



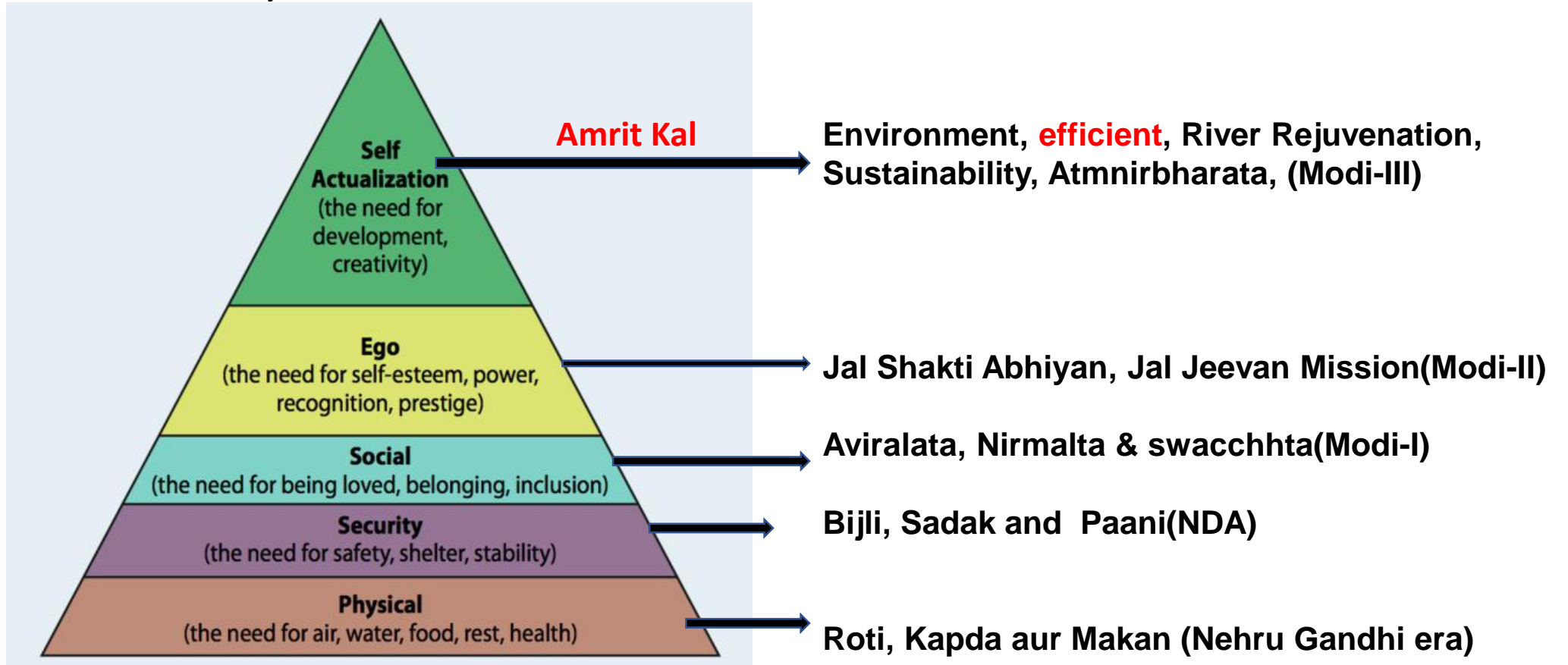
NATURE BASED WATER SOLUTIONS: SHAPING OUR WATER FUTURE

by

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Growth of perceptions on water in India

Maslow's Hierarchy of Needs



Environment, **efficient**, River Rejuvenation, Sustainability, Atmnirbharata for **Amrit Kal** of Independent India

- **Calls for Nature Based Solutions** involving the planned and deliberate use of ecosystem services to improve water quantity and quality and to increase resilience to climate change. They are typically adopted in conjunction with conventional water infrastructure to bring about more sustainable outcomes.

