Issues in adaptation of new technologies in Government Projects

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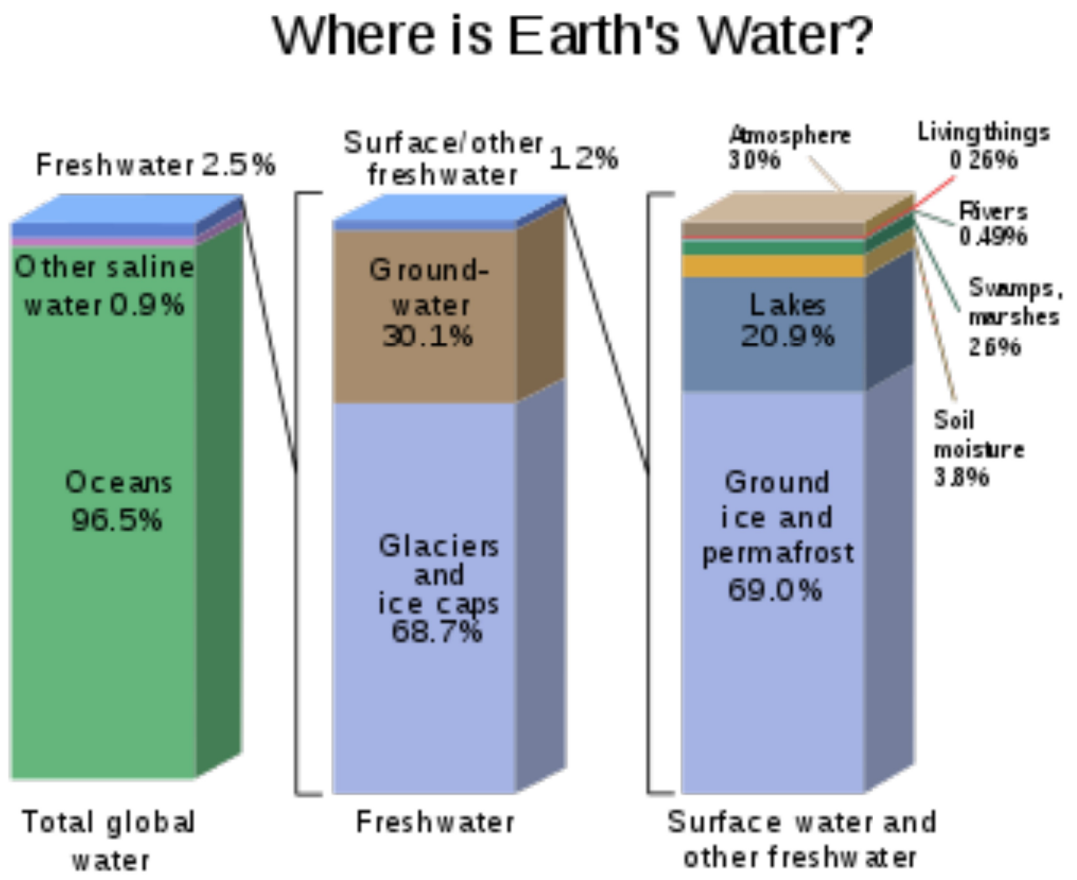
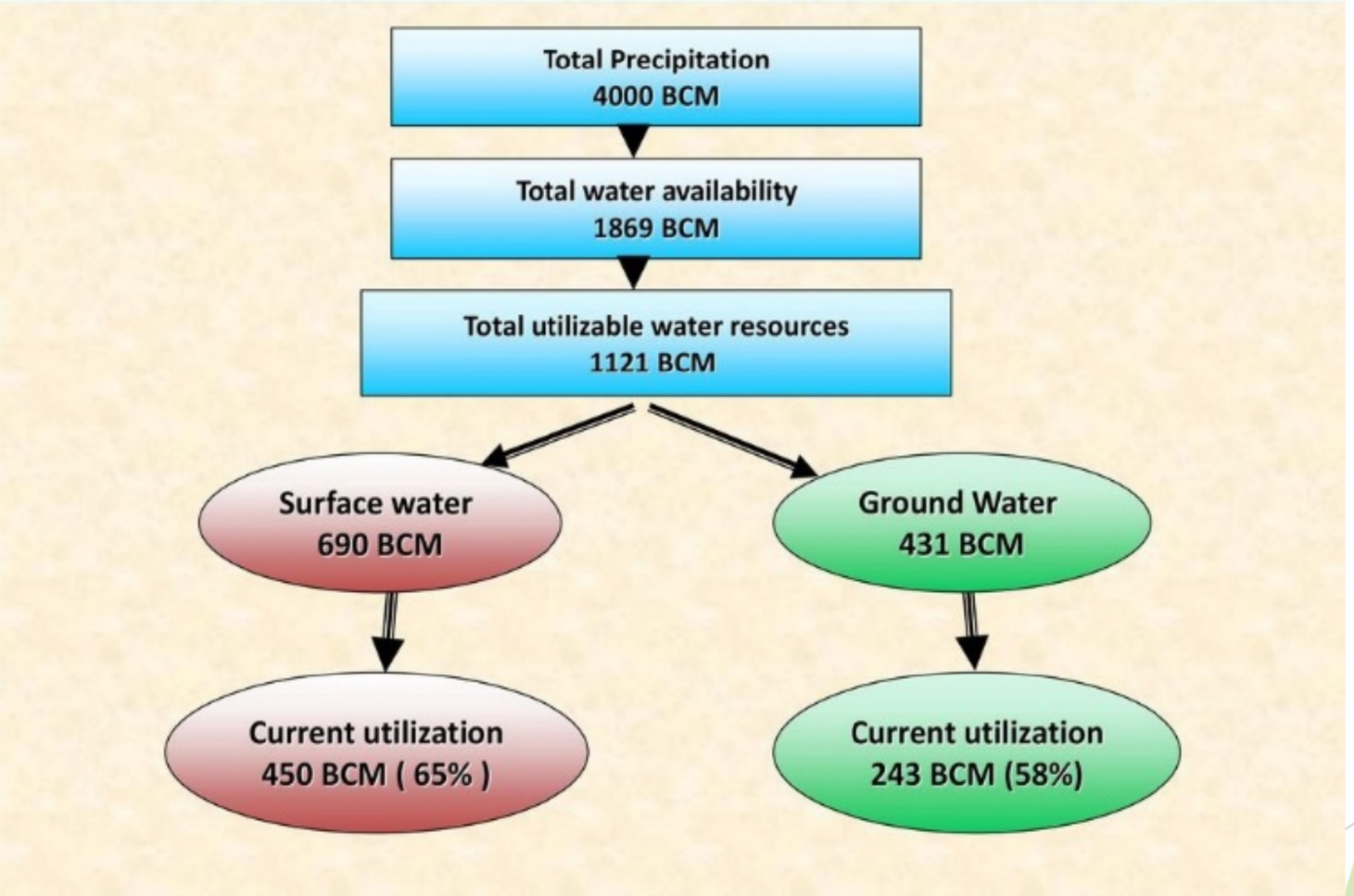
Distribution of Earth's Water



