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In our endeavour to capture the best practices available in the country and replicate the relevant ones duly customizing to the local needs and situations, the best practices that have already been brought out in the Quarterly Assessment Reports (Q1 and Q2 of 2015-16) are listed here.

1. Transformation of Agricultural Extension using ICT tools – Tamilnadu
2. Green Revolution Company Limited (GGRC) for implementation of Micro Irrigation Scheme – Gujarat
3. Cold Chain Management: Doing It Smarter
4. Initiatives of Industrial Development – Karnataka - Escort officers promote and facilitate investments, and assist investors
5. Gujarat Industrial Extension Bureau – Gujarat
6. Andhra Pradesh Single Desk Portal - Andhra Pradesh
7. Innovation Tracker for Large & Mega Projects - Andhra Pradesh
8. Fodder & Productivity – Andhra Pradesh
9. Fish Farming - Enhancing from incomes in upland areas of Krishna district, AP
10. Dairy Farming - An income enhancing activity in Krishna district, Andhra Pradesh
11. Rythu Kosam - Agricultural Transformation in Andhra Pradesh
12. Hydroponics Green Fodder Cultivation, an alternative to fodder deal with crisis - A Srikakulam district, Andhra Pradesh experience
13. Making Horticulture Profitable - Haryana
14. Breed Development & ICS - Maharashtra
1. BLUE REVOLUTION (SHRIMP CULTURE) IN ANDHRA PRADESH

I. Context

Andhra Pradesh has a long coast line with vast potential to harvest fishery resources to promote rapid development and livelihood opportunities. The AP State stood first in the country in the fisheries sector especially in cultured shrimp production, value and exports. The state has brackish water potential of 1.74 lakh ha. By early 1990s the shrimp culture has risen to the peak. Penaeus monodon (Tiger prawn) was the candidate species and the culture area increased to more than 0.70 lakh ha. However by 1994 the shrimp culture has drastically declined due to the attack of White spot syndrome virus. To protect the interests of farmers and fisherman community the Government has initiated a number measures which contributed to the growth and expansion of shrimp culture in the coastal areas of the state.

II. Objectives

To sustain the shrimp production and exports which contributed to government revenues and livelihood protection of shrimp cultivators and dependent communities.

III. Key Stakeholders

Shrimp farmers, government agencies including the fisheries department, private sector - shrimp processors, exporters, food processing units and consumers - domestic and importers are the key stakeholders.

IV. Implementation Strategy

In 2009, the Government of India has permitted SPF L.vannamei brood stock for hatcheries. Introduction of L.vannamei culture led to the revival of shrimp culture area in the state. Shrimp farmers in Andhra Pradesh have utilised this opportunity to revive their fortunes and quickly adopted this variety. As the P.monodon (Tiger prawn) was affected by white spot virus disease, the shrimp farmers shifted to an exotic variety Specific Pathogen Free (SPF) L.vannamei (Pacific white leg shrimp) duly following the Aquatic Quarantine and bio security measures. Stocking densities are increased which led to increase of productivity to 4 to 6 MT / ha. The culture is also being taken up in fresh water/ low saline waters by acclimatization of the species. This has helped to increase the production by 2 times besides bringing down the rate of incidence of disease.