2018 World Water Day theme ‘Nature for Water’

Nature performs many functions of direct relevance to water managers, for example:

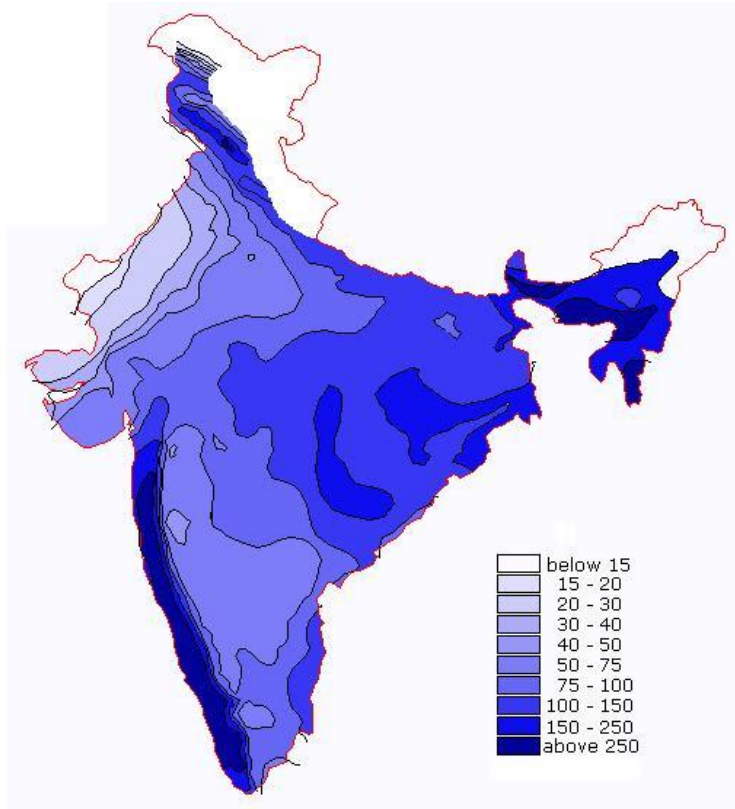
- Vegetation cover reduces damage caused by heavy rain by slowing run-off, thus reducing soil erosion and the related pollution, mitigating the impact of flash floods, and replenishing groundwater;
- Wetlands hold water back; their rich plant diversity takes up excess nutrients and filters out suspended solids; and
- Flood plains accept large volumes of water during extreme events, delaying or buffering impacts downstream.

Nature-based solutions for sustainable development are not new – there are many examples around the world – but **mainstreaming**, **accelerating** and **scaling up** progress is needed

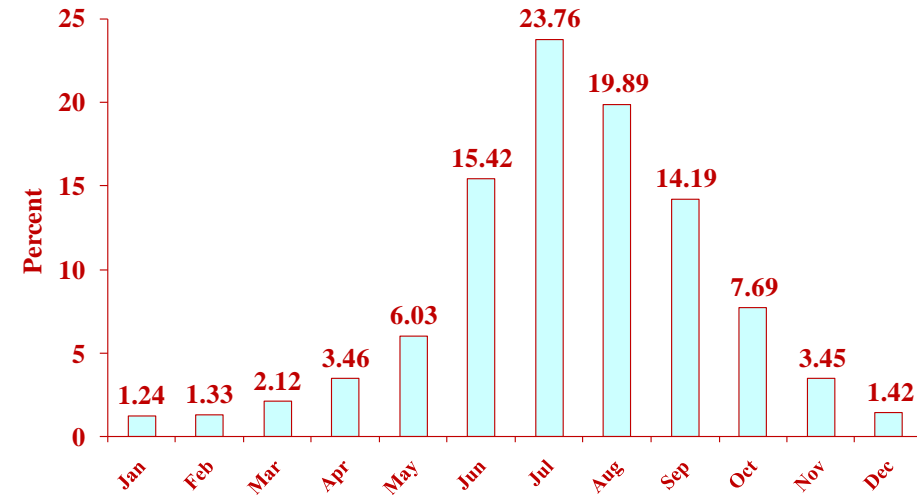
In healthy ecosystems, these services are provided constantly at no or low cost and no or low maintenance

