Water resource management at local level

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WATER RESOURCE MANAGEMENT AT LOCAL LEVEL

IMPORTANCE OF COMMUNITY MANAGEMENT

JAIPUR
• WATER AS A RESOURCE – IT FLOWS
• ESSENTIAL FOR SOCIO-ECONOMIC DEVELOPMENT
• MAINTAINING HEALTHY ECO SYSTEM – SO AS TO CONTINUE TO PRODUCE ECO SERVICES
• RAINFALL IS FINITE
• AT WHAT STAGE OF JOURNEY FROM SKY, SOILS, TO AQUAFIERS TO RIVER AND SEA, IT IS CAPTURED
• BY WHOM AND HOW MUCH
• BY 2025 TWO THIRD OF INDIA WILL HAVE LESS THAN 1,000 KILO LITRE/CAPITA
• CRITICAL WATER STRESS : ABSOLUTE WATER SCARCITY
• TOTAL WATER FOOTPRINTS; MEANS THE VOLUME OF WATER USED FOR PRODUCTION OF GOODS AND SERVICES
• BY 2025, TWO THRID OF INDIA WILL HAVE LESS THAN 1000 KILO LITERS/ CAPITA/ ANNUM (CRITICAL WATER STRESS; ABSOLUTE WATER SCARCITY)

<table>
<thead>
<tr>
<th>PRODUCE</th>
<th>WORLD AVERAGE (IN LITERS)</th>
<th>INDIA</th>
<th>REMARKS</th>
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<tr>
<td>WHEAT</td>
<td>1620</td>
<td>2014</td>
<td>FRANCE/UK - 590</td>
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<tr>
<td>PULSES</td>
<td>4055</td>
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<td>COTTON -3600</td>
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<td>MILK</td>
<td>1021</td>
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<td>JEAN – 10000</td>
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<td>SHEEP-GOAT</td>
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<td>OUR VIRTUAL EXPORT OF WATER IS 4193</td>
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<td>MEAT</td>
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<td>MILLION/M3/YEAR</td>
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<td>SUGAR</td>
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<td>VEGETABLES</td>
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ADD NEW SUPPLIES TO EXISTING SUPPLIES;

AUGMENT SUPPLY

• RAIN WATER CONSERVATION INCLUDING RAIN WATER HARVESTING

• EFFECTIVE USE OF SURFACE RUN OFF; INCREASE PERMEABILITY, ABSORPTION AND INCREASE BIO-MASS

• IMPROVING GROUND WATER STORAGE; NATURAL AND ARTIFICIAL RECHARGE

• SOIL AND MOISTURE CONSERVATION FOR RAISING LAND PRODUCTIVITY
REDUCING DEMAND: WATER USE EFFICIENCY : WATER PRODUCTIVITY

• NATURAL FARMING: IMPROVE SOIL STRUCTURE, CHOOSE SUITABLE CROP VARIETY AND BETTER AGRICULTURE PRACTISES.
• REDUCE EVO TRANSPERSION: SPECIFIC FORM OF VILLAGE, MULCHING OF SOIL.
• ENSURE EFFICENCY OF SYSTEMS
• ZEOIR WATER FOOT PRINT IN INDUSTRY.
• THERE ARE EMPIRICAL EVIDENCES THAT IN A MINI/MICRO WATER SHED AREA 800 MM OF RAIN IS SUFFICIENT FOR OPTIMUM LAND BASED PRODUCTION
• 8% EXOGENOUS SUPPLY WOULD BE NEEDED- 650 MM
• 35% EXOGENOUS SUPPLY WOULD BE NEEDED- 500 MM
• THUS MANAGING MINI/MICRO WATER SHED AT COMMUNITY LEVEL ENSURES DEMAND MANAGEMENT FOR OPTIMUM PRODUCTION
• WITHIN THE ECO SPACE COMMUNITY CAN MANAGE DEMANDS AND CLAIMS
• TAKE MEASURE FOR ECOLOGICAL RE-GENERATION SO AS TO AUGMENT SUPPLY OF ECO SERVICES
• REDUCING DEPENDANCE ON DEGRADED ECOLOGICAL SERVICES
• ENHANCE PRODUCTIVITY OF LAND AND ANIMALS
• WATER LITERACY; LEARNING WATER BALANCING AND MAXIMISING PRODUCTION PER UNIT OF WATER
• THUS THE CHALLENGES WHICH WE ARE GOING TO FACE
• PROVIDING 150 LITRES/PER DAY/PER PERSON FOR DOMESTIC USE (THE DEMAND WILL DOUBLE IN 2025)
• WATER AVAILABILITY FOR LIVELIHOOD; INCREASE IN LAND BASED PRODUCTION FOR 50% POPULATION
• PROVIDING DOMESTIC WATER FOR INCREASING URBAN AREAS; DEPENDS ON TRANSPORT OF WATER FROM LONG DISTANCES; THUS REDUCING WATER SUPPLY IN OTHER WATER SHEDS FROM WHERE IT IS TRANSPORTED
• INCREASING POLLUTION; THUS MAKING BIG QUANTITY OF WATER UNUSABLE
• RAISING PRODUCTIVITY PER UNIT OF WATER; JUDICIOUS USE OF WATER
• BUILDING/ RE-DESIGNING THE INSTITUTES FOR PROVIDING WATER ON EQUITY BASIS
PLENTY TO SCARCITY AND VICE VERSA

