The role of Gujarat Green Revolution Company Ltd. in building resilience among the farmer through adoption of Smart Agricultural Technology in the light of climate change to sustain the food security

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The role of **Gujarat Green Revolution Company Ltd.** in building resilience among the farmer through adoption of Smart Agricultural Technology in the light of climate change to sustain the food security

14th October.-2016, AAU-Anand

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Joint Managing Director

**Gujarat Green Revolution Company Ltd.**

P.O. Fertilizernagar, Dist. Vadodara (Gujarat)
Climate Smart Agriculture

- Climate-smart agriculture, forestry and fisheries (CSA), as defined and presented by FAO at the Hague Conference on Agriculture, Food Security and Climate Change in 2010, contributes to the achievement of sustainable development goals. It integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges. It is composed of three main pillars:
  - sustainably increasing agricultural productivity and incomes;
  - adapting and building resilience to climate change;
  - reducing and/or removing greenhouse gas emissions, where possible.
• CSA is an approach - investment conditions to achieve sustainable agricultural development for food security under climate change.

• To ensure comprehensive integration of these effects into national agricultural planning, investments and programs.

• The CSA approach sustainable agricultural development within the explicit parameters of climate change.
Need for Good practice to be followed by State

- State effectiveness is vital to democratic transition and consolidation.
- Today’s challenges is a systemic crisis in accountability and effectiveness of governance.
- Create opportunities to equip leaders and managers with the knowledge, skills and tools to create inclusive policies and accountable institutions.
- Where state infrastructural power is deficient, efforts must be made to build essential state institutions and capabilities.
- “state-building” is often vaguely defined as a process in which the state accumulates power. But it should be accumulating only infrastructural power, not despotic power.
Six Most Critical Functional capacity of an Effective State

- The capacity to monopolize the legitimate use of violence (coercive capacity)
- The capacity to extract resources (extractive capacity)
- The capacity to shape national identity (assimilative capacity)
- The capacity to regulate the society and economy (regulatory capacity)
- The capacity to maintain internal coherence of state institutions (amalgamating capacity)
- The capacity to distribute resources (redistributive capacity) - GGRC

* Pye 1966; Binder et al 1971; Grew 1978
Reason for Gujarat State Intervention in MIS Scheme

- Subsidy for Micro Irrigation System (MIS) was available under different schemes and sub-schemes.

- Varying subsidy assistance norms and implemented by multiple Govt. Depts. creating confusion among farmers.

- No integrated approach, it was in piecemeal.
- Confusion among the farmers at ground level.
- Taking a long time to disperse the subsidy.
- Progress of MIS was very minimal.

- The Government wanted to put all efforts into an integrated approach in uniform manner to remove anomalies.

- Integrate all available funds in one head to utilize efficiently and extend benefits to more and more farmers of the State.
State Intervention led to: Formation of GGRC in Vibrant Gujarat 2005, announced by the Hon’able CM of Gujarat

GNFC

GSFC

GAIC

GAPC

Govt. of Gujarat

Gujarat Green Revolution Company Limited

Equity 46%

Equity 46%

Equity 8%
Major Intervention by State Government

1. Strong and focused Political will – Intervention in place of Interference
2. Single window approach for implementing Scheme for entire State.
3. Transferring Governance from Government mode to Corporate mode.
4. Intervention through major policy decision by issuing a unique GR compare to other States.
5. MIS considered as mode of Irrigation.
6. Change in Department from Agriculture to Irrigation Department.
7. Delegation of authority and responsibility for implementation of the Social Sector Scheme-MI to a Corporate body.

