

Way Forward

Irrigation Practices

Micro irrigation

Source: 'Micro Irrigation at a Glance', Ministry of Agriculture & Farmer Welfare

20 to 48% Saving of Irrigation water



Increase in Farmer's Income



10 to 17% Saving of Energy



Benefits of Micro Irrigation

Area Covered 77.28 lakh Ha



20 to 38% increase in Crop Production



30 to 40% Saving of Labour Cost



11 to 19% Saving of Fertilizers



Centrally sponsored Micro Irrigation Scheme launched in January 2006

Scaled up to National Mission on Micro Irrigation (NMMI) in June 2010

NMMI subsumed under National Mission on Sustainable Agriculture (NMSA) in April 2014

Subsumed under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) in April 2015

Piped Irrigation



- Less Evaporation & Conveyance Losses
- Less Operation and Maintenance Cost
- More convenient to operate
- More efficient utilization of water
- Better irrigation scheduling & allocation
- Less problems like theft
- Tap here for Detailed information

Conjunctive Use of Surface and Ground Water



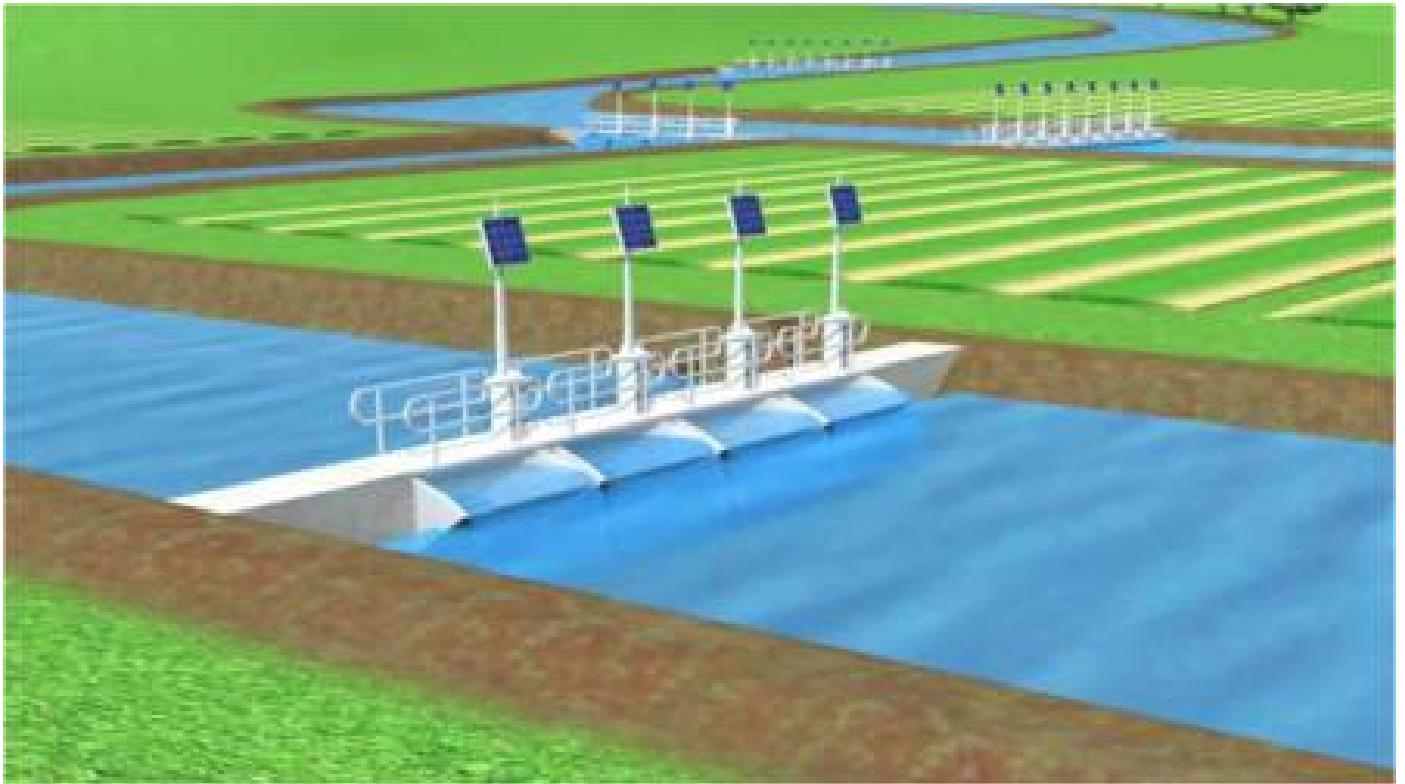
- Use of both surface and ground water alternatively as per availability
- Facilitates assured irrigation to the crop
- Method to avoid overexploitation of ground water
- More efficient utilization of water
- Better demand and supply management
- Mitigation of water logging due to rise in ground water level

