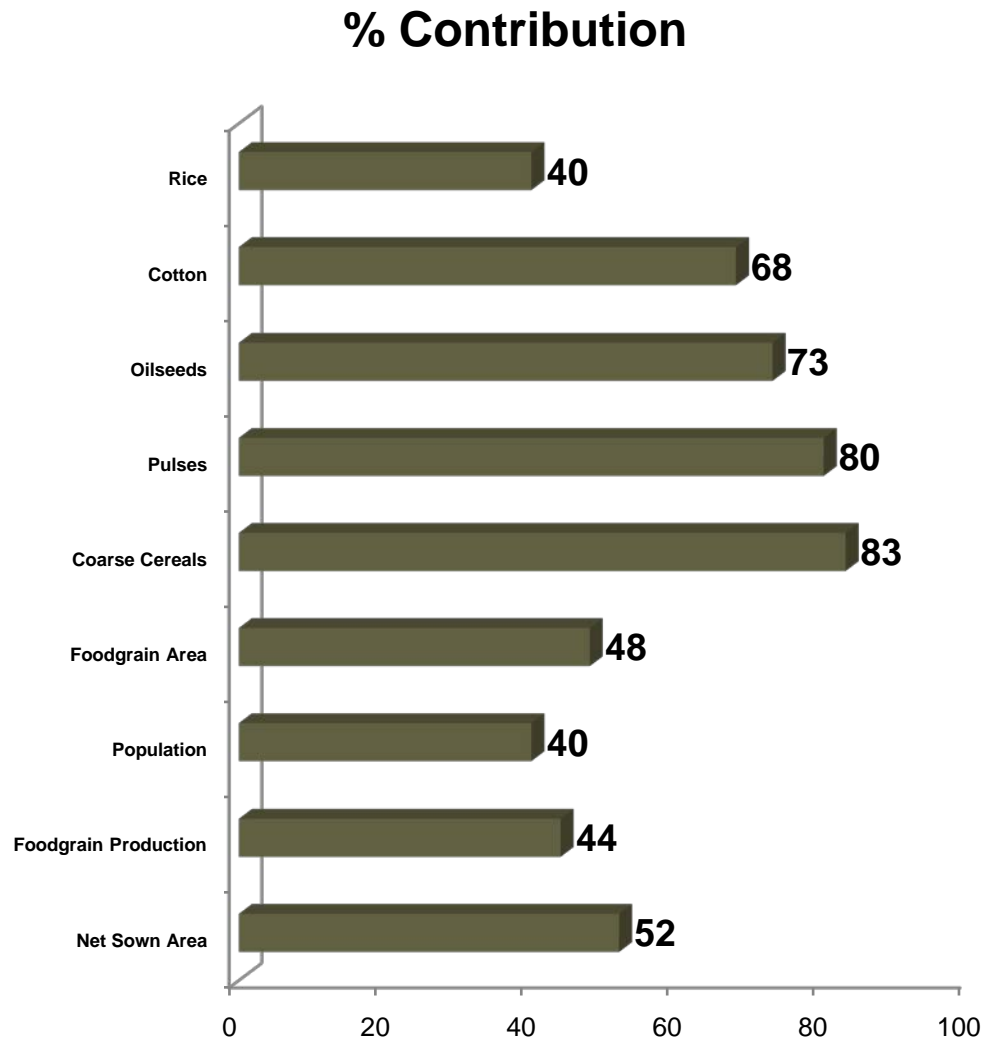
Revitalising Rainfed Agriculture in India



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Water Stressed Cropping/Livestock

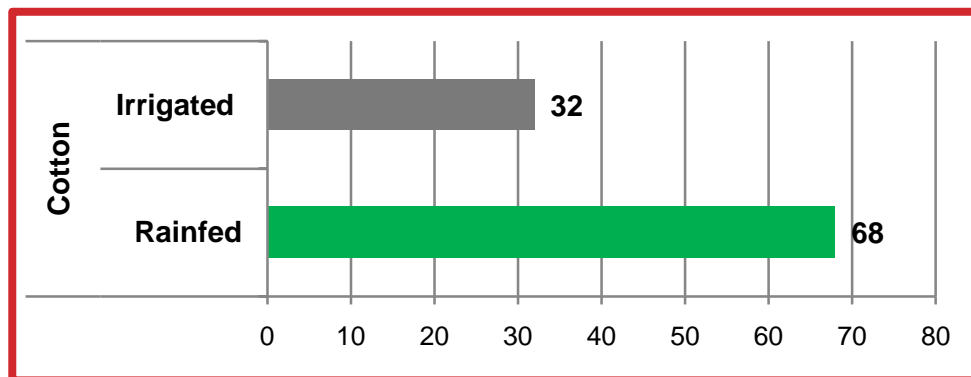
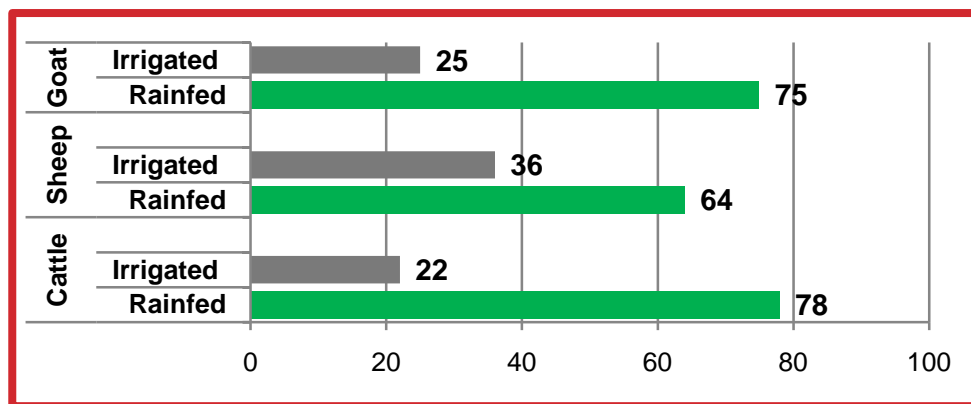
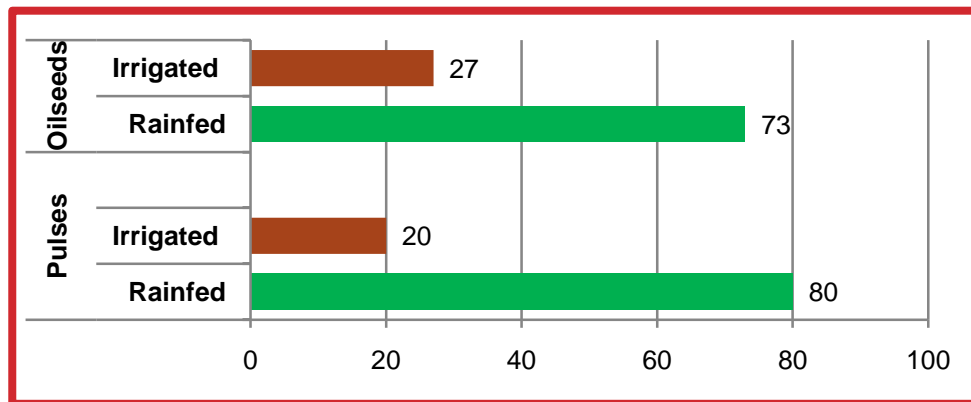
- Shortage of water for 7.5 to 10 months
- Wide spread N and P deficiencies along with micronutrients
- Excessive runoff further deteriorates soil nutrient status
- Mean annual temperature $>18^{\circ}\text{C}$, rainfall exceeding evapo-transpiration 2 to 4.5 months in a year
- *Alfisols* and *Aridisols* - abundant soil orders



