



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

Publication History

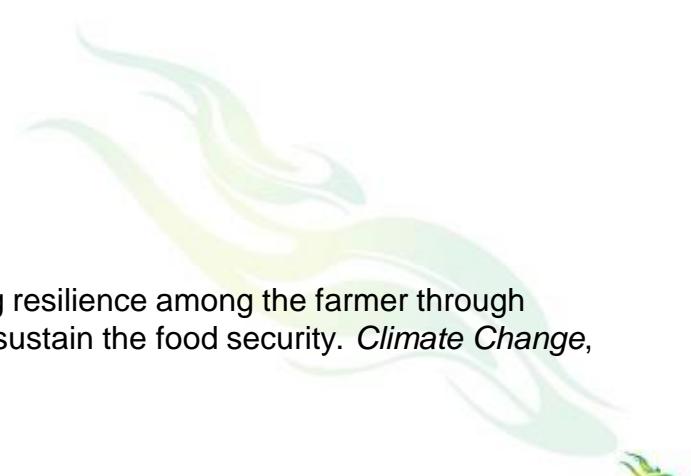
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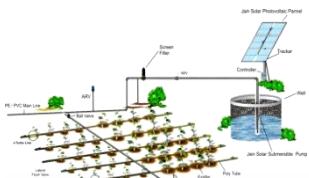
Sugoor RK. The role of Gujarat Green Revolution Company Ltd. in building resilience among the farmer through adoption of Smart Agricultural Technology in the light of climate change to sustain the food security. *Climate Change*, 2017, 3(9), 441-490





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



R K Sugoor, IFS
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 gases emissions, where possible.



Cont...



What is CSA?



- 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



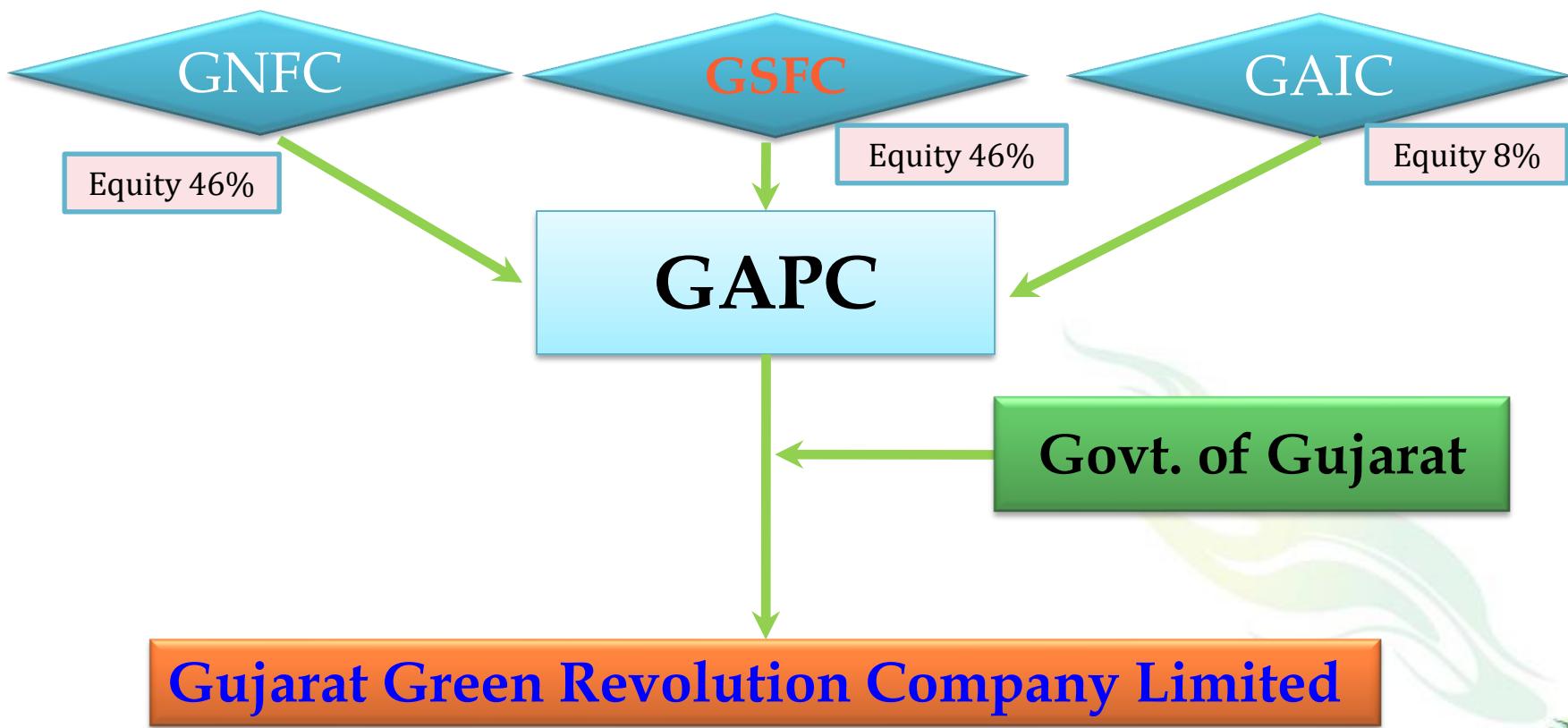
Reason for Gujarat State Intervention in MIS Scheme