8. GGRC with relatively higher autonomy in its functioning and decision making.

9. Highest Level of priority to the Scheme: as per the State need and problems.

10. Well thought business model to implement socio-economic Scheme.
Contd.....

11. First PPP Model in implementing Socio-economic Scheme in the Country.
12. Reposed faith in third party inspection agencies to get the work done report (major deviation from the routine Government monitoring system)
13. Multi stage monitoring and control system (Field & Technical Inspection)
14. Introducing principle of FIFO i.e. equal opportunity to get the benefit of the Scheme
15. Linked the Scheme to operate by market forces.
16. Placing a uniform mode for the implementing the Scheme for the entire State (Price as well as MIS Suppliers).
17. Giving freedom to Agency to use latest IT in its implementation procedure.
18. **Transparency**- At every stages of application processing
Best practices followed by GGRC

A unique GR was issued by the GoG in 2005 different from other States, wherein any farmer can go for

- Any area; Any crop; Any type of Micro Irrigation System
- Choice of MIS Supplier

Other features
- Electricity connection on overriding priority.
- No subsidy ceiling

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of Farmer</th>
<th>Non Dark Zone area</th>
<th>Dark Zone area for 57 talukas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Farmer: (Land holders of more than 2 hectares)</td>
<td>Up to 50% of MIS Unit Cost or Rs. 60,000/- per hectares, whichever is less</td>
<td>Up to 60% of MIS Unit Cost or Rs. 60,000/- per hectares, whichever is less</td>
</tr>
<tr>
<td>2</td>
<td>General Farmer: Small and Marginal farmer (Landholders of less than 2 hectares)</td>
<td>Up to 60% of MIS Unit Cost or Rs. 70,000/- per hectares, whichever is less</td>
<td>Up to 70% of MIS Unit Cost or Rs. 70,000/- per hectares, whichever is less</td>
</tr>
<tr>
<td>3</td>
<td>SC/ST Farmers</td>
<td>Up to 75% of MIS Unit Cost or Rs. 90,000/- per hectares, whichever is less</td>
<td>Up to 85% of MIS Unit Cost or Rs. 90,000/- per hectares, whichever is less</td>
</tr>
</tbody>
</table>
Gujarat Model

Business based Approach

- Decides to adopt MIS and Chooses MIS Supplier
- MIS Supplier Does field Survey and Prepare Design and Cost estimate of MIS as per GGRC approved rates

- Farmer approves design & Signs on all relevant documents for online submission to GGRC
- GGRC Process the file online as well as physical, issue work order, verify the installed MIS and disburse the subsidy

✓ Beneficiary treated as a Customer
✓ Subsidy treated as an Investment.
Gujarat Model of Application Processing at GGRC

- Agronomical & SMS Services
- Insurance Coverage to MIS

Submission of Verification & Trial Run Report Along with Subsidy Release Form for Final Payment

QR Code/GPS based Mobile Application for MIS Installation Verification

Installation of System & Verification by Third Party

Reconciliation of Farmer’s Share & Advance Payment to MIS Supplier

Registration of MI Application with Geo-Tagging & Issuance of work order

Submission of Signed TPA & Deposition of Farmers Share
As per Cl. No. 18.0 of PMKSY Guideline
Geo-fencing based Design and Cost estimate Preparation

Use of Geo points (Lat – Long) on Google Map / Bhuvan Map to get real size and shape of the field for preparing design and cost estimate.

Transferring Geo-points as per the shape and size of the field to AUTOCAD for preparing Irrigation System Design
Use of QR Code in Geo-tagging for verification and Monitoring of installation of MIS

☑ Third Party Inspection is conducted on every farmers Micro Irrigation System installed on his field by using QR (Quick Response) code System with Geo locations.
GPS based Monitoring & Evaluation
Major IT Intervention for speedy and accurate processing

- Incorporation of Barcode System
- Biometric System

[Images of barcode scanner, thumb/fingerprint scanner, webcam, and digital signature pad]
A New Initiative of Showing Schematic Diagram through picture to farmer

✔ Farmer can understand what MI Component he will be provided by the MIS Supplier and at the time of verification he will count quantity of MI Components comparing with the images provided to them.