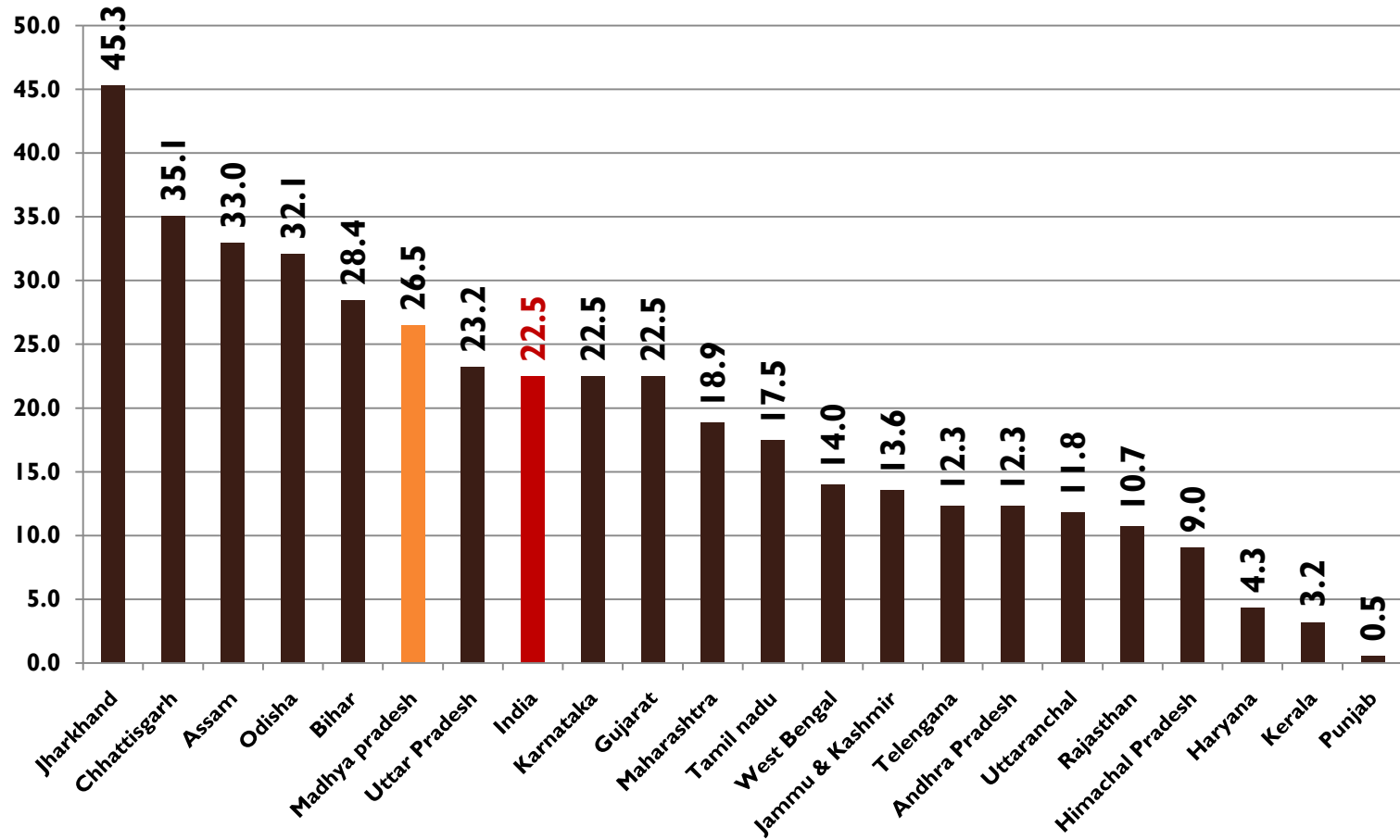
Water stressed areas provide maximum Protein & Fat