- 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



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.



Contd.....



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



Contd.....



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

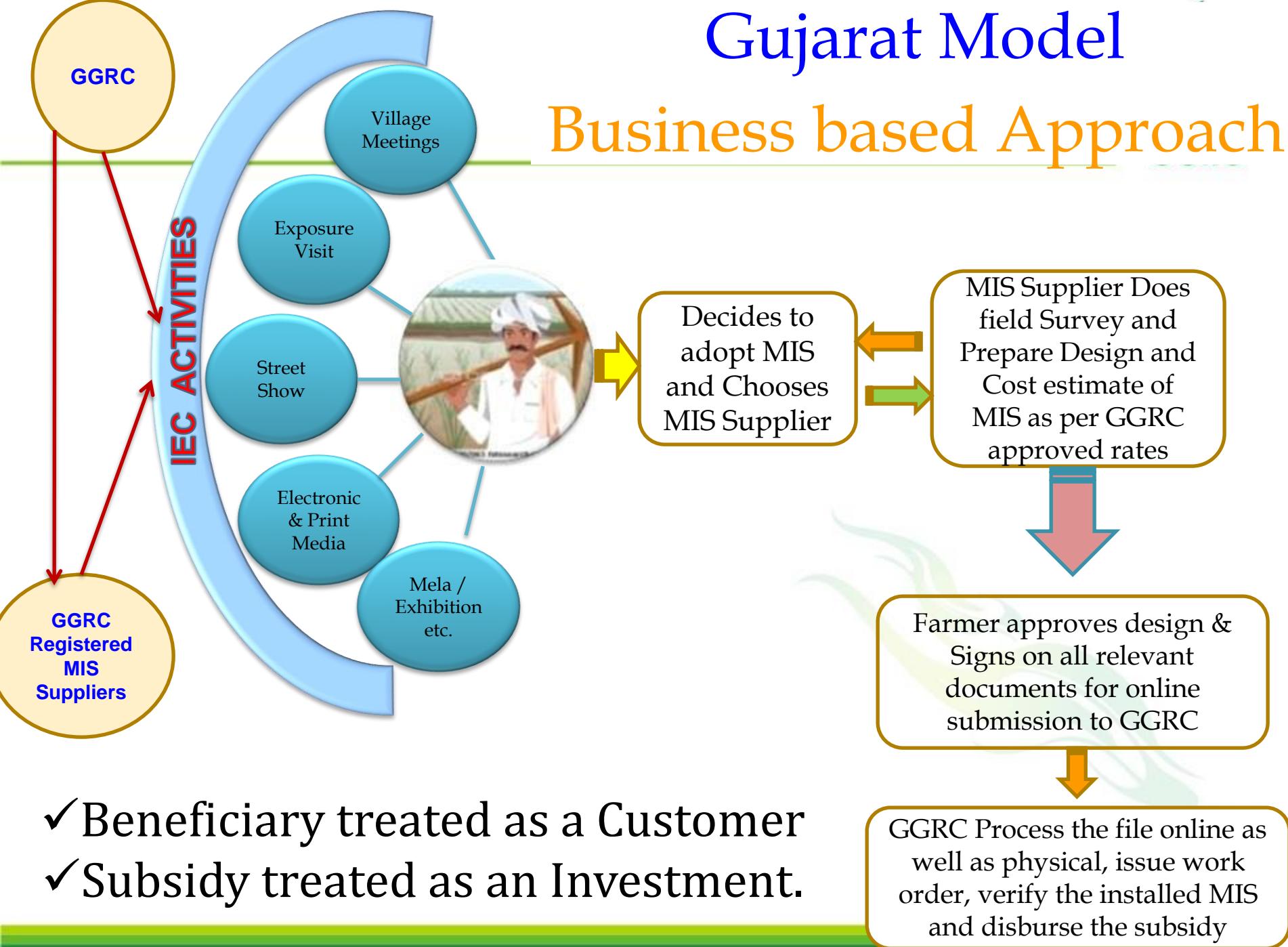
Other features

- ✓ Electricity connection on overriding priority.
- ✓ No subsidy ceiling

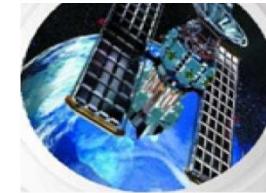