Command Area Development



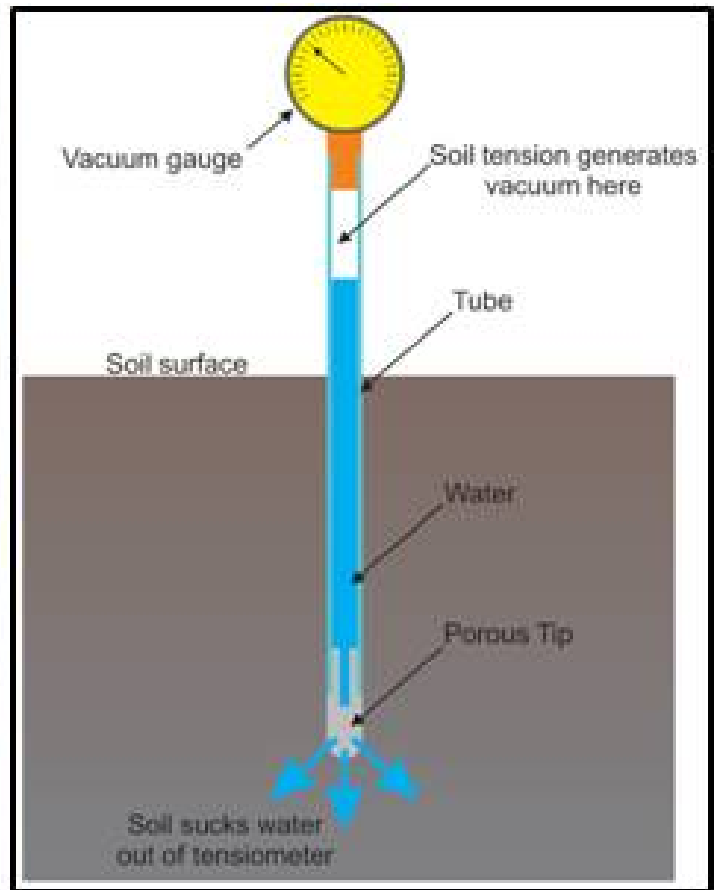
- Inadequate CAD is main reason for non utilization of irrigation facilities created.
- Field drains used to take out water from the farm thus preventing water logging, soil salinity and overuse of water.
- Adequate and properly lined CAD will lead to better Water Use Efficiency
- Less loss of water in conveyance and less erosion of soil.
- It'll ensure 'Har Khet ko Pani'

Supervisory Control And Data Acquisition (SCADA) System



- Very efficient regulation of irrigation water
- Facilitates remote operation and better data acquisition
- Better measurement and allocation of irrigation water
- Appropriate irrigation scheduling
- Less labour intensive
- Better sustaining if non conventional energy sources are utilised for running the system