•Major domain for protein and fat supplements in Indian diet

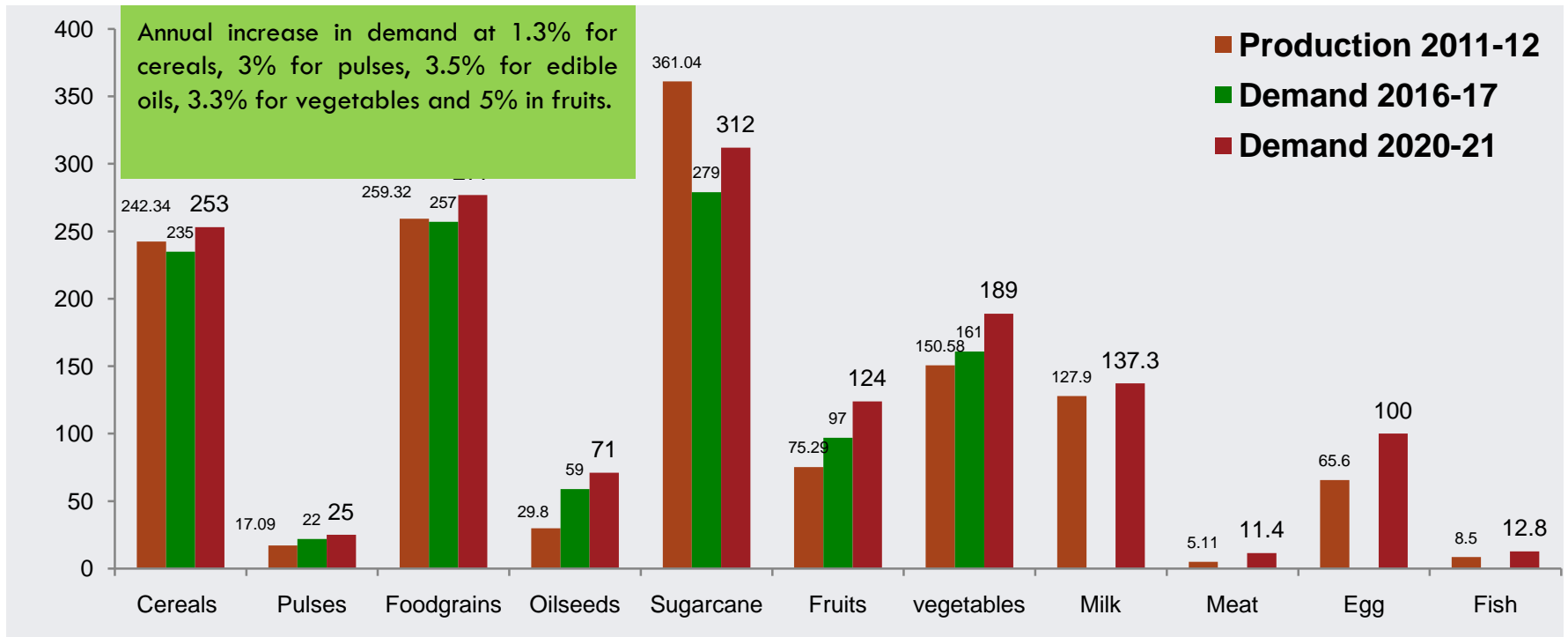
- Leads in the production of pulses, oilseeds, coarse cereals, and livestock
- Predominant cotton producer-strong linkage with textile industry and employment



Poverty among Farm Households



DEMAND - SUPPLY DYNAMICS



NEED A PARADIGM SHIFT

- **Move from Commodity centric to an area-focussed approach**
 - Investment in rainfed agriculture at ~Rs. 50,000/ha
- **Knowledge-based Agriculture**
 - Improved inputs, Diversification and R&D
- **Farmers Centric Agriculture**
 - FPOs, Agri marketing & warehouse receipts
 - Credit, finance and insurance, capacity building
- **Industry-agriculture –farmer linkages**
 - Market infrastructure, export opportunities, agribusiness
- **Government a facilitator**
 - Mission mode approach to enhance land and labour productivity
- **Governance**
 - Convergence matrix of programmatic interventions

**MOVE FROM COMMODITY
CENTRIC TO AN AREA-
FOCUSSED APPROACH**

Water and Irrigation: Issues

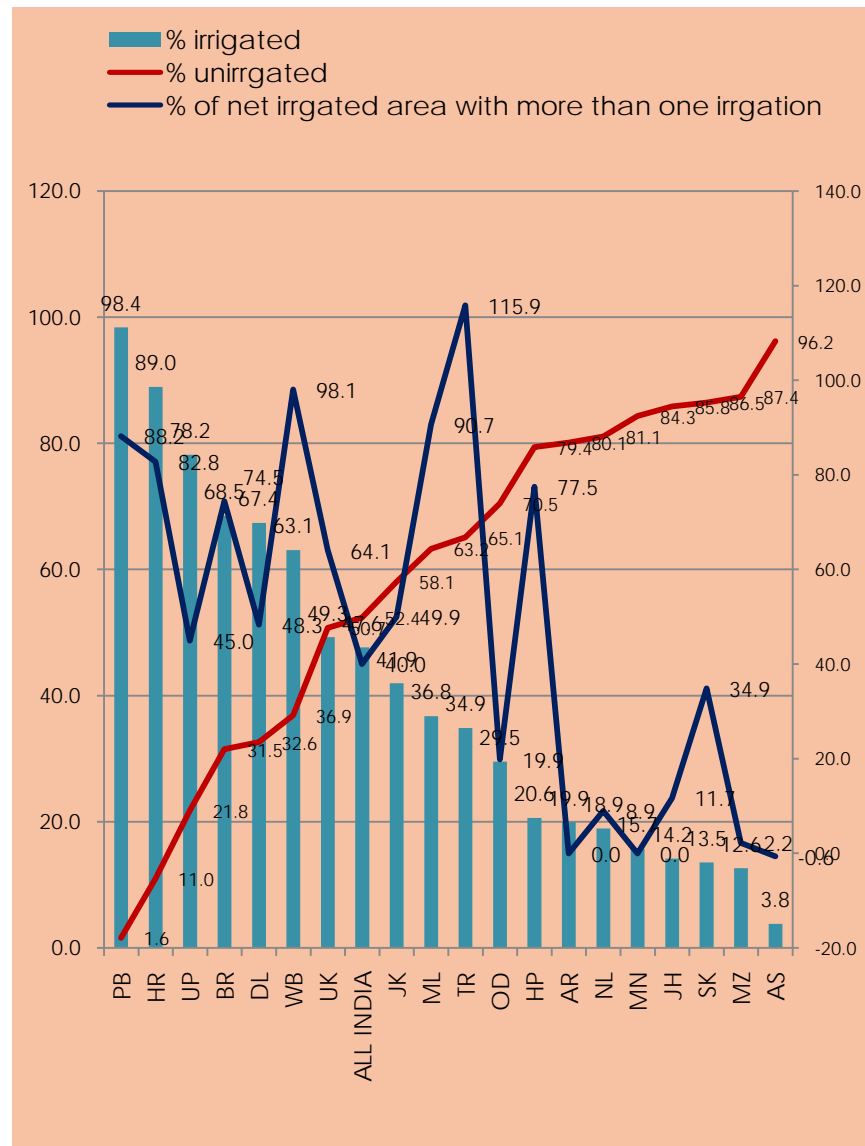
India is water stressed. 52% of cropped area remains without irrigation and some regions are chronically water stressed yet:

- Currently, irrigation consumes 84% of the water (industry 12% and households 4%)
- Water use in irrigation in India is 2 to 4 times that in USA and China per unit of major crops

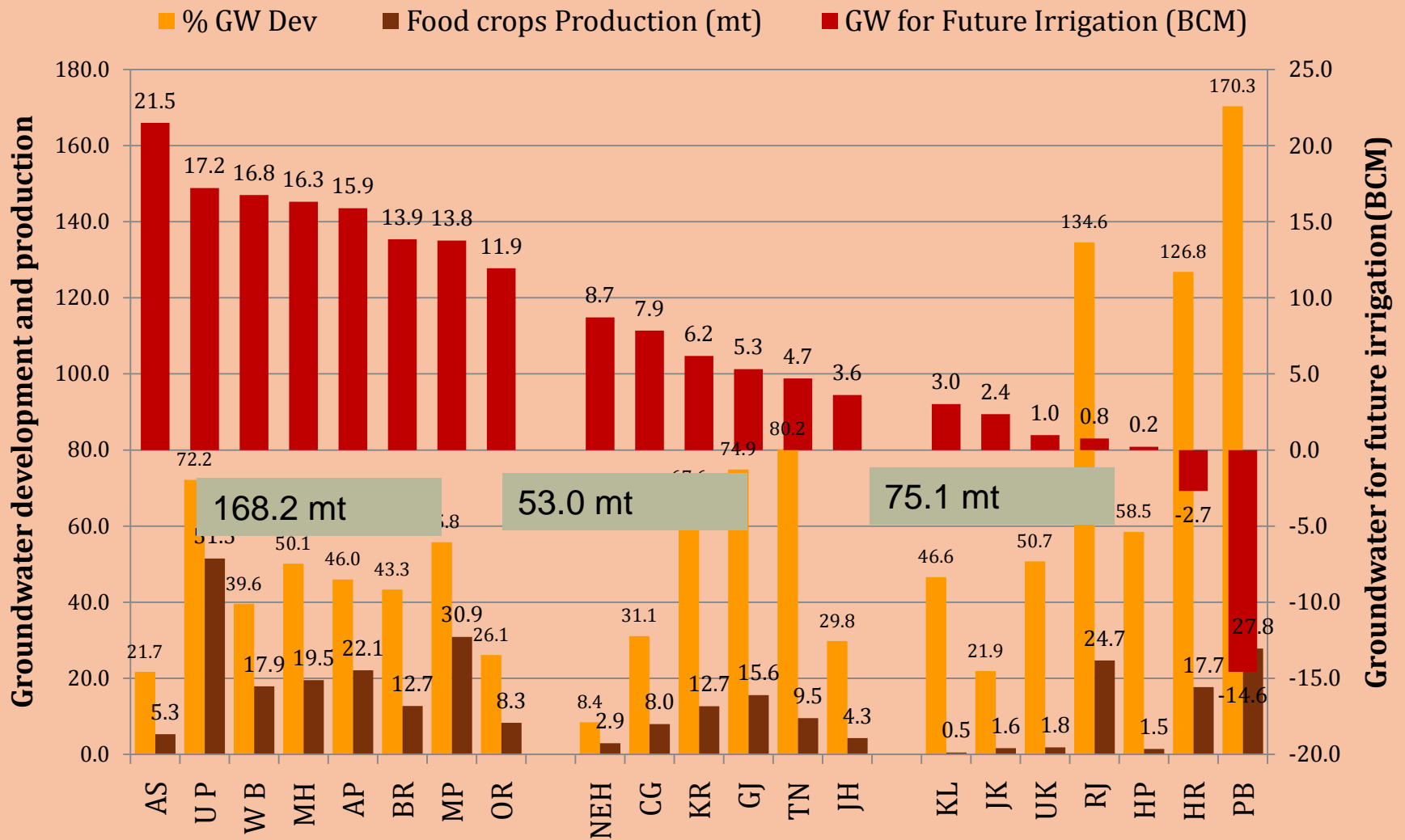
Share of canal in net irrigated area declined from 39.8 % to 23.6 %.

Groundwater sources increase from 28.7 % to a whopping 62.4 % between 1950-51 and 2012-13.

- In northwest, groundwater is over exploited
- In the eastern states, substantial scope for harnessing groundwater remains



Future Irrigation Opportunities



**KNOWLEDGE-BASED
AGRICULTURE
IMPROVED
INPUTS, DIVERSIFICATION
AND R&D**

Water Management: Opportunities

- **Shift to Efficient Water Application Tools (EWATs) for conserving the water and raising productivity**
- **Water positive techniques- System of Rice Intensification and Direct Seeded to conserve water and raise productivity**
- **Divert investments on irrigation technologies and infrastructure from subsidies to irrigation and electricity: offer farmer groups a choice between the two**
- **Utilize MGNREGA for last mile connectivity and minor irrigation projects/irrigation tanks**
- **Complete the nearly complete major irrigation projects under PMKSY**
- **Utilize the irrigation potential already created- Prioritise CADA investments**
- **Specialised solution for chronically water stressed areas**

Seeds, Fertilizer & Pesticides

Accelerate SRR to reach 33% in HYVs and 100% in hybrids.