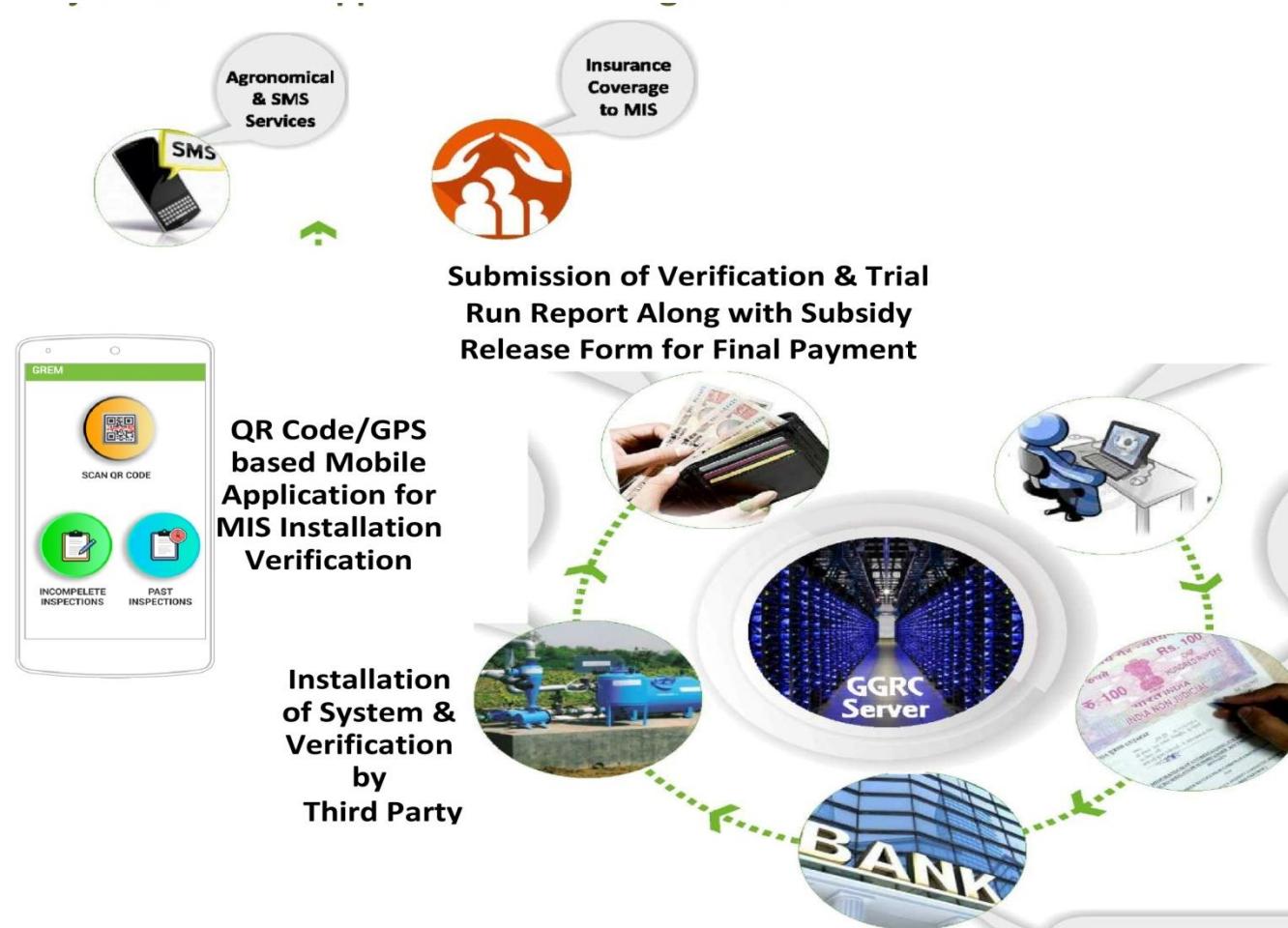
| Sr. No | Category of Farmer | Non Dark Zone area | Dark Zone area for 57 talukas |
|--------|---|--|--|
| 1 | General Farmer: (Land holders of more than 2 hectares) | Up to 50% of MIS Unit Cost or Rs. 60,000/- per hectares, whichever is less | Up to 60% of MIS Unit Cost or Rs. 60,000/- per hectares,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