Water availability in India



Government Schemes: CADWM Program




- CAD Program was launched in 1974-75.
- It was restructured and renamed as CADWM in 2004.

Objectives of CADWM Program

- Bridge the gap between Irrigation Potential Created(IPC) and Irrigation Potential Utilized(IPU)
- Improve Water-Use efficiency
- Bring sustainability in irrigated agriculture in a participatory environment
- Increase agriculture productivity & production

Distinct Features:

- Ensures last mile connectivity
- Area is unit of network development, instead of its linear measures

Government Schemes:PMKSY

PMKSY launched in 2015-16

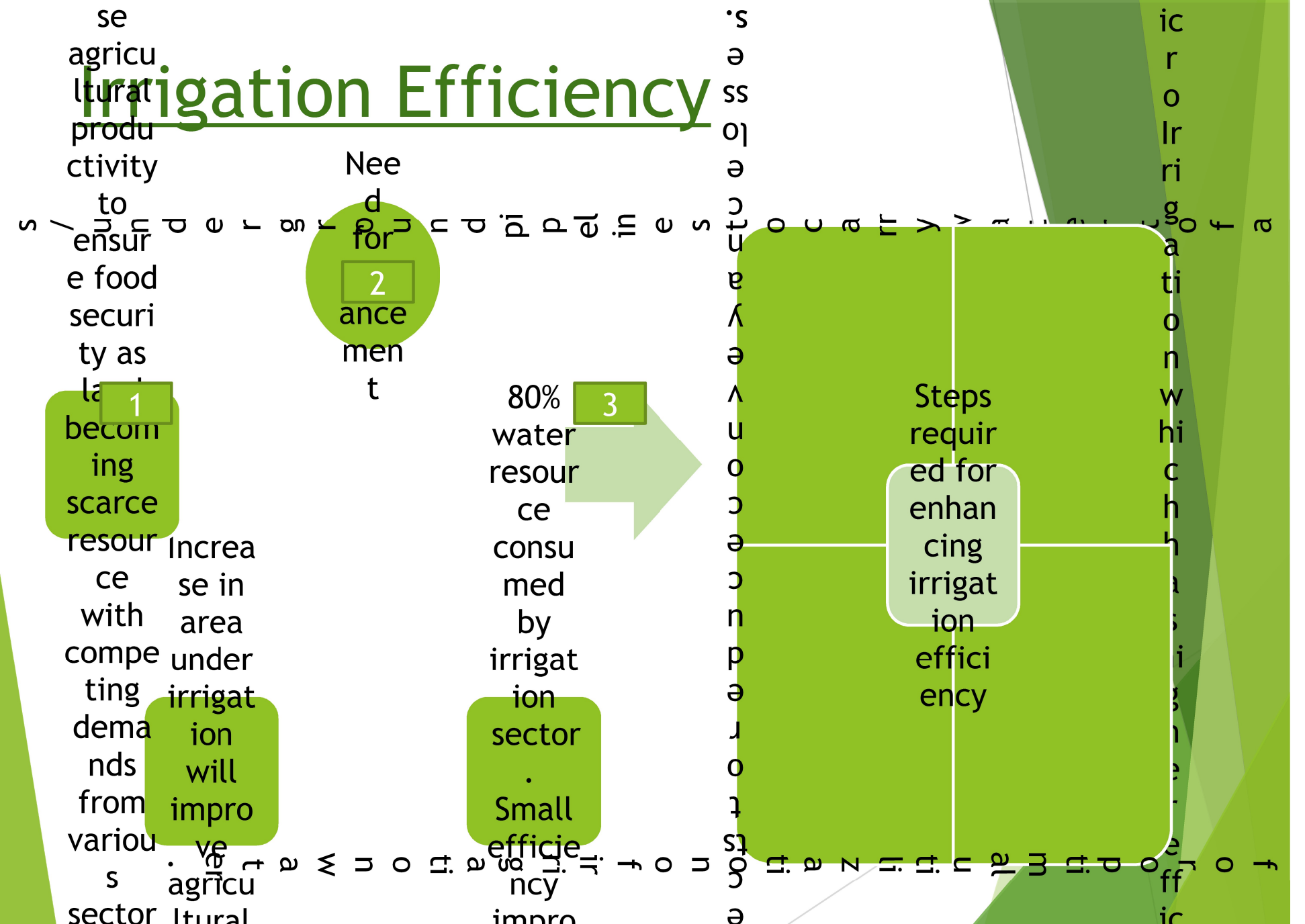
Components of PMKSY

- AIBP by MoWR,RD&GR
- Har Khet Ko Pani(HKKP) by MoWR,RD&GR
- More Crop Per Drop by MoAG&FW
- Watershed by MoRD

Objectives

- Realise full potential of 99 prioritized major & medium irrigation projects including CADWM works.
- Improve on-farm Water Use efficiency
- Strengthen PIM through formation of WUAs
- Coverage under Micro Irrigation- 10% of conventional CCA
- Funding via loan from NABARD's Long Term Irrigation Fund (LTIF)

Irrigation Efficiency



New Initiatives

1) Use of Underground Pipe Distribution Network (UGPDN) in place of open channels. Eg Sardar Sarovar project of Gujarat