- **Revitalize seed chain with focus on replacing varieties older than ten years by new ones.**
- **Incentivise public sector and facilitate private sector to raise quality seed production to generate adequate supply.**

Promote skill in seed production at village level

Facilitate private investment in R&D of seed and its promotion

Fertilizers- Opportunities

NPK use is skewed towards. Realign norms for fertilizer use according to products such as urea, neem-coated urea, sulphur-coated urea and urea briquette.

Inform farmer through soil health card on optimal use of fertilizer by soil type, crop and water usage.

Encourage the farmers to better calibrate the balance as well as level across different fertilizers

Farm Mechanization

Farm Mechanization: Issues

- Small land holdings, high capital and low credit worthiness of farmers
- Inadequate rural infrastructural services
- Availability of durable, light weight and low cost farm implements

Farm Mechanization: Opportunities

- Scale up the custom-hiring centre and replicate the best practices of the States;
- Reorient public extension agencies from varieties and inputs to farm mechanization, RCTs and post harvest activities

New Technologies: GM

The technology promises

- Higher productivity
- Lower use of fertilizers, weedicides and pesticides
 - Tolerance against drought, salinity and other abiotic stresses.
 - Fortification of grains and edible oils with vitamin A and modified fatty acids

World's leading scientific bodies like the US National Academy of Sciences, the UK's Royal Society, the German Risk Assessment Agency, the European Academy of Science, the Canadian Royal Society, the New Zealand Royal Society, and India's seven science academies have all declared that GM crops are safe

New Technologies: GM

As a part of its strategy to bring a Second Green Revolution, GM crops needs to be promoted with appropriate safeguards

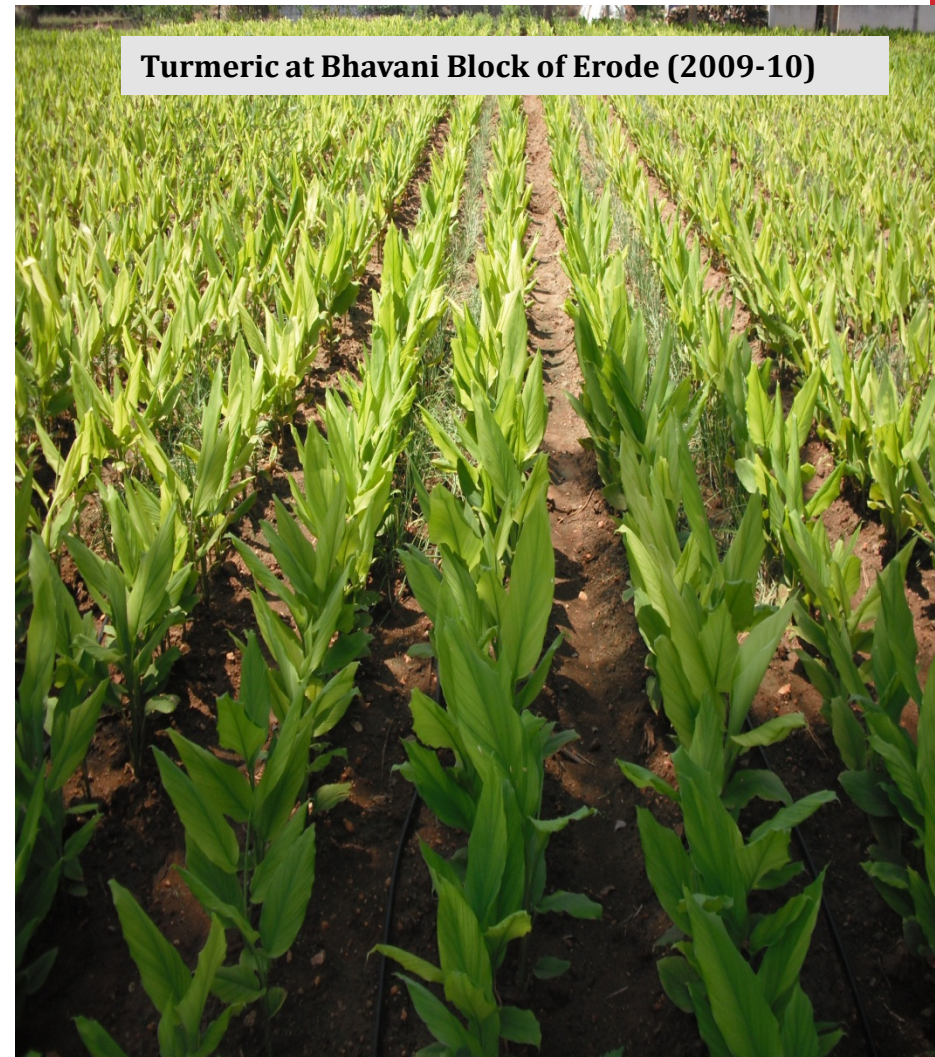
- Recognizing the general sensitivity to permitting multinationals, proceed with domestically sourced GM seeds only.
- According to the evidence presented by the leading Indian Research Organizations, a large number of India sourced candidates for field trials and eventual commercialization already exist. These may provide a good starting point.

NEW TECHNOLOGIES: PRECISION FARMING

Options Include

- Precision farming
- System of Rice Intensification
- Nano-technology
- Hi-tech Horticulture and Animal Husbandry

Introduce and encourage judiciously, taking into account the cost-benefit factors. The criterion in most cases should be commercial viability without subsidies



Shift to High Value Commodities

Issues

- With rising incomes, demand side factors are highly favourable for diversification towards high value horticultural, dairy, fisheries, poultry and livestock.
- But infrastructure, institutions and public policy are not very favourable towards the transition in most states.

Recommendations

- Strengthen through public support the livestock disease surveillance, control and health infrastructure
- Expand cold storage facilities
- Provide market finance to farmers
- Facilitate the development of food processing industry, which will create demand at lucrative prices for high value commodities.