Good Practices adopted

- The ponds are stocked with the seed produced from SPF brood stock. The ponds are constructed along the creeks and sea water is pumped to the ponds duly following the improved methods.
- The pond bottom was dug in saucer shape to accumulate the sludge.
- The ponds are protected with bio-security measures.
- The feed conversion ratio is maintained between 1:1 to 1:1.5.
- Care is taken by maintaining separate inlet and outlet. Disease is controlled to a major extent and the culture period is reduced to 110-120 days with productivity of 4 to 6 MT / ha which is more than the productivity under P.monodon variety.
- In some areas of Bhimavaram (West Godavari), Amalapuram (East Godavari), the L.vannamei was acclimatized to grow in low saline waters and the incidence of disease is brought under control.
- The water is allowed into the pond through triple filtering nets unlike single filter net.
- The reservoir water pond is maintained separately and from which the water is taken to culture pond.
- The entire culture ponds and area is protected with bio-security measures like crab fencing, bird scare devices, foot and hands sterilisation.
• By stocking SPF seed vertical transmission of the disease is prevented and by maintaining bio-
security, reservoir pond, water filters etc. horizontal transmission of disease is prevented.
• The imported pelleted feed is used in the culture for better growth.
• Check trays are used besides feed spray machines to reduce human contact.
• By random netting disease is checked.
• Better Management Practices are implemented at every stage.
• The quality of seed is pre tested before stocking by Polymerase Chain Reaction (PCR) and purchased
from Authorized Hatcheries permitted by CAA
• Cluster approach and bio security measures are observed
• Disease surveillance is observed by constituting special teams with MPEDA/ NCSA by the department,
• recruitment of multipurpose fisheries extension assistants for field level extension services and
establishment of aqualab services.
• Technology - Toll free number 1800 425 1188 for problems in shrimp culture
• Incentivizing the aquaculture inputs.

V. Resource Utilisation
Apart from Government resources, private sector has put in necessary resources and efforts to make the
strategy a success. In close collaboration with Government of India the state fisheries department has
ensured steady supply of secure seed and feed for the shrimp culture. Extension and research agencies of
both government and private sector have provided necessary technical inputs for rapid expansion of the
area and intensification

VI. Impact/Outcomes
The share of Andhra Pradesh in India’s marine exports has increased from about 20% in 2009-10 to about
40% in 2013-14. During 2009-10, the total value of marine exports from Andhra Pradesh was Rs. 2,100
crores which has increased to Rs. 14,000 crores during the year 2014-15. This can further be boosted by
expanding adoption of Better Management Practices. Some important outcomes are;
• Expansion of shrimp area under fresh water culture.
• Re-use of abandoned shrimp ponds and hatcheries
• Increased productivity from 1T/ha (P.monodon) to 3T/ha (L.vannamei) with less expenditure
• Culture period is reduced from 120-140 days to 100-120 days
• Increased livelihood opportunities in cultivation and processing of shrimp.
• women empowerment
• Increased incomes to farmers
• Increase in exports from the state.

VII. Key Challenges
• The emergence of new diseases and viruses threatening the sustainable cultivation of new variety i.e.
L.vannamei.
• To control pollution of coastal waters.
• Climate change disasters and risk of loss of crop as the cyclones and untimely rains may affect the
production and profitability of the production putting the farmers at risk of huge losses in case of
adversities.
VIII. Replicability and Sustainability

The implementation of best practices like pretested quality seed, bio security measures in culture, cluster approach, formation of disease surveillance teams, multipurpose fisheries extension assistants, toll free number can be adopted as BMPs in potential aquaculture areas of within and outside the state. The culture of shrimp under low saline / fresh water culture is distinguishing feature of Andhra Pradesh which can be emulated by other States for controlling of disease.

SUSTAINABILITY: Simplifying the procedures for registration of farms, ensuring disease free seed supply to farmers, strict compliance with bio security measures, establishment of Aquatic Quarantine Facilities, Brood Stock Multiplication Centres, establishment of Aqualabs are helping the L.vannamei culture in a sustainable manner

IX. Fact Sheet

The brackish water aquaculture is regulated by registering the shrimp farms located in 9 coastal districts through Coastal Aquaculture Authority (CAA) as per CAA Act 2005.

Culture in fresh water is regulated by registering the aquaculture ponds as per the orders issued in may 2015.
3. NEERU-CHETTU(WATER-TREE)

I. Context

Andhra Pradesh was experiencing deficit rainfall during five years in the last decade. Due to climate change factors, prolonged dry spells and frequent floods are expected to be more in future. The state is also facing water crisis due to indiscriminate use of available water (rainfall, surface water, ground water and soil moisture). All these are a result of environmental degradation; and lack of comprehensive adaptive strategy for conservation and regeneration of natural resources. In this context, the state is aiming to become a drought free state in next five years. Giving Water conservation top priority, it is taken up in a mission mode for invigorating growth and development of the State. Neeru-chettu (Water-Tree) is one of the five campaigns taken up by the Government.