Gujarat Model

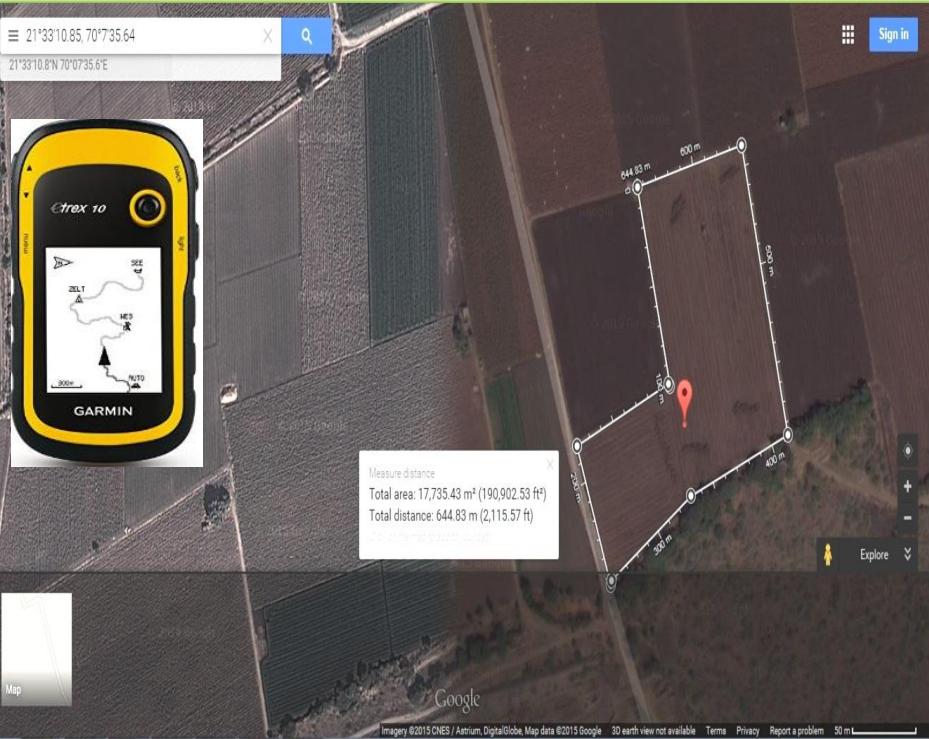
Business based Approach



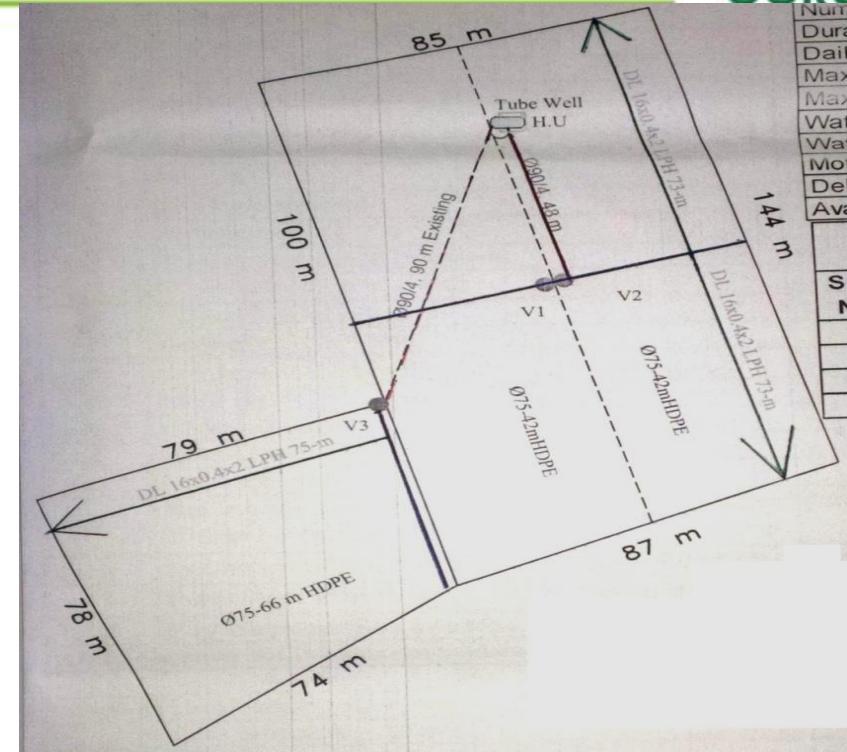
Gujarat Model of Application Processing at GGRC



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.