WATER SECTOR IN INDIA – KEY CHALLENGES

High temporal and spatial variability



> 1,000 cm in north eastern region to
< 10 cm in western part of Rajasthan

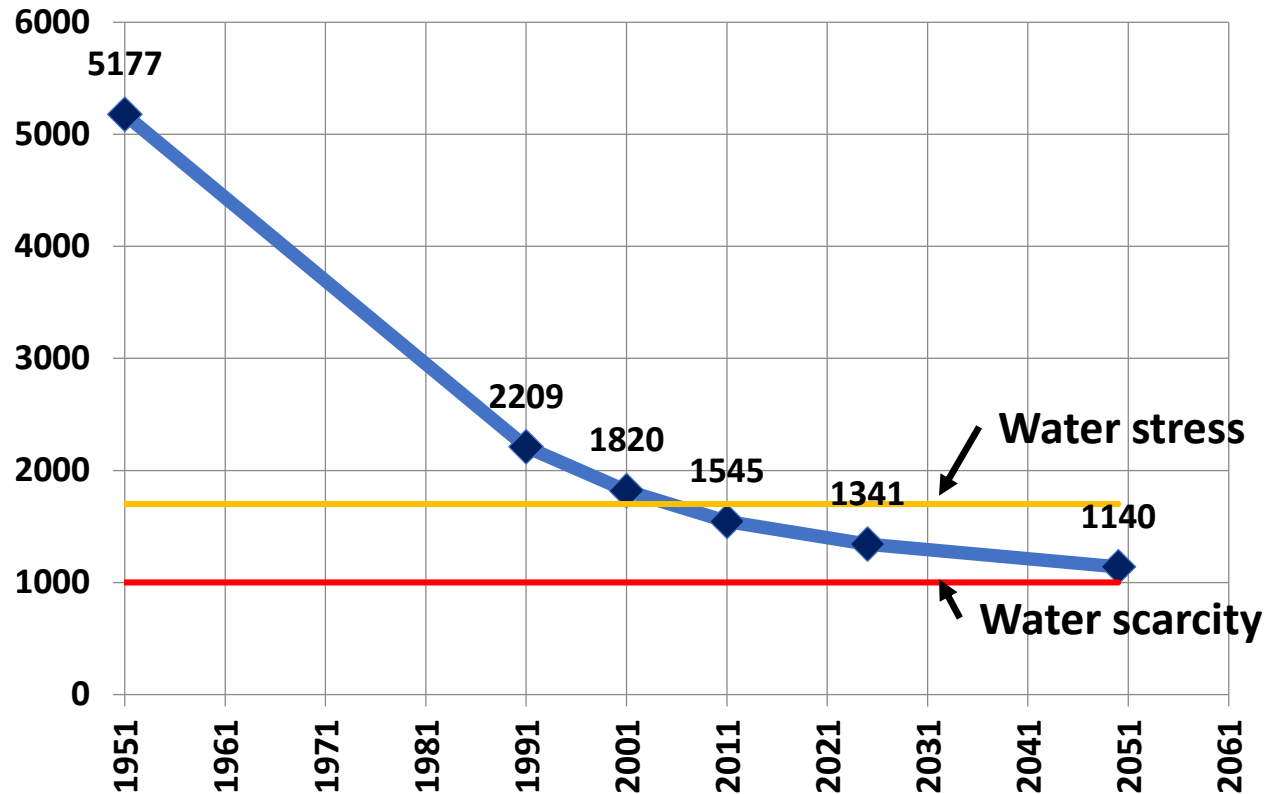


SUGGESTED NATURE BASED SOLUTIONS

- Increase Water Storage (258 BCM → 450 BCM)
- Mission Amrit Sarovar
- Repair Renovation and Restoration (RRR) of Water Bodies – Mission Kakataiya
- Review all existing reservoirs- for possible increase in storage capacity synergizing dam safety, decision support system

WATER SECTOR IN INDIA – KEY CHALLENGES

Reducing per capita water availability – water security



Out of annual average water availability of about 2000 BCM with 4000 BCM annual precipitation.