Smart Irrigation Controllers



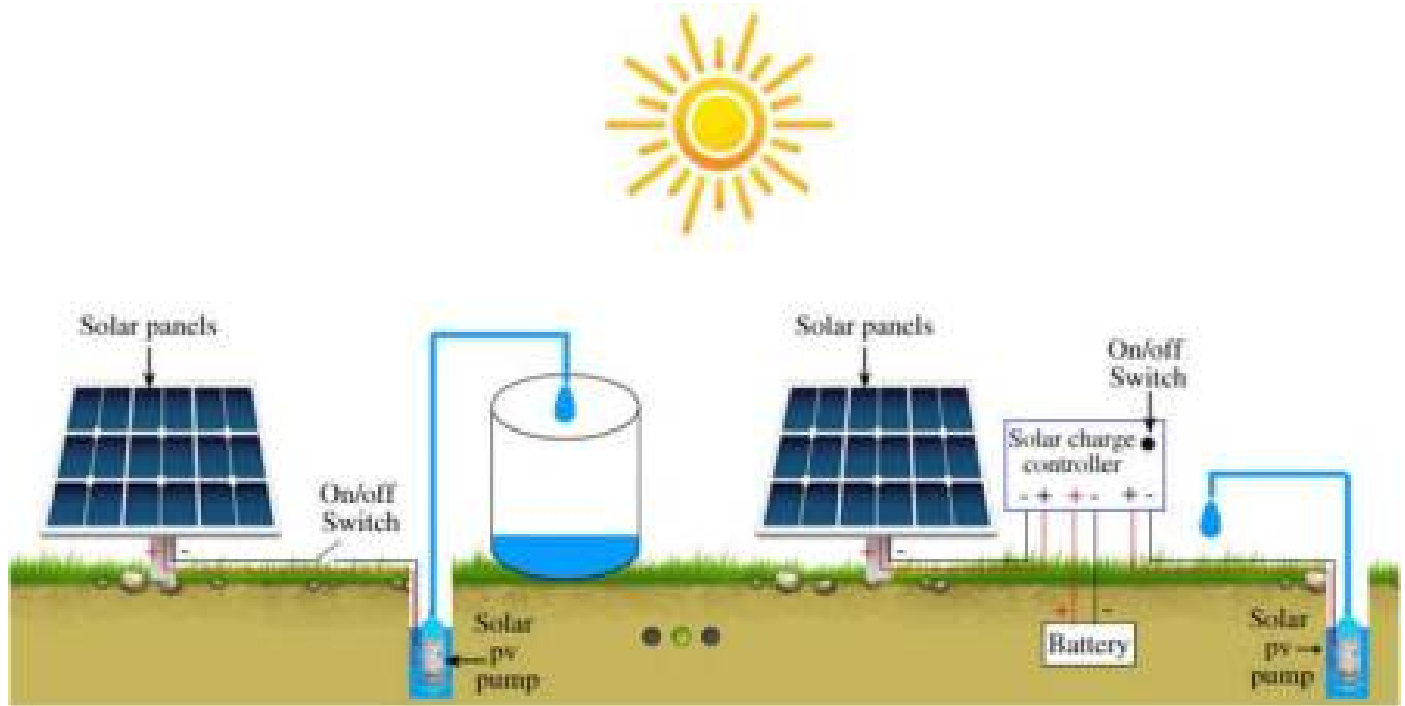
- Smart controllers are mainly sensor based devices
- Monitor/measures humidity, soil moisture, temperature etc.
- Controls operation of irrigation system based on sensor inputs and irrigation requirements
- Optimizes the delivery of irrigation water to the crops
- Facilitates better irrigation scheduling

Wind Powered Irrigation



- Abundantly available wind energy can be utilised for drawing/supplying water
- Requires no fuel, hence green, clean and climate smart energy source
- Can be installed in remote areas where other water pumping methods are not feasible
- Operates satisfactorily in wind regimes (12-18 km/hr) for low suction heads.
- India is having over 1 lakh MW of Wind Energy potential.

Solar Powered Irrigation



- India has 250-300 sunny days in a year.
- This abundant and reliable natural resource can be utilised for solar powered pumps.
- It requires no fuel, hence green and clean energy source
- India has solar energy potential of about 7.5 lakh MW
- Helps in adapting to the climate change in sustainable manner

Less Water Consuming Agricultural Practices

Modified Seed



- Low water consuming seeds have been developed through genetic improvement
- Direct seeding rice are sown in many part of the country requires 15% less water
- Such practice may be adopted in drought affected/arid regions
- Some varieties don't require any
- pesticides, hence no water quality degradation

Laser Leveler



- It facilitates leveling of field using laser technology.
- Improves water coverage and reduces the water requirement for land preparation.
- Improves crop alignment, crop uniformity and hence crop productivity.
- Reduces time to complete agricultural activities
- It can save upto 30% of water.

No tillage Farming



- While harvesting previous crops, the roots and part of the stems are left as it is
- New crops are grown in the space between previous crops without ploughing
- Increases infiltration of water into the soil
- Reduces Evaporation losses
- Reduces requirement of irrigation water
- Less soil erosion from the field
- Increases organic matter retention and cycling of nutrients in the soil

Mulching



- Mulches are loose coverings or sheets placed on the field for retention of soil moisture
- Reduces Evaporation losses
- Reduces requirement of irrigation water
- Maintains uniform soil temperature hence reduces weed growth
- Reduces soil erosion and compaction of soil due to impact of heavy rains
- Also used to protect soil between two crops

Cropping Pattern Planning



- It is planning of type of crops to be sown as per availability of irrigation water for a year
- It can be best achieved through participation of farming community.
- It facilitates judicious utilization and equitable distribution of water
- Cropping pattern planning should also consider retention of soil fertility
- Agro-climatic features and existing R&D outcomes should also be taken into account.