II. Objectives

To make the state drought proof in the next five years.

III. Key Stakeholders

Government at various levels including state, district and local (panchayat, municipal) level and local community.

IV. Implementation Strategy/Process

Neeru-Chettu (Water-Tree) is a special campaign under water mission. It promotes activities, in a campaign mode, for water conservation, water management and green cover improvements by involving all stakeholders including government, local bodies and the larger community.

Important activities taken up in a campaign mode and through convergence of resources both government and community and using the technology are --

• Optimum utilization of water for supplementing life saving irrigation and drinking water sources through integrated water resources development and management;
• Bringing all catchments and command areas of the irrigation sources under assured irrigation by rehabilitating them with watershed approach in a demand driven mode;
• Reducing the gap in the ayacut by 50% in the next 5 years by increasing water availability and improving water use efficiency in irrigated areas;
• Treatment of degraded lands and increasing the areas under green cover and density of the existing forests in a systematic manner to achieve “Green Andhra”;
• Increasing the area under production, improvement in productivity and incomes.
• Strengthening the local self Governance institutions; and
• Enhancing the ground water recharge and to keeping the ground water level between 3 and 8 meters.

INNOVATION: Important innovative practices under this programme are:

• A time bound plan is prepared and implemented for ridge to valley treatment of basins. - Working in convergence mode by forest, rural development, irrigation and ground water departments towards implementation of this plan; and by involving people and public representatives.
• Effective water management for better use of conserved water.
• Collaborative efforts by the line departments of Agriculture, Animal husbandry, Horticulture, Fisheries, Rural and Urban Water Supply.
• Ensuring ground water levels in the safe range of 3 to 8 meters in the state through a series of measures which include -
  • Inter-linking of rivers;
  • Water grid: cascade development of tanks;
  • construction of series of check dams; and
  • Panta Sanjeevini. (farm ponds)
THE PROCESS:

• Avagahana Sadassulu (awareness meetings) on “NEERU – CHETTU” have been taken up in all the villages by deploying special teams to create awareness.

• Five year perspective plans are developed for water conservation, Water Management and Plantations in convergence with all the departments. The detailed action plans on water conservation and soil moisture conservation are being taken up in all villages.

• Responsibility at higher level - the Chief Engineer and Superintending Engineers of irrigation department will execute major water harvesting structures as per action plan.

• Ground water budgeting was taken up by the Ground water department; and information collected is disseminated at village level for planning, identification of rain water harvesting structures and prepare conjunctive water use plans under major, minor and medium irrigation sources.

• People’s participation – identification of suitable areas for taking up plantation by people in Gramasabhas/ward committee meetings.

• Accountability – designated functionaries from each department for “NEERU – CHETTU” at different levels for execution of planned interventions as per approved plans.

• Close monitoring and reviews - daily reporting by the field officers; and fortnightly reviews by state level nodal officer in co-ordination with other state level officers.

• Convergence of resources available under state plan schemes of GOAP viz., MGNREGS, IWMP, RRR, AIBP, World Bank, JICA, MIDH, NMSA and 14th Finance commission for implementation of the activities.

Technology use - dedicated database management system for data generation and using IGIS, remote sensing and MIS applications

V. Resource Utilisation

Through convergence, resources are utilised effectively and efficiently. People’s participation is given due place and their contributions both labour and physical are actively encouraged to promote spirit of community participation and community ownership.

VI. Impact

Large scale social and economic benefits are expected through drought mitigation and reducing dry spells and bridging the deficit in the ayacut in Major, Medium and Minor Irrigation projects.

Substantial improvement of ground water levels in over exploited areas of the state is expected.

Very good improvement in Ground Water levels in Rayalaseema region was noticed due to the works taken up under Neeru–Chettu.

Real time ground water monitoring being done in 1254 piezometers in the state from Jan’2016.

Other benefits expected in the long run are:

• Accomplishing the target of 33% of forest cover against the current forest cover of 25% to overcome environmental pollution and also to combat adverse consequences of future climate change.