Unfortunately, only 1133 Billion Cubic Meters (BCM) (<30%) is considered as utilizable

~ 690 BCM of surface water and \\
~ 433 of ground water

National Water Policy (2012) stipulates increasing water storage in its various forms, namely, soil moisture, ponds, ground water, small and large reservoirs and their combination.

- Ensure water security

WATER SECTOR IN INDIA – KEY CHALLENGES

→ **Low consciousness, water is considered as Nature's gift. So public good and not an economic good.**

Water is a economic resources- States fight for water share - in the garb of poor people, rich people siphon resources [National Water Policy 2012 consultation meetings with Panchayati Raj Institutions]

NATURE BASED SOLUTIONS – Economic packaging

Technology is driven by economics, so economic packaging needed

- 1) Water may be adequately priced but people compensated**
- 2) Water bottle charged but refunded on return of plastic bottle**
- 3) Irrigation water priced but MSP increased accordingly**
- 4) Domestic/industrial water charged but individuals subsidized**
- 5) Water trading- In 2018, Gujarat's drought (2017-18) mitigated by trading water of Maharashtra for power, MP for cash and Rajasthan's for next year's – Narmada Control Authority**



Price Rs. 20/-
+Rs.5/-
(refundable on return)

→ **Low water use efficiency Irrigation ≈ 35-40%**
Non revenue Water ≈ 50%

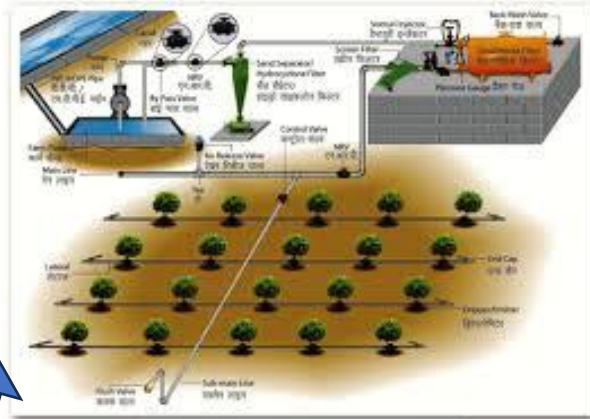
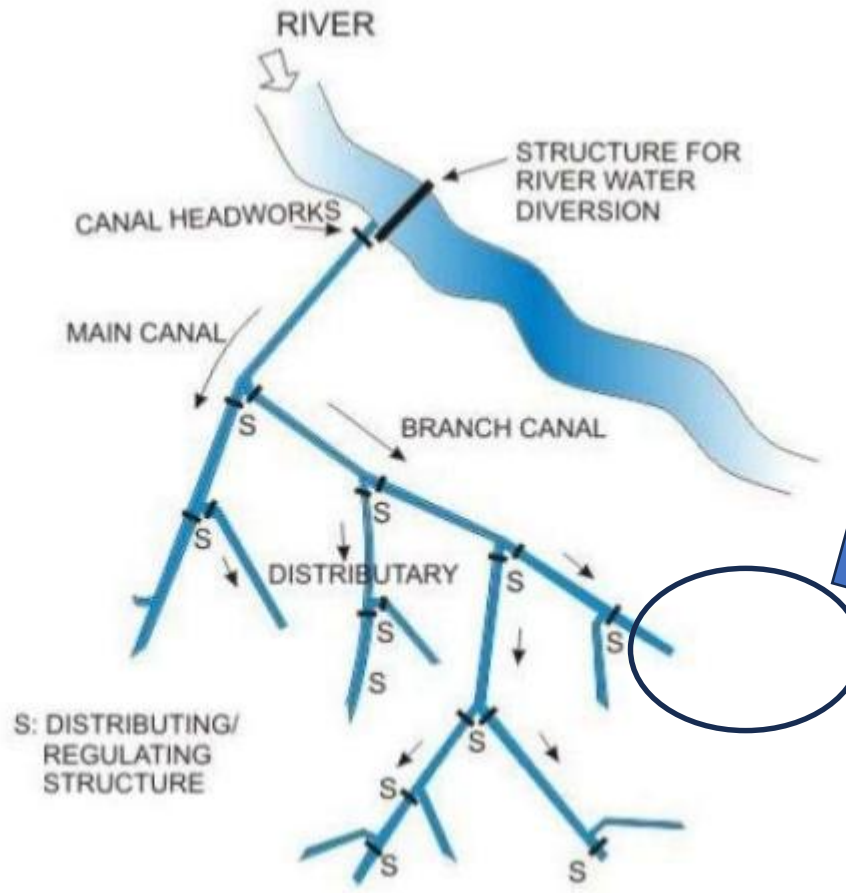
1. National Water Mission