Shelter Belt



- Trees are planted on the boundaries of the field as a barrier to wind
- Due to less wind, evaporation from the field is reduced, requiring less irrigation water
- Reduces soil erosion from the field
- Reduces water logging and soil salinity
- Farm forestry can also be promoted through shelter belt facilitating more income to farmer
- Climate friendly initiative

Weed Management



- Weeds cause 10-80% crop yield losses.
- It also affects product quality and causing health and environmental hazards.
- Weeds consumes water which was allocated for the crops hence affects crop growth
- Traditionally, weed control in India has been done manually
- Integrated Weed Management using herbicides need to be adopted throughout.

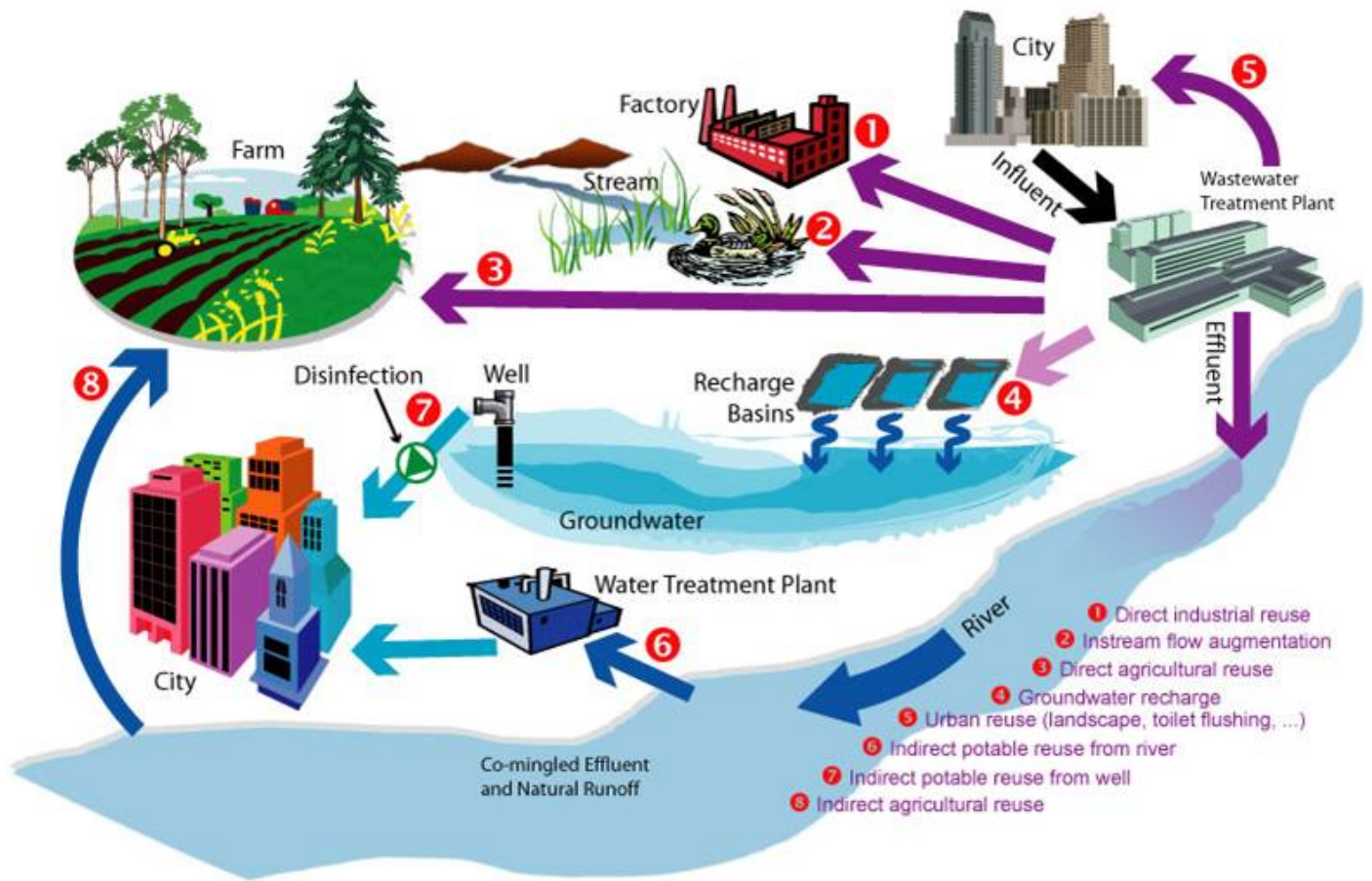
Management Practices

Participatory Irrigation Management (PIM)



- Water User's Association are formed to manage local irrigation system
- Creates a sense of ownership amongst users
- It ensures better O&M, equitable distribution rotational irrigation water (warabandi/shejpali)
- Smooth resolution of local water disputes
- Effective implementation of Governmental policies and schemes through WUA.
- Judicious utilization of water and better WUE