• De-silting 15.37 Crore cum of tanks contributing to increase in impounding capacity of tanks to the tune of 5.366 TMC.
• Construction of water harvesting structures, Soil Moisture conservation works (SMC), construction and repair to check dams/ percolation tanks, and farm ponds. Due to Water Harvesting Structures additional capacity of 6.094 TMC created.
• Due to linking of chain of tanks runoff water is better utilized by feeding surplus from one tank to another tank.
• Due to digging of Pantasanjeevini (Farm ponds) the stored water can be utilized for dry spell mitigation, life saving irrigation, dry land horticulture and spraying pesticides

VII. Key Challenges
• Average rainfall and its even distribution
• Continued and active participation of the local communities

VIII. Replicability and Sustainability
The programme is replicable and is necessary in every state to meet the challenges of climate change.

Sustainability: NEERU-CHETTU programme is a movement for sustainable development of resources. Proper commitment of leadership and community will ensure its sustainability. Sustainable water system through water conservation and water management. Community, officials and public representatives continuous engagement bring about enduring benefits.

IX. Fact Sheet

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<th>Salient Features</th>
<th>Details</th>
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<tr>
<td>Minor Irrigation works</td>
<td>The desilting of tanks was taken up to improve the storage capacity and to stabilize the Ayacut. The repairs and renovation of existing water harvesting structures and construction of new structures such as check dams, percolation tanks and farm ponds have been taken up for increasing the ground water recharge. Soil moisture conservation is also taken up on large scale under MGNREGS and Neeru-Chettu.</td>
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<td>Interlinking of Rivers</td>
<td>Government is seriously contemplating inter and intra linking of rivers to transfer surplus water to deficit basins. Through interlinking it is proposed to utilize 150 to 200 TMC of water and there by bridging a gap Ayacut of 15 Lakh acres and creating new Ayacut of 14 Lakh acres in drought prone areas of Rayalaseema Region, Nellore and Prakasam districts. Interlinking and intra linking of rivers from surplus to deficit basins is a major drought proofing measure in the state under Neeru – Chettu. Inter linking of rivers also helps in ground water recharge in the state. It is envisaged to keep ground water levels in the safe range of 3 – 8 Mts in the state to avoid environmental imbalance and also to save energy for pumping ground water.</td>
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<tr>
<td>Smart Water Grid:</td>
<td>Smart Water Grids will be created similar to electric power grids to supply water to needy areas by transfer of water from water surplus basins to water deficit basins and filling up of tanks from major assured sources.</td>
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<tr>
<td>Cascade Development</td>
<td>Number of cascades will be developed in all the basins of the state by interlinking all the tanks within the cascade. Interlinking of cascades will be taken up by identifying the links between tanks and cascades.</td>
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<tr>
<td>Series of Check Dams</td>
<td>Series of Check Dams and sub surface dams at suitable locations will be constructed on all minor rivers and streams to recharge ground water.</td>
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<tr>
<td>PantaSanjeevini (FarmPonds)</td>
<td>A massive programme for digging of Farm ponds Under Panta Sanjivini will be taken up with sizes of 5 X 5 X 2, 8 X 8 X 2 and 10 X 10 X 2 Mts. he farm ponds will recharge the ground water and also used for supplementation during water scarcity.</td>
</tr>
<tr>
<td>Dry spell Mitigation</td>
<td>By using Rain guns life saving Irrigation will be provided by collecting water from nearby water source and to supplement water to the distressed Ayacut during dry spells.</td>
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6. REAL TIME MONITORING AND INTEGRATION OF GROUND WATER LEVELS

I. The Context

The AP government has initiated water conservation and water management activities in a mission mode under Neeru-Chettu (Water-Tree) programme. This programme has several dimensions like Inter linking of rivers, transfer of water from surplus to deficit basins, de-silting of tanks, repairs and renovation of water harvesting structures, plantation of trees and Micro-Irrigation projects. The main idea is to increase the groundwater recharge, provide required water for agriculture and allied activities and finally achieve the drought free status for the state. To track the impact of these initiatives on ground water levels, the Hon’ble Chief Minister desired that the Ground Water Department collect real time data on groundwater levels and integrate with rainfall and other water sources in the state.