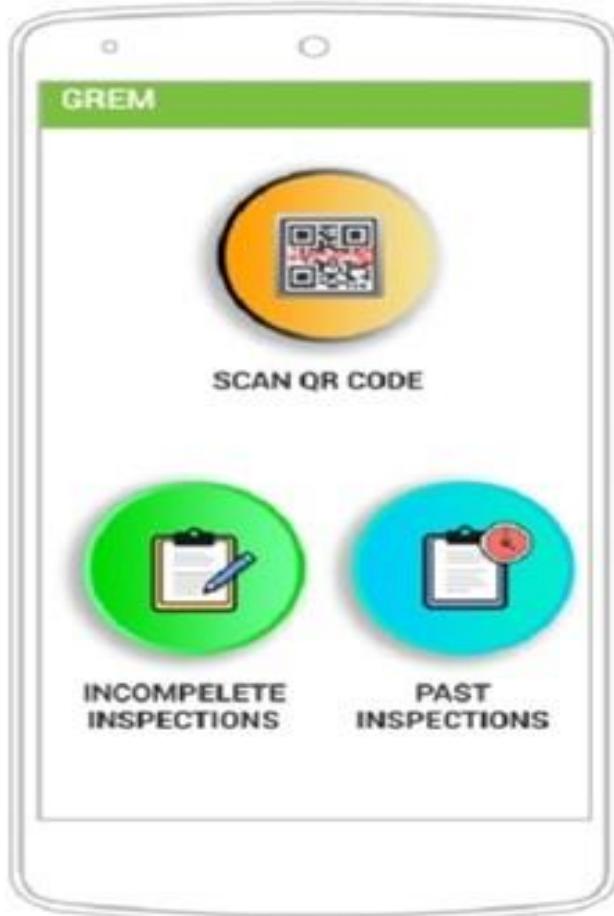
Transferring Geo-points as per the shape and size of the field to AUTOCAD for preparing Irrigation System Design



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.