- Drip Irrigation System with One Filter
- Mini Spr. Irrigation System
- Drip Irrigation System
  Two filters (Hydrocy. F + Disc Filter)
Online Compact File Storage System
Scientific way of file Management

File Colour Code System

DIS File 2015
SIS File 2015
DIS File 2014
SIS File 2014
Solar File 2015
Unique Features responsible for Success of GGRC Model

I. Simple and Flexible in its Approach
II. Transparency in its Approach
III. Effective Quality Monitoring and Assurance System
IV. Use of IT based application to prepare cost and design and to monitor the installed MIS
V. Basket of Services
VI. Implementation cost for the Government is nil.
Result of State Effectiveness

Before establishment of GGRC

- The achievement under MIS Scheme was 2.26 lakh hectares with approximate 1.41 lakh beneficiary farmers (From 1991 to 2005).

- Average Annual Achievement was 15,000 ha./year

After establishment of GGRC

- The achievement under MIS Scheme is 13,93,246 hectares with 8,67,172 beneficiary farmers (From 2005 to Sept-2016)

- Average Annual Achievement is 1.21 lakh ha./year

- Gujarat ranking continuously first since last four years in terms of bringing area under Micro irrigation per annum among various States of India.
Major crop wise area covered under MIS(Ha) (From 2005 to March-2016)

Total area covered under Hort. Crops: 1,77,854 Ha

Total area covered under Agri. Crops: 11,30,289 Ha
Over all Farmers category wise (based on holding size) no. of farmers and area covered from 2005-06 to 2015-16

Classification of Farmers on the basis of land holding in the state

- **Marginal Farmer** (up to 1 Ha) 5%
- **Small Farmer** (>1 to ≤ 2 Ha) 16%
- **Medium Farmer** (>2 to ≤ to 10 Ha) 65%
- **Large Farmer** (More than 10 Ha) 14%

Small and Marginal no. of farmers : 38% adoption
Small and Marginal farmers covered area (Ha) : 25%
Concurrent Monitoring and Evaluation of the MI Scheme

- **Cabinet Sub-Committee** on Micro Irrigation meets at least twice in a year, to review performance and deliberate on policy initiatives and implementation imperatives to improve implementation of the Scheme.

- As per the report of Concurrent Evaluation of the Scheme submitted by the AFC India Limited (earlier Agricultural Finance Corporation - GoI): Findings contained in the AFC report

<table>
<thead>
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<th>Sr. No.</th>
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<th>Result (%)</th>
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<tr>
<td>1</td>
<td>Saving in Water</td>
<td>20-48 %</td>
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<tr>
<td>2</td>
<td>Saving in Electricity Cost</td>
<td>10-17%</td>
</tr>
<tr>
<td>3</td>
<td>Saving in Labour Cost</td>
<td>30-40%</td>
</tr>
<tr>
<td>4</td>
<td>Saving in Fertilizers</td>
<td>11-19%</td>
</tr>
<tr>
<td>5</td>
<td>Increase in Crop Yield</td>
<td>20-38%</td>
</tr>
<tr>
<td>6</td>
<td>Increase in net return / ha due to micro irrigation (Based on annualized cost)</td>
<td>Rs. 17000/-</td>
</tr>
</tbody>
</table>

Based on the above findings, the **pay back period** for the beneficiary farmers and for the Government has been estimated at **2 cropping seasons**.
Additional Income to Farmer due to Major State Intervention in MI Scheme

Considering per hectar average additional income of Rs.17000/-. 

Considering the area covered under micro irrigation during the period 2005-06 to 2015-16; now onwards there will be increase of annual income of 8473 crore among the farmers adopted MIS.

Considering 100% MI System is in use by the farmers who have adopted MIS within last 5 years, and 60% is in use by the farmers who have adopted MI System before 5 years back.