II. Objectives

- The objective is to measure the water availability on real time basis with a purpose to manage its efficient utilisation.
- Effective use of Technology for sustainable development of this valuable resource and improving water use efficiency in all its uses including agriculture which is a major consumer of water.

III. Key Stakeholders

Key stakeholders are people who are the final consumers and government which has to play a critical role in this effort. Other major sectoral stakeholders include farmers, industrial users.

IV. Implementation Strategy

There are huge challenges in real time data collection particularly in manual data collection, which include, human errors, chances of missing data on the important events like high rainfall, severe droughts etc. Hence it was decided to use technology in a big way to overcome the challenges and collect real time data seamlessly.

The advantages with real time data on groundwater levels are:

a. The data can be integrated with rainfall, canal releases for a better management of water resources;

b. Helps in planning and implementing water conservation structures as per need;

c. Useful in planning the cropping systems based on the resource availability

d. Useful in implementation of Micro-Irrigation projects

The following technical instruments are being used in the data collection.

- Installed Digital Water Level Recorders (DWLRs) with Telemetry system in 1254 Piezometers covering all 736 groundwater basins (a micro-hydrological unit), all geological formations in 13 districts.
- Installed 130 Electrical Conductivity Sensors for water quality monitoring in the existing piezometers

Innovation: Real time and reliable information through instrumentation and automation

V. Resource Utilisation

Necessary funding from the government and technical resources by training the existing staff in the departments of planning and groundwater and remote sensing.

VI. Impact

Following benefits and impact is expected from this initiative of real time basis availability of the soil moisture, rainfall, surface water and groundwater levels:

- Availability of record of the water level trends at user defined micro intervals
• Helpful in assessing the groundwater resource dynamically and prepare plans for crop management.
• Helps in better planning for crop type, and assessment of water requirement at different levels can be assessed and management of the water very accurately and efficiently.
• Based on the resource status, type, dimensions of artificial recharge structures can be planned optimally.
• Planning alternative arrangements for drinking as well as agriculture purpose in case of drought situation.
    This may include planning for transportation of required quantity from surplus areas for life saving irrigation and supply of water for drinking needs.
    Management of groundwater levels at desired levels will be possible i.e., between 3 to 8 meters below ground level.
    • If the water levels are above 3 meters, it leads to water logging conditions and resulted in land deterioration, decrease in production and productivity.
    • If the water levels are below 8 meters there will be many environmental problems and consumption of energy for lifting will increase manifold.

VII. Key Challenges
• establishing the technical network and making it operational
• Training of staff and providing their logistic support is another challenge.
With establishment of network and use of technology the constraints and challenges can be overcome. AP has the expertise and skilled staff available for the task.

VIII. Replicability and Sustainability
Project can be replicated in all over India and in fact will be very useful for emulation in natural resources management.
Sustainability: Near-real time inputs for effective water management are essential for efficient management valuable resource like water. Hence government has to continue this activity as part of development efforts.
Ensuring the participation of communities and other stakeholders like private sector, environmental activists in this effort will broaden the scope of this activity and makes it sustainable in the long run. Information generated from this programme will also contribute to effective decision making and sustainable use of natural resources.
7. 24X7 POWER SUPPLY

I. The Context

Andhra Pradesh is one of the pioneering states in the country to initiate the power sector reform as early as 1998. Various reform initiatives were taken up during the period 1998-2004, which resulted in bringing down energy deficit to 1.5% as compared to all India energy deficits of 7.1% during FY 2003-04. Since 2004, the performance of the power sector in Andhra Pradesh did not keep pace with the developments in other sectors resulting in increased energy deficit of 17.6% in 2013. The state has been witnessing a 15% increase in the demand each successive year. Due to restrictions on gas utilisation and low water levels in reservoirs caused sharp declines in power generation causing unprecedented crisis. Added to this agricultural consumption has increased manifold due to low ground water levels.

Power Sector is a critical infrastructure input required for the smooth functioning of the levers of the economy. Efficient and economical supply of 24X7 power helps in efficient industrial operations and overall development of the state. Hence uninterrupted power supply of 24x7 is the need of the hour.

II. Objectives

- Ensuring efficient and uninterrupted supply of quality power to all categories of consumers at economical cost.