Recycle and Reuse



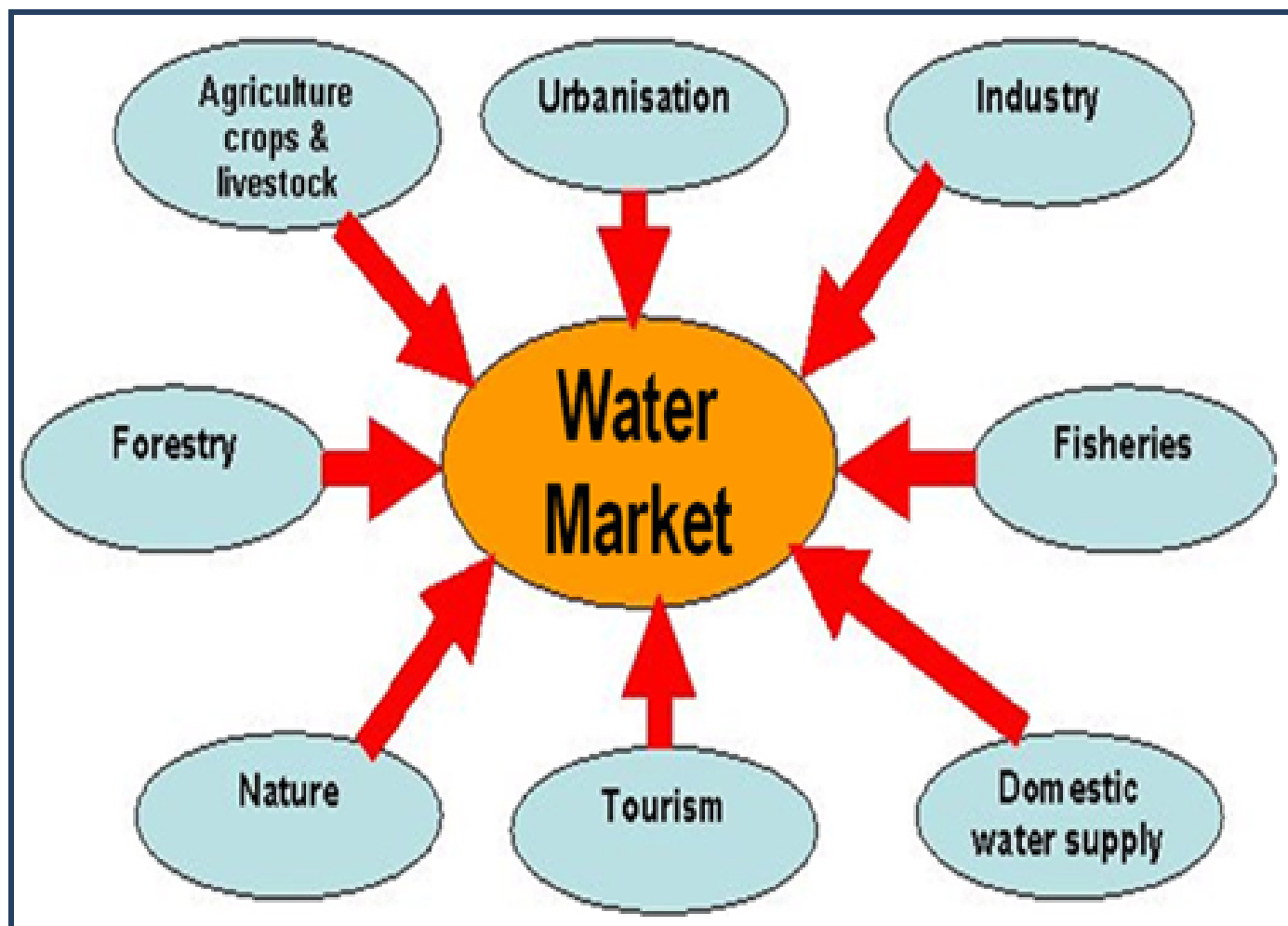
- Recycled water is an extra source of irrigation
- Independent of the precipitation
- Reliable source of water as waste water is generated throughout the year
- Reduces load on natural water sources
- Wastewater reuse alleviates the anthropogenic impacts on the environment
- About 50 billion cubic meter of waste water will be generated in India in near future

Water Pricing



- Though water is free gift of nature, it requires investment/infrastructure for making is usable
- Water is therefore treated as economic good and priced for various uses
- Affordability, recovery of investment, differential tariff are general basis for pricing
- It leads to judicious utilization of water and hence enhanced water use efficiency
- It promotes innovations in water usage