- Underground PVC pipes offtakes from distributory/minor to carry water to fields.
- Each pipe has about 5-6 turnouts. One turnout serves CCA of 6-8 ha.
- Water can be withdrawn from the turnout by operating a valve.
- There is a single valve which is with the WUA. So only one turnout can be operated at a time, as per turn.
- Thus when the turn of tail end farmer comes, only last turnout can be operated. This system ensures that tail end farmer will get due share timely.
- Other advantages of UGPDN are reduction of seepage loss, evaporation loss, pilferage of irrigation water and avoiding cost of land acquisition.

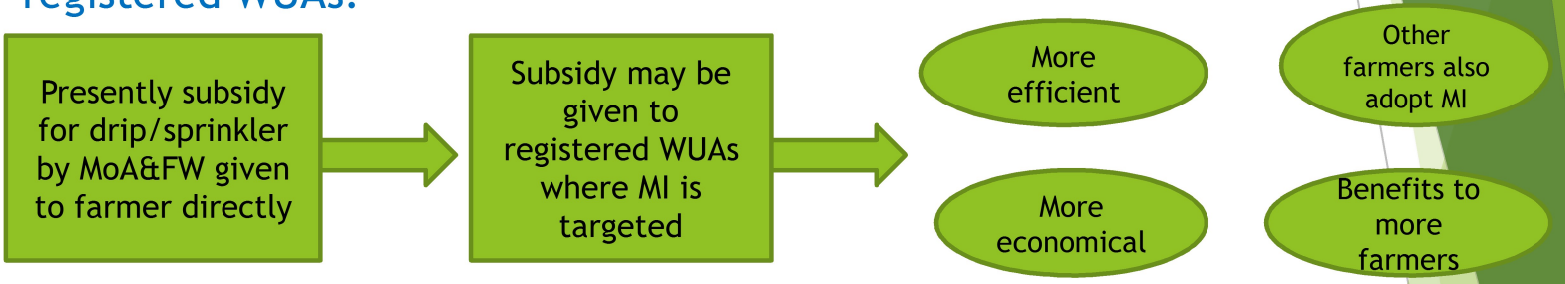
Piped Irrigation Network (PIN)

- Micro-irrigation coupled with the underground piped irrigation network will further help to achieve maximum efficiency in the water application.
- Use of pressurized pipe system solves inherent problems like land acquisition, wastage of farm land, low irrigation efficiency, seepage, etc.
- The formation of robust micro-irrigation system along with piped irrigation network for conveyance, distribution and application will result in efficient irrigation system, thus, achieving the Government's objective of the more crop per drop and even increase in the farmers' income.