Major contributor for the Agricultural Growth (avg. more than 10%).
Awards and Recognition

✓ Awarded for the Best Innovation work in the field of Agriculture Development by Federation of Gujarat Industries (FGI) during September – 2016.
✓ Awarded with Trend Setter Award by Gujarat Innovative Society during April - 2015
✓ Nominated and shortlisted for the United Nations Public Service Award during Nov-2014
✓ Nominated for Prime Minister’s Award for Excellence in Public Administration during the year 2014-15
✓ Nominated for E-Governance Award in the category Government to Citizen Project of the Year during 2014-15
✓ Paper on “Micro Irrigation for Higher Productivity” was published and presented during FAI Annual Seminar 2014.
Awards and Recognition

✓ Paper on “Ensuring Food Security through Adopting Smart Agricultural Technology in the light of Climate Change by GGRC in Gujarat, India” was accepted and published in the DNC Conference, - 2015, Dresdan, Germany.

✓ Presentation on “Micro Irrigation in Gujarat: A Case Study of State Effectiveness” has been presented at Anand during Indian Economic Policy Strategy conference, Jan-2015 and published on you-tube by National Institute of Public Finance & Policy-DEA, Min. of Finance, Delhi.

✓ Presentation on “Gujarat State Experience in implementation of the Micro Irrigation Scheme was made during the workshop on “Micro Irrigation – The Way Forward” organized by Dept. of Agriculture, GoK at Bangalore.
Still, a lot to be done to realise "Taakat Ek Boond Ki"

To achieve More Crop per Drop as per our Hon’able PM’s vision to achieve more State Effectiveness
Thank you!
QR Code Scanning
This screen is shown after the QR CODE is scanned. It includes the Farm profile i.e. general information regarding the registration no, farmer, supplier and location of the farm.
This screen lists all items from the Mat Group – Head.

Functions:
- Search Item
- Check all “OK”
Lastly, the user can upload one or more photographs of:

- Farmer
- Unit
- Supplier
GREM APP

User can choose to Submit Now or Save and Submit Later.
INCOMPLETE INSPECTIONS

This screen shows all the incomplete inspections. The user can simply go to edit and resume the testing from where they left.

PAST INSPECTIONS

This screen shows a list of all the past inspections completed by an inspector.
Verification by Engineers at GGRC through Google Map

<table>
<thead>
<tr>
<th>ID</th>
<th>Regno</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Images</th>
<th>IMGLocation</th>
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<td>View Map</td>
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<td>73.346907777676</td>
<td><img src="image8.png" alt="Image" /></td>
<td>View Map</td>
</tr>
</tbody>
</table>
Verification by Engineers at GGRC through Google Map
Best Practices at GGRC

-As identified by NABCONS

Self Sustaining Set-Up

- Profit generation while implementing Government schemes.
- No dependence on State Government for maintenance
- Basis for complete autonomy in decision making including staffing

Effective use of Information Technology

- Effective integration of Project Management, Financial Management, and Management Information System MIS.
- Integrity of data is very high
- On-line access to beneficiaries and other stakeholders
- Lean and thin support staff required for sustaining operations – very low administrative and transaction costs
- Dedicated – Interactive Website
Effective Checks and Balances

- Zero level misutilization of subsidy funds
- Third Party Inspection
- Audit of Third Party
- Structured Surveillance by GGRC
- Standalone Monitoring and Evaluation Consultant for yearly field monitoring study.

Innovative package

- Insurance of equipment and beneficiary
- Agronomical Support Services in post-implementation period
- Hand-holding for bank finance.
In revision of unit cost of MI Systems the GGRC considers cost escalation in cost of MI components, secondary transportation and Installation Expenses (Skilled and unskilled manpower cost) separately.

The revised unit cost is the sum of the revised unit cost of materials used, components used, secondary transportation and installation expenses. The methodology is made known to stakeholders.

Water Storage Sump has also been incorporated in the Scheme.

- **Involvement of NGOs in Tribal Areas**
- **Exclusive Training Programmes for Tribal Youth**
  - Training in MIS Installation and Maintenance
• **Inclusion of MIS in SSNNL canal command area as Pilot Project – Convergence with major irrigation scheme**

• **Dovetailing of Tribal Development Funds and MIS Scheme with the Provision of discriminatory subsidy up to 75 %**

• **Digitalization of MIS beneficiary files and records underway**

• Subsidy based on actual unit cost – support for balance difference between actual cost and CSS subsidy

• **Preferential Power Connections to Farmers**
  
   ➢ The GoG have envisaged innovative schemes for providing preferential power connection to those farmers who have installed MI Systems through GGRCL.