Water Market



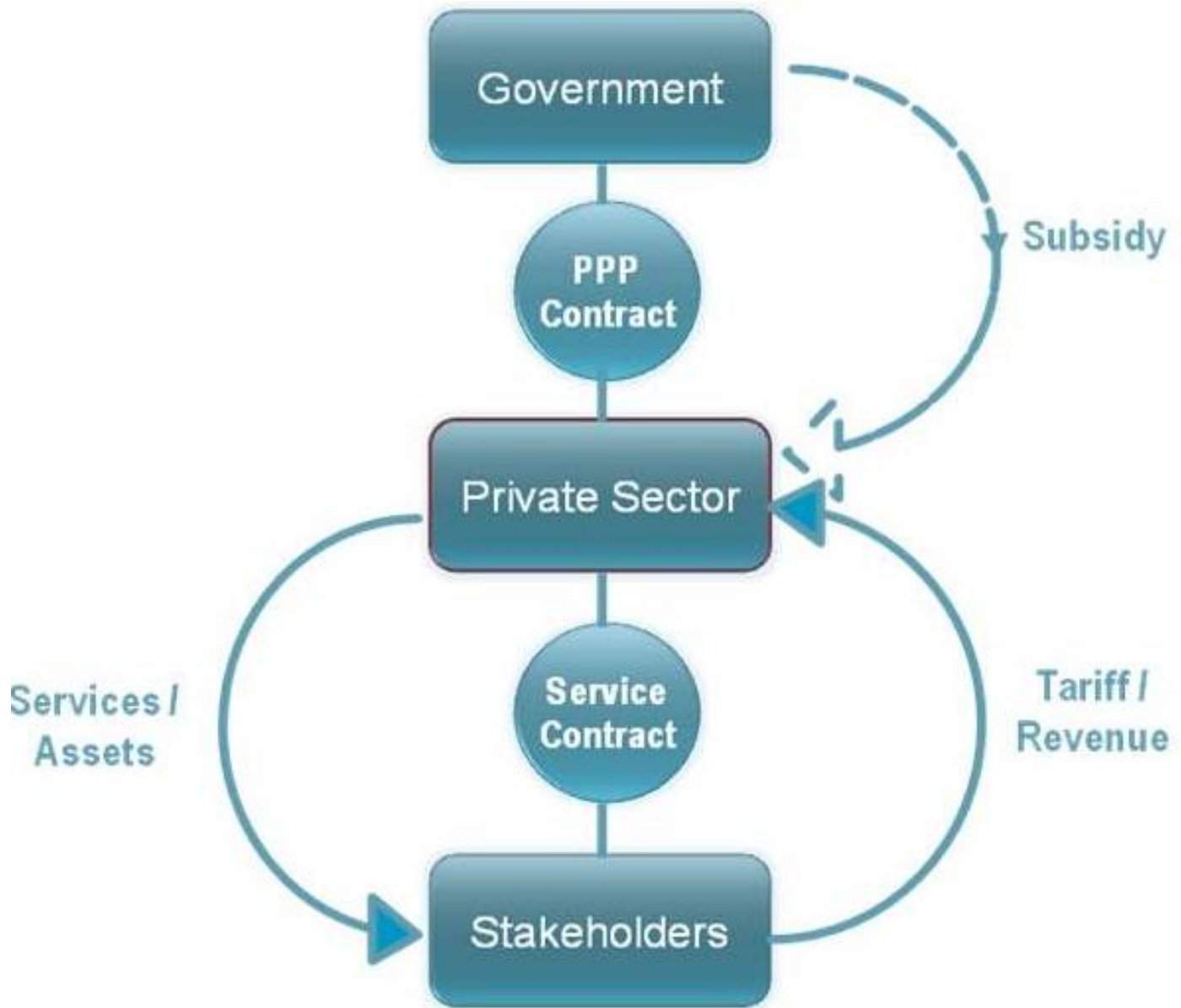
- Water markets facilitate buying and selling of entitled water amongst stakeholders.
- Incentivizes users to save water and trade the same in water market.
- It promotes innovations in water usage
- For implementation of water market in India, water entitlement should be clearly defined
- Strong regulatory framework is mandatory for water market.