III. Key Stakeholders

Key stakeholders in this area are government, general public, sectoral consumers like agriculture, industry, services sectors.

IV. Implementation Strategy

The per capita energy consumption is continuously rising in the state while generation, capacity addition and demand-supply management are unable to match the requirements due to delayed investments, gestation period gaps, unmatched transmission projects execution and other exogenous factors. AP has focussed only on supply side management in the power resource planning until 2014 due to which marginal power purchase costs increased each successive year significantly. These factors compelled AP power utilities to impose power cuts in the range of 4-6 hrs in urban areas and almost 12 hrs in rural areas.

Hence, AP has evaluated its strategy of Demand-Supply planning and included Demand side management practices, efficient loss reduction techniques, consumer initiatives and off-grid inexpensive power generation solutions to reduce losses and high power purchase costs.

Andhra Pradesh followed demand side and supply side management strategies simultaneously to meet the increasing demand for energy consumption. AP planned overall power supply improvement by undertaking measures such as energy mix optimization, increasing the power generators operational efficiency, optimal fuel procurement costs. Plans were made to electrify all un-electrified households by 2017 with 7 hrs day time quality power supply to Agricultural consumers from off-grid and grid-connected solar pump set schemes.

Innovation: Andhra Pradesh leadership has set a goal to give 24X7 quality, reliable, affordable and continuous power supply to all consumers (except agriculture consumers) and 9 hrs supply to Agriculture consumers. In order to achieve this, AP has focused on the following initiatives in addition to prevailing capacity addition and strengthening & augmentation of power network planning.

- **Demand Side Management through Energy Efficient initiatives**
  - Off-Grid power consumption initiatives like solar pump sets, solar rooftops, decentralised distributed generation in rural and tribal areas where grid extension is not feasible.
- **Loss reduction initiative** - These include High Voltage Distribution System (HVDS) throughout the state, 100% metering of feeders and DTRs, feeder segregation etc.,
- **Energy efficiency** - In addition to power procurement and network resource planning, AP incorporated energy efficient measures such as Energy efficient pump set program, LED bulb distribution to domestic...
consumers, replacement of conventional street lights with LED lights with an estimated energy savings of 6845 MUs per annum, solar rooftop and solar pump set schemes in its resource planning to reduce the demand-Supply gap.

- HVDS project is planned under 24X7 to reconfigure the existing Low voltage (LT) network as High Voltage Distribution System, wherein the 11kV line is taken as near to the loads as possible and the LT power supply is fed by providing appropriate capacity transformer and minimum length of LT line.
- Consumer and IT initiatives like IVRS, toll free number, feeder monitoring, mobile alerts were incorporated in the 24X7 power supply strategy to achieve consumer satisfaction and reliable continuous power supply.
- Renewable Energy initiatives like Solar Parks, Green energy corridor, JNNSM solar addition, rooftop solar, Wind capacity addition and solar pump set scheme, etc., were planned to tap renewable power in the state to meet the growing demand for power in environmentally sustainable manner by developing Solar Parks.

V. Resource Utilisation

The state has utilised all opportunities and resources for ensuring capacity addition and utilising existing and unutilised capacity. Resources have been mobilised from Government of India, from within the state, private sector and international sources for improving the energy scenario in the state.

VI. Impact

The state is already reaching self-sufficiency in power generation and planning to generate surplus power to attract industry and investments. Successful implementation of 24X7 Power supply shall make the state attractive to do business and contribute to the rapid economic and social development of the state.

VII. Key Challenges

- Attracting additional investments as the state has meagre resources to invest after bifurcation.
- Improving the efficiency of transmission and distribution losses.
- Bringing down the cost of production, which has far reaching implications for the industrialisation of the state.

VIII. Replicability and Sustainability

The innovative practices adopted by the states which are outlined above are replicable and followed by other states.

Sustainability: Power consumption increases continuously with the acceleration in development. Hence, continuous implementation and review of demand side and supply side strategies improves the performance of the utilities and helps in supply of quality, reliable and affordable power to all consumers for a long period of time. These practices are universally applicable and sustainable.