Hi-Tech Polyhouse



Use of Energy

- Energy inputs to Agri. now 1.84 kw per ha, this needs to be raised to 2.2 kw per ha by 2020.
- Priority given to harnessing non-conventional and renewable resources of energy.

Livestock and Fisheries

- Induction of high yielding breeds, improvements in animal healthcare, feed, fodder, drinking water, shelter, institutions, promotion of irrigated fodder etc.
- Small reservoirs, tanks, water harvesting ponds created under MGNREGA have potential for fisheries development.

Agri.-Research & Extension

- SAUs, KVK could be the centres of knowledge development, management and transmission to users.

- **Essential to bring about better synergy between SAUs and ICAR.**

FARMERS CENTRIC AGRICULTURE

Farmer Producer Organisations

- **FPOs are emerging as useful mechanisms**

- aggregation of inputs/outputs and optimal deployment of resources
- access to mainstream capital for improvements in production system assets
- risk reduction through financial measures, cropping choices; and
- creates opportunity to scale the quality demanding urban consumer and agro-processing industry.

- **RBI will have to include financing to FPOs in its priority sector**

Remunerative Prices

MSP: Issues

- MSP procurement limited to a few crops and regions
- Persistent demands for higher MSP and ever-rising procurement, which is infeasible in view of fiscal constraints
- Subsidized sales of cereals under PDS in regions where there is no procurement divert part of the demand from local farmers, lowering the price the latter receive

MSP: Opportunities

- Extending MSP and procurement to more crops and regions is infeasible both fiscally and administratively
- Limit MSP-based procurement to building buffer stock and stock for price stabilization
- For all else, we can level the playing field across regions and crops by replacing MSP by deficiency payments amounting to 10 percent of the market price, which is fiscally feasible and WTO compliant
- This may be initially tried on a pilot basis in cotton in select districts

Farmer Distress and Relief

Issue

- A mechanism is required to bring quick relief to farmers impacted directly or indirectly by natural disasters.

Opportunities

- Conduct the relief transparently as an emergency social program. Create a database that identifies farmers and corresponding Aadhar seeded bank accounts. In case of a natural disaster, transparently identified by weather data and a set of weather related criteria, transfer a minimum specified sum of cash immediately into these accounts.
- Appropriate avenues to create jobs for those farmers interested in exiting farming. Farm-oriented processing and small-scale industries offer two such avenues.
- Implement PMFBY to deal with distress situations. Evolve a mechanism for the provision of a diversified set of crop insurance products by a diverse set of insurer firms.

INDUSTRY-AGRICULTUR E FARMER LINKAGES

Industry-Agriculture-Farmer Linkages

Industry enhance investment

- imparting knowledge with the use of latest information technologies
- knowledge institutions which are engaged in agriculture research
- facilitate developing appropriate new technologies combining farmers wisdom and traditional knowledge
- Developing Infrastructure Projects related to secondary agriculture –processing and value addition

GOVERNMENT AS FACILITATOR

Utilize the Underutilized

- **Mission-mode programme for Rainfed Areas**
- **Convergence of schemes/programmes.**
- **Eastern states and other rain-fed regions suffer from low productivity and disproportionately greater incidence of droughts, floods and cyclones that can destroy standing crops.**
- With procurement concentrated in regions with well-developed irrigation and PDS bringing subsidized grain to eastern states, farmers also face depressed prices in the local markets.
- abiotic stress -drought, flood, submergence and salinity
- 11.7 m ha rice fallows that can be used through crop Intensification (short duration pulses and oilseeds in winters)
- Tribal dominated areas of Odisha, Jharkhand and Chhattisgarh -Organic by default -offer good scope for organic farming.
- Considerable scope for groundwater development in the region though with the important qualification that high arsenic levels may disqualify certain areas

ENHANCING PUBLIC & PRIVATE INVESTMENTS

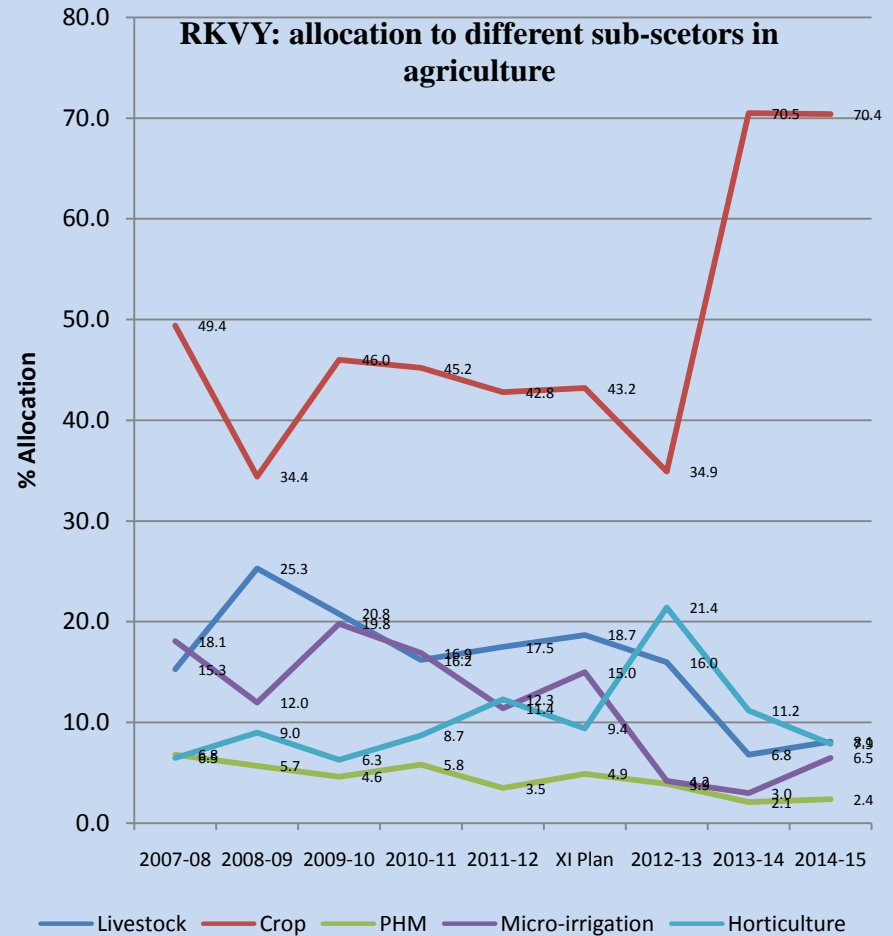
(CONVERGENCES OF RESOURCES)