Water Footprint



- Water foot print is the amount of fresh water required to produce any goods / services
- Consists of Green(rainwater), Blue(surface & groundwater), Grey (to dilute pollution caused)
- For e.g. 2497 litres of fresh water required to produce 1 kg of rice, same is known for all crops
- Using this concept and water availability, cropping pattern can be decided at local level
- Overall which crop to be grown in which part of the country can also be decided

Public Private Partnership (PPP)



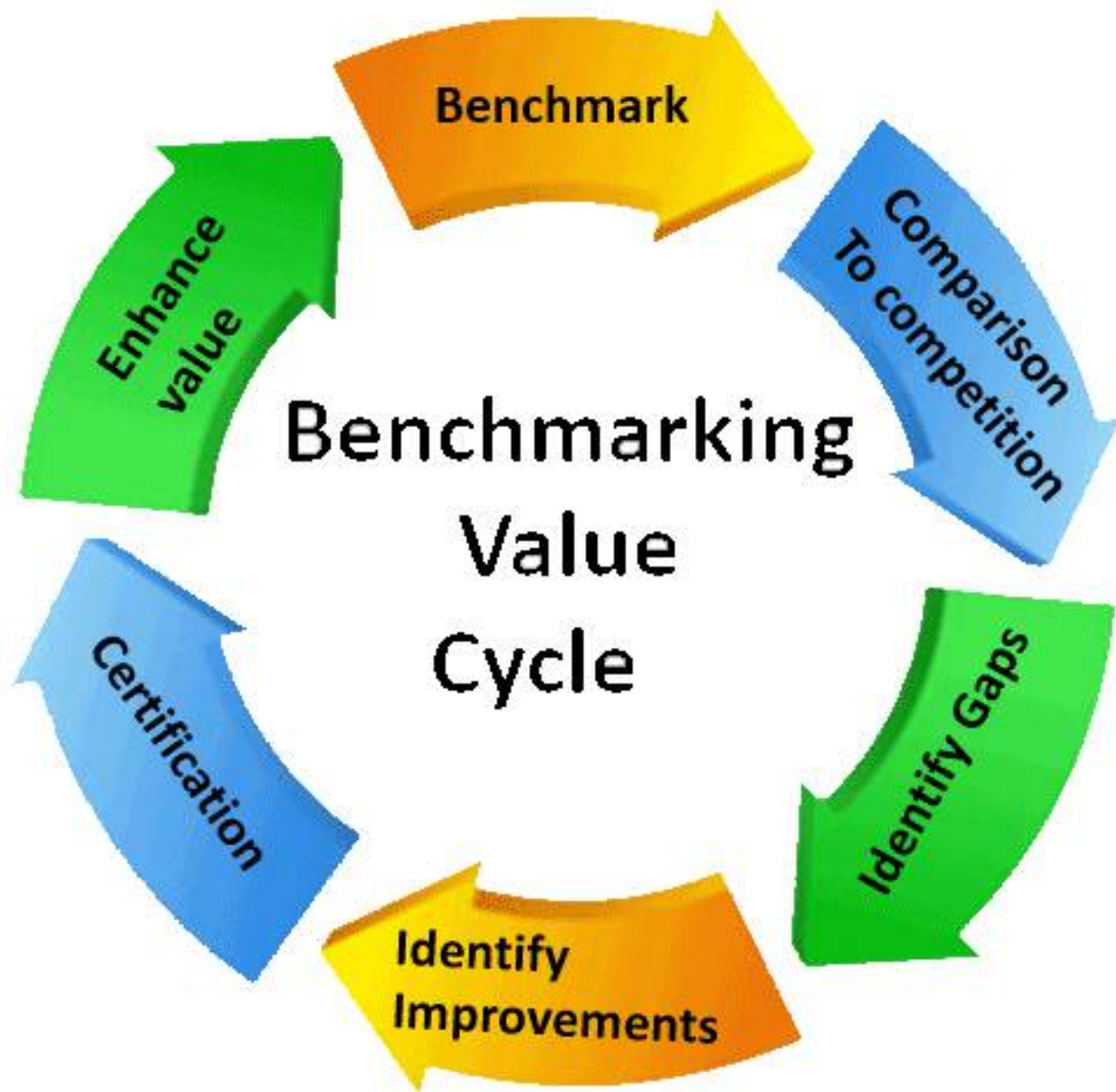
- Long term contract between Govt (as regulator) & Pvt sector and Pvt sector & farmers
- Private sector will make all investments and provide services to the farmers and charge tariff
- A new avenue of funding for irrigation sector
- Farmers will have better services & option to remove/choose service provider
- Private sector will explore innovative measures to maximize profit (which is absent at present)

Water Budgeting & Auditing



- Water budget is an accounting of water available for utilization in a year
- Water audit is a process to verify whether allocated water is properly utilised or not
- It ensures efficient utilization of available water
- Reduce over irrigation and losses thereby
- Facilitate proper cropping pattern planning
- Best suited for arid/drought prone region