- EXOGENOUS SUPPLY; PRECIOUS WATER; PLENTY SUPPLY LEADING TO HIGH WASTAGE
- IT HAS HIGH COST AND UNAFFORDABLE; IT ALSO DEPRIVES ACCESS TO WATER TO OTHER POPULATION
- SUCH SUPPLY NEEDS BETTER MANAGEMENT OF AVAILABLE WATER AT LOCAL COMMUNITY LEVEL; IT IS EXPANDABLE 3 TIMES IN AREA COVERAGE AND MANY FOLD IN PRODUCTION
ESSENTIALS FOR WATER MANAGEMENT AT COMMUNITY LEVEL

• ENABLING INSTITUTIONAL SUPPORT AND SYSTEM APPROACH FOR GRAM PANCHAYAT/COMMUNITY
• MOBILIZE COMMUNITY, MAKE THEM AWARE, INVOLVE THEMSELVES SO AS TO CONTRIBUTE AND OWN THE SYSTEM FOR ASSURED SERVICES
• FOR MANAGING SATISFACTORY SERVICE LEVEL IF FRAMEWORK OF INCENTIVES FOR PERFORMANCE SO AS TO SUSTAIN THE SYSTEM
• CHOOSING APPROPRIATE TECHNOLOGY AND INSTITUTIONS
• DUAL WATER SUPPLY SYSTEM; INTEGRATE LOCAL WATER SUPPLY SYSTEM INTO PIPELINE SYSTEM
• WOMEN INVOLVEMENT IS CRUCIAL IN MANAGEMENT AND DECISION MAKING BY COMMUNITY
• GRAM SABHA TO REPRESENT COMMUNITIES; DEMANDING REQUIRED SERVICES FROM GRAM PANCHAYAT
• TRANSPARENCY BY APPROPRIATE INTERVENTION, PROCEDURES AND SYSTEMS
• COMMUNITY CONTRIBUTION IS THE KEY FOR INVOLVING COMMUNITY; CONTRIBUTION ENSURES COMMUNITY PARTICIPATION IN PLANNING THE PROJECT AND TO OWN THE SYSTEM; DEVISE AND PAY REGULAR TARIFF FOR O&M
• ENSURE APPROPRIATE O&M SUPPORT AND ACCOMMODATE EXPANSION OF THE SERVICES/ REPLACEMENT/ EXTENSION AND PROVIDE FOR SOURCE FAILURE
• FIXING SERVICE STANDARDS; MoU MAY BE DEVISED BETWEEN GRAM PANCHAYAT AND WATER PROVIDER
Convergence

Govt. dept.

International/national organisations collaboration, sharing resources, sharing knowledge innovations

Facilitation

NGO/Social Mobilisers, information community organisation inter-mediation Building social cohesion conflict resolution, building trust

Village local Bodies Groups and Committees CBO

HONEST
Initiatives for Water Security
- State-wide Drinking Water Grid
- Sujalam Suphalam Yojana
- Spreading channels
- Interlinking of rivers and check dams in rivers
- More than 1,50,000 check dams
- Filling of ponds
• **Sujalam Suphalam Yojana**

10 water scarce districts

- Flood water transfer to water scarce regions – Sujalam Suphalam canal
- Filling of dams from Narmada water – 14 pipelines for 10 dams
- Filling of ponds by Narmada water
- Inter linking of 27 rivers
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<th>Department</th>
<th>Check Dams</th>
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<th>Khet-talavdi</th>
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<td>Rural Development Dept.</td>
<td>36010</td>
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<td>Tribal Development Dept.</td>
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Impact of Recharge on Ground Water Augmentation

Nov-2008

Decadal Variation of Water Level
November 2008 with respect to Decadal Average of November

May-2011

Fluctuation of Water Level
May 2010 to May 2011

Legend:
- >4 m Decline
- 2 to 4 m Decline
- 0 to 2 m Decline
- <2 m Decline
- <2 m Rise
- 2 to 4 m Rise
- >4 m Rise
- Rann & Marsh
Is it:

• A Solution?
• An Alternative?
• A sustainable source?
• A secured supply system?

Certainly Not

Solution lies in

“W R M”

AND

“Water Budgeting”.
Constraints in Developing Water Supply System

Coastal area
Low Yield Area
Over-Exploited Area
Nitrate affected area
Fluoride affected area
Forest area

Saline area
Tribal area
Hydro-geological Aspects of Gujarat

INDEX
- Groundwater with High TDS
- Area with stress on Groundwater
- Alluvial area suitable for Tube wells (High Yield)
- Sandstone area suitable for deep Tube Well (Low Yield)
- Limestone area suitable for dug wells and shallow bores
- Hard Rock area (Basalts, older Metamorphics & Plutonic rocks) suitable for open wells and DTH bore wells (Low Yielding area)
- Saline areas of Kachchh with Isolated Fresh Shallow Water Pockets
General Feasibility of Recharge Structures

Type of Recharge Activity
1. Check Dam
2. SubSurface Check Dam
3. Nala Plugs
4. Percolation Tank
5. Diversion Channel
6. Recharge Tube Well/Well
7. Bore Blasting
8. Hydro-Fracturing
9. Roof Rainwater Harvesting

Legend
- Over-Exloated Area
- Alluvial Area
- Piedmont Zone
- Rocky Area (Tribal)
- Rocky Area (Non Tribal)
- Saline Area
- Shaded areas representing coastal area of the state

Note: Recharge activity is site specific activity hence proposed activity may vary.