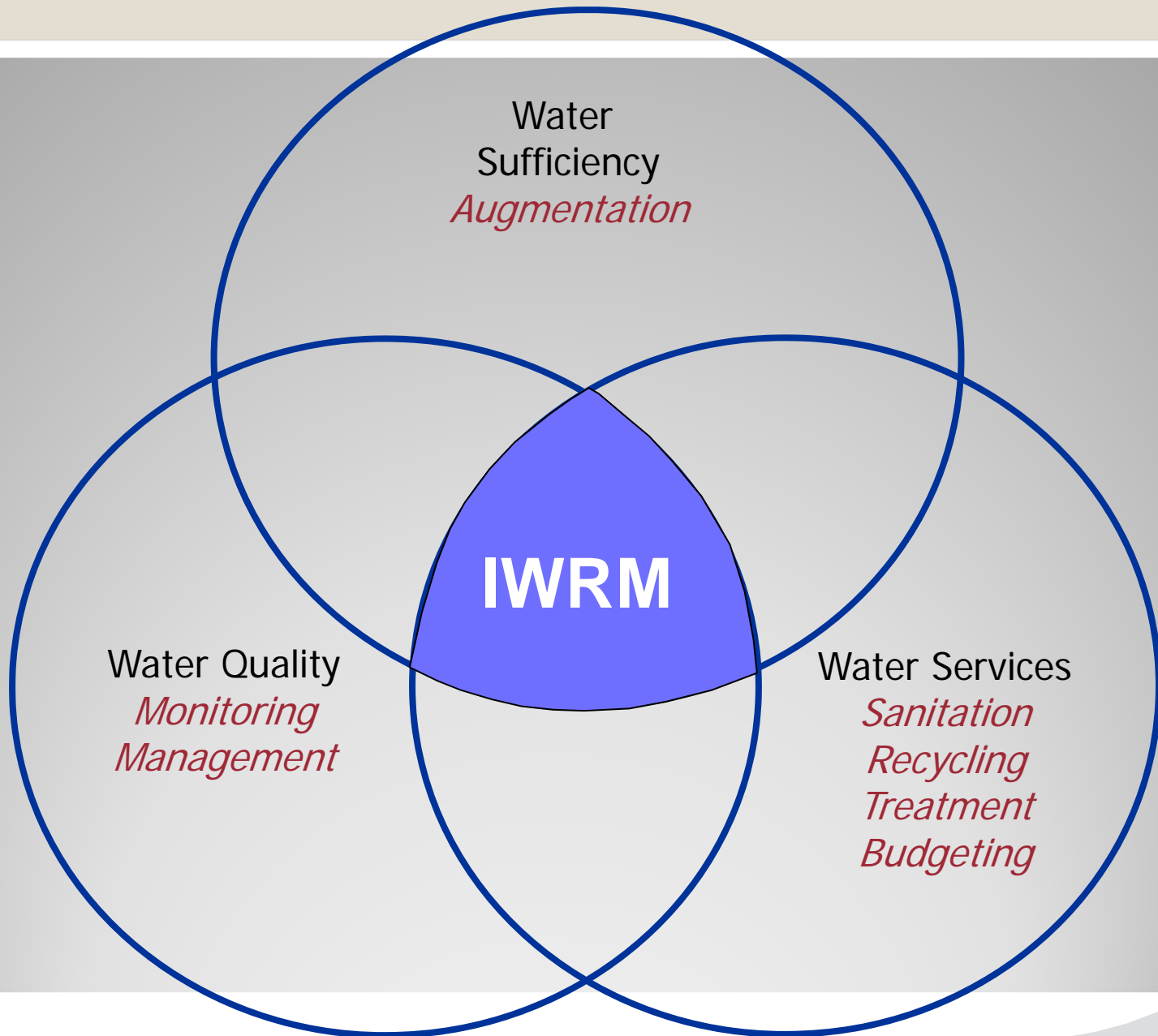


Role of Check Dams in Sustainable Drinking Water in Bundelkhand

Sonal Kulshreshtha
Development Alternatives



- Water tables are going down by approximately 0.5 m per year in some of the zones in Bundelkhand
- Water table has reached to 1500 ft BGL in and around Bangalore
- Vegetative Surface cover is reducing at accelerating rate, impervious surface area is increasing
- Water drains quickly, upper region getting low chance of recharging aquifers
- Climate Change studies reflect that in next 20 years precipitation may reduce further by 15%
- Frequency of drought is increasing significantly