Performance Evaluation & Benchmarking

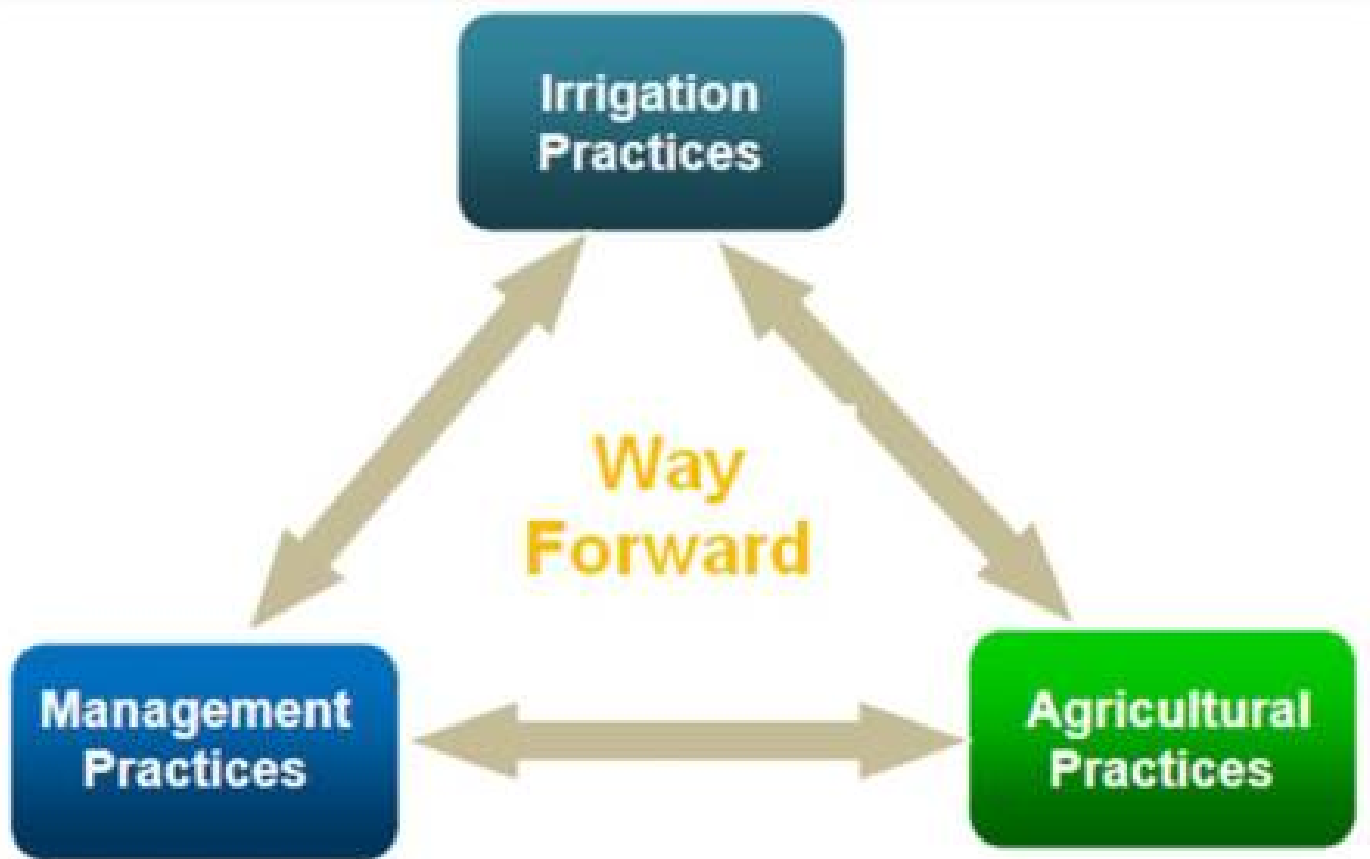


- Performance evaluation is carried out to review the functioning of projects as envisaged
- Benchmarking is comparison of a project with the best performing project in that region.
- It helps to identify the bottlenecks in a projects
- It brings healthy competition amongst projects
- It enhances crop productivity and water use efficiency
- Performance Evaluation & Benchmarking are cost effective management techniques

Cooperative Farming



- In Cooperative farming, each farmer remains the owner of the land & farming is done jointly
- Scientific and mechanized farming is possible
- Increases crop productivity and efficient utilization of irrigation water and land
- Saves overall expenditure and protects mutual interest.
- It complements participatory irrigation management



End of Module
Thanks for Visiting