- **Convergence within agriculture**
 - NFSM, RKVY, PMKSY (micro-irrigation), NMOOP, NMAET
- **Convergence between MoRD, Agri, MoFPI, WR**
 - MGNREGA, PMKSY, RKVY, CAD-WM
- **Overarching structure for Programme Administration**
 - Matrix for convergence
 - activities, responsibilities, scale and outcome

Rationalizing Allocation

Critical For Capital Formation

- Crop centric investment under RKVY
- Post harvest management got the least
 - Critical for future growth and Make in India initiative
- Many important sub-sectors allocated less
 - capacity of project preparation and absorption
 - Can it be linked with contribution to State Agri-GDP?

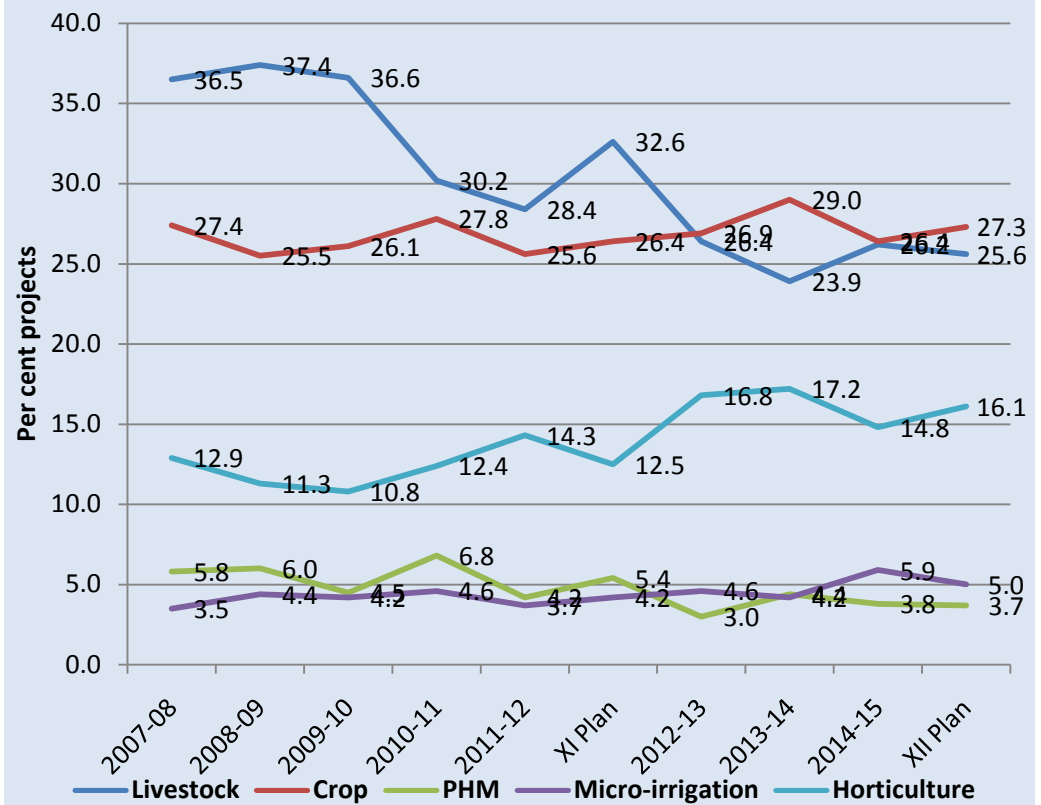


Distribution of Resources

- More than 20% projects to Livestock sector
- Very thin distribution of resources in many projects