- i. Comprehensive water data base in public domain and assessment of the Impact of climate change on water resource,**
- ii. Promotion of citizen and state actions for water conservation, augmentation and preservation,**
- iii. Focused attention to vulnerable areas including over-exploited areas,**
- iv. Increasing water use efficiency by 20%, and**
- v. Promotion of basin level integrated water resources management**

2. Ministry of Jal Shakti, Government of India set up the National Bureau of Water Use Efficiency (NBWUE) under National Water Mission for promotion, regulation, and control of efficient use of water in irrigation, industrial and domestic sectors.

The Sectoral Group on Irrigation has submitted short term and Long Term strategies for increasing water use efficiency – Water Conservation, Enhancing crop productivity Water Budgeting Water Auditing, Projects planning, appraisal, implementation, revamping PMKSY/CADWM

REVAMPING PMKSY & CADWM – recommended by Sectoral Group (Irrigation)



Pressurized Piped Distribution Network at tertiary level

Estimates of water saving

Present use **650 BCM**

Estimated saving **100 BCM**

Additional irrigation **30-40 BCM**

Domestic and industrial need **30-40 BCM**

Return to Environment **20-40 BCM**

WATER SECTOR IN INDIA – KEY CHALLENGES

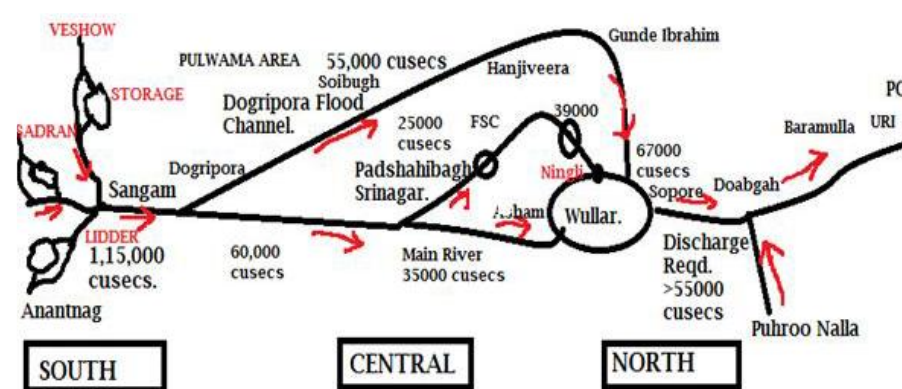
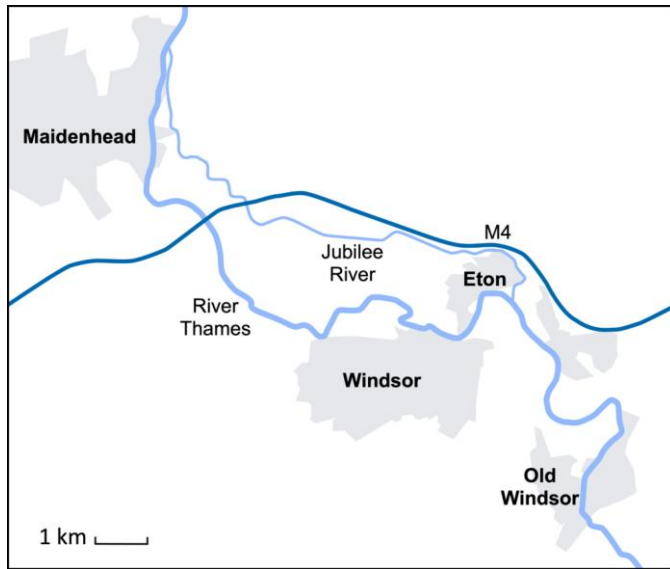
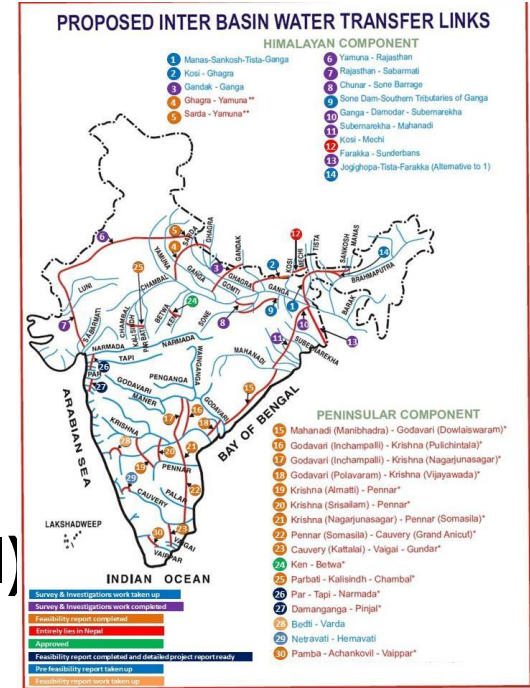
Flooding (Urban flooding)

Convention solution

- Inter linking of Rivers/interbasin transfers

Nature Based solution

- Spill channel (River Thames, Jhelum, Flood flow Canal)
- Sponge cities (interceptors)





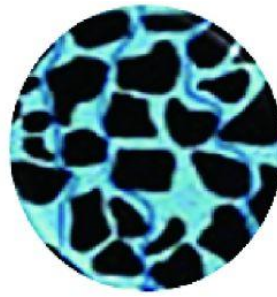
Crop diversification



Mulches



Wind breaks and shelter breaks



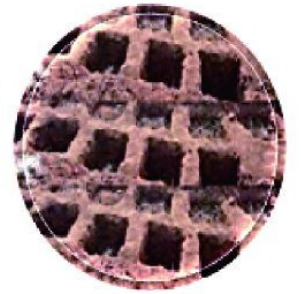
Watershed management



Rain water harvest



Conservation tillage



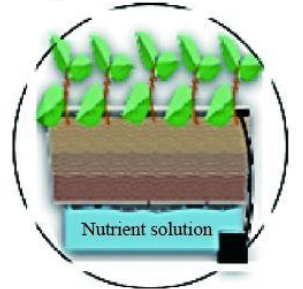
Zai pits



Restoration degraded soil



Dryland agroecosystem



Drip irrigation



Contour tillage



Weed eradication



Mixed-crop livestock system



Temporal and spatial irrigation



Nutrient management



Agroforestry



Greenhouse

THANK YOU