Less water recharging

- Check Dam is engineering way to reduce the runoff and water storage by creating a barrier in the drainage line
- Recharge opportunity can be increased significantly, if the check dams is made for the purpose
- Multiple uses are possible
- In and around, livelihood opportunities can also be created

Check Dams



Check dam - Rajpura , UP

- Semi Arid region, drought prone region
- Frequency of drought increased recently
- Climate Change studies shows further declination in rainfall quantity and increase in drought frequency
- In recent past, Bundelkhand had faced severe migration pattern not only in search of alternative livelihood but also due to lack of drinking water

Bundelkhand: Context

- Shallow Soil depth
- Rocky Substrata
- Low fracture density
- Steep variation in spatial water table depth/availability
- Poor yield – high drawdown
- First fracture depth 40- 60 ft
- Second fracture mostly occurs 80- 120 ft BGL
- After 130-140 ft only hard rocks exists (almost nil chances of water availability)

Bundelkhand

- Irregular aquifer (shape and depth)
- Limited surface water resources
- Drastically reduced number of operational hand-pump/bore-wells during summers
- Poor Quality Water (biological and chemical contamination (Fluoride, Nitrate are major))

Drinking water issues in Bundelkhand

- High cost involvement in water development (due to high failure rates)
- Most of the wells/ hand pumps/ bores got dried during summers
- Fetching time vary from 2 to 5 hours in summers due to distant water sources/ long waiting times
- High Migration rates
- Few sources for all purpose
 - Drinking, livestock, bathing. Washing, domestic purpose etc
- Heavy time involvement and increased drudgery for fetching water

Implications









- Rooftop rainwater harvesting
- Water harvesting through watershed measures
- In-situ moisture conservation

Water harvesting Options

- Check Dams

- Provide recharge opportunity at large surface area
- Water Harvesting and Storage structures
- Can recharge multiple aquifer, depending on the scale
- Provide opportunity to use water directly (surface water storage)
- Enhance moisture availability

Water Harvesting and Check Dams





- Provides source of water for livestock: reduced pressure on Drinking water sources
- Reduced time required for fetching water
- Water Quality improves with ground water recharging (Fluoride)

Benefits

- DA has constructed 180 check dams in last 20 years
- Results over 36 check dams have been observed
- Open wells around 500 m to 1 Km got recharged round the year
- Open wells in 1.5 radius of check dams have extended water availability by 2 to 3 months
- Hand pumps in and around 2 kms have higher and regular yield (normally round the year)
- Number of hand pumps working in summers increases to double (in the villages within the range of 2 kms of check dams)
- One village where the water harvesting structure was built, source of water delivery system remained active round the year

Impacts

- Increase in no of students :21% – primary, 65% middle
- Fetching time reduced to less than 1 hr from 3 hours
- Use of toilets increased due to nearby water availability

Impact of Drinking water Systems

- A 1.5-2 m check dam can recharge an area of approximately 10 hectares
- If average annual rainfall is 850 mm
 - Total volume saving potential: 85,000 cum
 - Consider comprehensive efficiency: 15%
 - Water extracted could be enough for one year drinking/domestic water requirement of a village inhabitation of 500 people (@70 lpcd drinking/domestic purpose)
- Treatment cost at standard rates: INR 1,20,000 (one time investment)
- Returns @ 1 p per liter = 1,27,500 (every year)

Simple Cost Economics

Thank You