New Initiatives

2) Enhance Micro Irrigation coverage to 30% under ISBIG scheme.

3) Promote Cluster Level Micro Irrigation: subsidy for drip/sprinkler system by MoA&FW may be provided to registered WUAs.



4) Better coordination between State Irrigation department and State CADA by creating a single unified authority.

5) Strengthening of PIMs: Financial grants and handholding support to registered WUAs to make them ready for taking over the CAD works.

Challenges of CADWM Implementation

- Reluctance by farmers to give land for CADWM works (field channels) unless assured water supplies in canals is visible.
- Progress of CAD works coupled to progress of irrigation works i.e. irrigation network upto minor level must be completed to start CAD works.
- Unlike AIBP activities, CADWM works are spread over vast areas and executed through small contractors/WUAs.
- Inadequate institutional capacity of State governments for enhancing annual physical targets and supervision related challenges.
- CAD activities on cultivated land can be carried during non cropping period which is limited to 3-4 months in a year.
- Coordination between Irrigation department and CADA authorities in State.

Indian Scenario

- In India, Agriculture is the backbone of the economy and has been facing various challenges in recent years - lower productivity, resource crunch and erratic weather, all of these translating into lower returns.
- One of the most critical issues for the farming community is availability of water as the fresh water withdrawals are highest by the agricultural sector.
- For agriculture to flourish, more and more irrigation projects with the efficient technologies shall be constructed but, since the construction of new and large dams is going to be difficult owing to land acquisition issues, R&R issues and Forest clearances, the options of water resources development are getting restricted.
- The major challenge being faced in the water resources sectors is the issue of water management with the rainfall pattern becoming unpredictable owing to climate change issues.
- Thus, the focus needs to be on improved water management and better water-use efficiency. There is tremendous scope to improve the surface irrigation efficiency that presently hovers between 35 to 38%.

Use of Micro Irrigation

- Command Area Development through micro irrigation such as use of Drip/Sprinklers systems is one of the effective technology for bridging the gap between Irrigation Potential Created (IPC) and Irrigation Potential Utilised (IPU).
- Micro-irrigation involves a replacement of conventional On Farm Development (OFD) works with the intent of improving the water use efficiency. The water use efficiency in case of MI varies from 65 to 90% vis-a-vis flow irrigation which is about 35-38%
- Planning of micro-irrigation ensures maximisation of the Culturable Command Area (CCA) beyond the areas under gravity flow and assured irrigation to tail enders.
- Micro-irrigation infrastructure includes components of sump, pump, HDPE pipelines, and pertinent devices. Other components such as land levelling, drainage works etc. would be reduced, or entirely discarded; enabling certain cost savings which is expected to offset the higher cost of Micro-irrigation infrastructure. The infrastructure for MI shall provide pressurised water at the inlet of the farm.
- Under CADWM Programme, central assistance is also being

Micro Irrigation infrastructure

Use of Drones

- Use of unmanned aerial vehicles (UAVs), also known as drones, and connected analytics has great potential to support and address some of the most pressing problems faced by agriculture in terms of access to actionable real-time quality data.
- Drones can be involved in monitoring the water loss during the conveyance of water to the fields from the canals or even the losses in the canal itself.
- Water tight canal operation is possible only with the dynamic canal section monitoring (before, during and after water release) and execution of appropriate remedial measures in plugging the leakage or temporary diversion in maintaining supply.
- Survey maps through drones can be developed for effective implementation of cropping pattern in the command.

Conclusion

- Talking of the irrigation sector, there are number of upcoming technologies such as Micro-irrigation, adaptation of Drip/Sprinklers, Piped Irrigation Network etc. which can be adopted in irrigation sector.
- Also, these are proving to have the potential to change the face of Indian agriculture. But the part lacking in their implementation is purely awareness and self-motivation by the stakeholders.
- There are far better ways to introduce new technology in a Government projects but the process needs to start with research to understand the status quo and promote these technologies among masses.
- Observation, testing and surveys can help reveal how a new technology will affect the project.
- Project authorities and stakeholders needs to be brought together on a single platform to discuss the effectiveness of the newer technologies. And the farmers shall be encouraged to take up these technologies in a big way.
- In a large organization, especially in the public sector, management has to make the best path easy.

THANK YOU