- Impact on scale and outcome
- Effect on outreach

RKVY: projects sanctioned in various subsectors

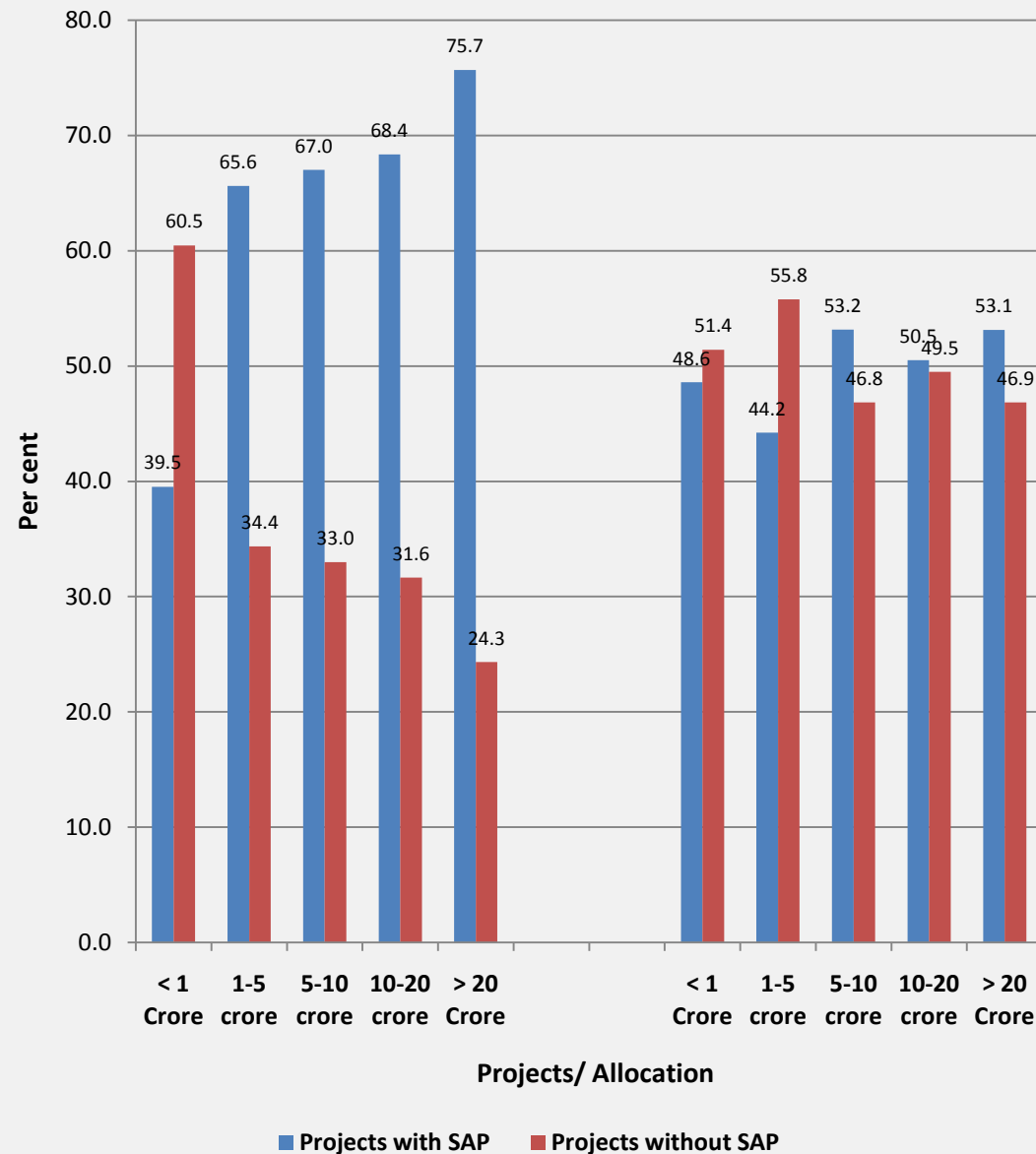


Critical Analytical Pathways- A MISSING LINK

•Production Growth

(Based on the information-
Chhattisgarh, Goa, Jharkhand,
Karnataka, MP, Odisha and
Puducherry)

- Over 51% projects in < Rs 1 crore category emanated without SAP
- More than 75% projects in >20 crore emanated from SAP
- Non-SAP/DAP projects prevailed over SAP-DAP projects in terms of allocation

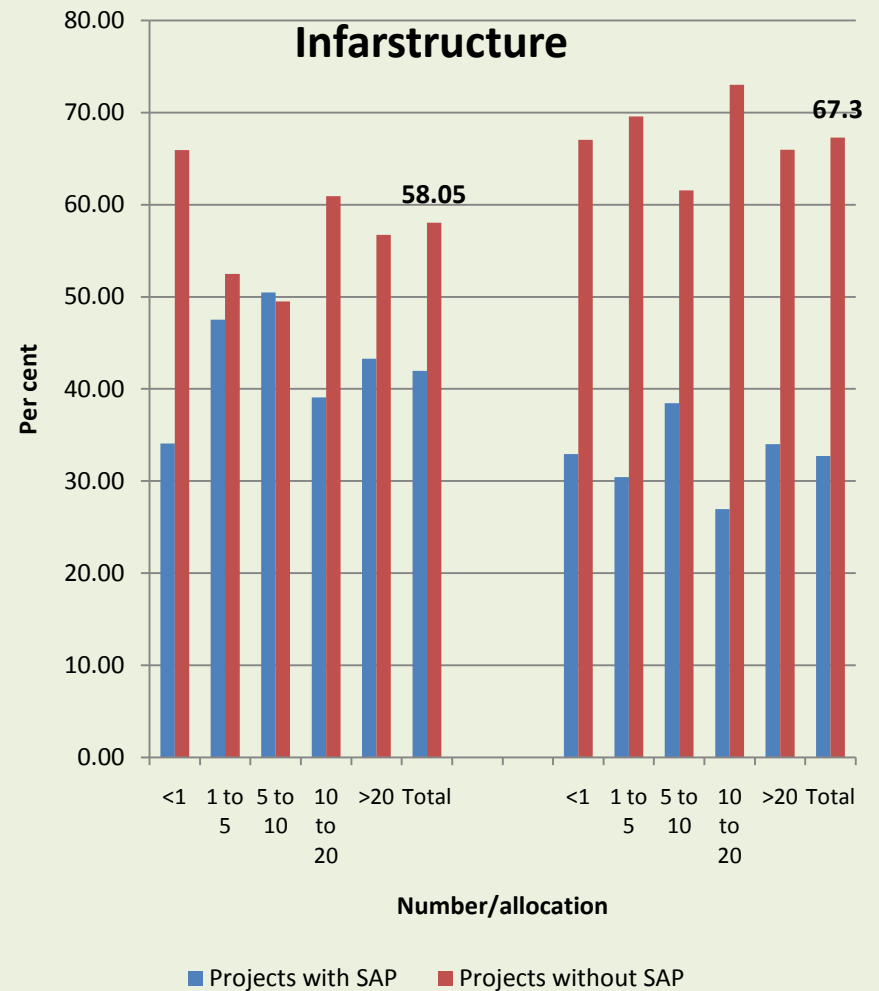


Critical Analytical Pathways- A MISSING LINK

•Infrastructure

(Based on the information- Chhattisgarh, Goa, Jharkhand, Karnataka, MP, Odisha and Puducherry)

- Over 65% projects in < Rs 1 crore category emanated without SAP
- More than 56% projects and 65% allocation in >20 crore category emanated from non-SAP route
- Non-SAP/DAP projects prevailed over SAP-DAP projects in terms of allocation
- Need to reversed for optimum utilization of capital formation



NEED A STRONG DATA BASE FOR RAINFED AGRICULTURE

Generate separate data for rainfed farming- over 50% of our geographies unreported

- rainfed farming and farmers
- irrigation systems
- seed scenario
- infrastructure

Separate estimates for

- rainfed crops production and productivity
- Livestock and their products



Thanks.....