   ➢ These Schemes are named GUVNL – 2000, GUVNL – Tribal Area, GUVNL PDC/RC
## District wise area covered against Irrigated area (up to March-2016)

<table>
<thead>
<tr>
<th>District</th>
<th>Area in Hectare</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banaskantha</td>
<td>377136</td>
<td>(69%)</td>
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<tr>
<td></td>
<td>261136</td>
<td>(104%)</td>
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<tr>
<td>Junagadh</td>
<td>99738</td>
<td>(44%)</td>
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<tr>
<td>Rajkot</td>
<td>103405</td>
<td>(79%)</td>
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<tr>
<td>Amreli</td>
<td>84619</td>
<td>(45%)</td>
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<tr>
<td>Sabarkantha</td>
<td>159541</td>
<td>(58%)</td>
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<td>Bhavnagar</td>
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<td>Surendranagar</td>
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<td>(66%)</td>
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<td>Jamnagar</td>
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<tr>
<td></td>
<td>49898</td>
<td>(42%)</td>
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<tr>
<td></td>
<td>80634</td>
<td>(87%)</td>
</tr>
<tr>
<td></td>
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<td>(87%)</td>
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</table>

Source: Department of Agri. Cooperation website
District wise area covered against Irrigated area (up to March-2016)

Area in Hectare

Source: Department of Agri. Cooperation website
## District wise area covered against Irrigated area (up to March-2016)

<table>
<thead>
<tr>
<th>District</th>
<th>Area in Hectare</th>
<th>% Coverage</th>
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<td>Gandhinagar</td>
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<td>Panchmahal</td>
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<td>Dangs</td>
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<td>Anand</td>
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<tr>
<td>Mahisagar</td>
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<td>(25%)</td>
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</tbody>
</table>

Source: Department of Agri. Cooperation website
## District wise area covered against Irrigated area (up to March-2016)

<table>
<thead>
<tr>
<th>District</th>
<th>Total Irrigated Area (Ha) *</th>
<th>Area (Ha.)</th>
<th>% irrigated area covered</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Drip</td>
<td>Sprinkler</td>
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*Area in Hectare

Source: Department of Agri. Cooperation website
## District wise area covered against Irrigated area
*(up to March-2016)*

<table>
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<tr>
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<td>8666</td>
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</table>

*Source: Department of Agri. Cooperation website*
## District wise area covered against Irrigated area
(up to March-2016)

<table>
<thead>
<tr>
<th>District</th>
<th>Total Irrigated Area (Ha) *</th>
<th>Area (Ha.)</th>
<th>% irrigated area covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gandhinagar</td>
<td>111877</td>
<td>8972</td>
<td>2940</td>
</tr>
<tr>
<td>Panchmahal</td>
<td>37124</td>
<td>1955</td>
<td>8705</td>
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<td>Dangs</td>
<td>179</td>
<td>111</td>
<td>5036</td>
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<tr>
<td>Anand</td>
<td>165596</td>
<td>3805</td>
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<td>Arvalli</td>
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<td>40690</td>
<td>16514</td>
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<tr>
<td>Chhotaudepur</td>
<td>49537</td>
<td>8958</td>
<td>36664</td>
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<tr>
<td>Gir Somnath</td>
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<td>26003</td>
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<tr>
<td>Botad</td>
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<td>D. Dwarka</td>
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<td>5932</td>
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<td>Morbi</td>
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<tr>
<td>Mahisagar</td>
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<td>7308</td>
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<td><strong>Total</strong></td>
<td><strong>3173978</strong></td>
<td><strong>640660</strong></td>
<td><strong>667483</strong></td>
</tr>
</tbody>
</table>

Source: Department of Agri. Cooperation website