**QR Code/GPS
based Mobile
Application for
MIS Installation
Verification**



QR Code

GPS based Monitoring & Evaluation



Google Map - Internet Explorer
http://172.16.30.81/gworkggrc/page/googlemap.aspx

Registration Details :

| | | |
|-----------------------|---|-----------------------------------|
| Reg No : 1415-MSN-659 | Name Of Farmer : PATEL RAJNIRANTBHAI SOMABHAI | Lonee/Nonlonee: LOANEE |
| MIS System : Drip | MIS Supplier : NETAFIM IRRIGATION INDIA PVT. LTD. | Source of Application : DARK ZONE |
| District : MEHSANA | Taluka : BECHRAJI | Village : MODHERA |

Latitude And Longitude : 23.5890172, 72.14955

Google Map - Internet Explorer
http://172.16.30.81/gworkggrc/page/googlemap.aspx

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| | | |
|-----------------------|---|-----------------------------------|
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| District : MEHSANA | Taluka : BECHRAJI | Village : MODHERA |

Latitude And Longitude : 23.5890172, 72.14955

Major IT Intervention for speedy and accurate processing



- Incorporation of Barcode System
- Biometric System



Thumb / fingerprint
Scanner



Webcam



Digital Sign.
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

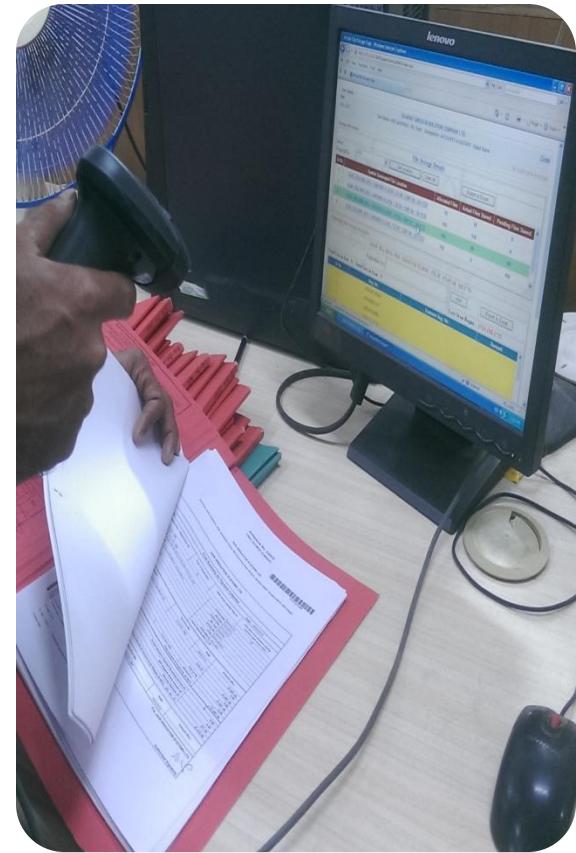
Drip Irrigation System with
One Filter

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

| | |
|--|--------------------------|
| GUJARAT GREEN REVOLUTION COMPANY LIMITED P.O. FERTIFIZZER AGRO, DELI, VADODARA-391 706 | |
| For GGRC official use only | |
|  GGRC | |
| GGRC Registration No.: _____ | |
| Farmer Name: _____ | |
| Village: _____ Taluka: _____ | |
| Dist.: _____ | |
| DIS | |
| Processing Stage | Work Order |
| | TPA |
| | FP Release |
| Cancellation | <input type="checkbox"/> |
| Auto Cancel | <input type="checkbox"/> |

DIS File 2015

| | |
|---|---------------------|
|  GGRCL | |
| GUJARAT GREEN REVOLUTION COMPANY LIMITED | |
| P.O. FERTILIZER NAGAR, DIST. VAISHNAVIA, 391750 | |
| GGRCL Registration No. : | |
| Farmer Name : _____ | |
| Village : _____, Taluka : _____ | |
| Dist. : _____ | |
| SIS | |
| Processing Stage | Work Order |
| | TPA |
| | FP Release |
| <input type="checkbox"/> | Cancellation |
| <input type="checkbox"/> | Auto Cancel |

SIS File 2015

| | | | | | | | | | |
|---|-------------------|--|-------------------|------------|-------------------|--|--|--|---|
|  GRGC GUJARAT GREEN REVOLUTION COMPANY LIMITED <small>P.O. FERTILIZERSAGAR, DIST. GUJARAT-361 706</small> | | | | | | | | | |
| GGRC Registration No. : _____ | | | | | | | | | |
| Farmer Name : _____ Village : _____ Taluka : _____ District : _____ | | | | | | | | | |
| DIS <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="width: 30%; text-align: center; padding: 5px;"> Processing Stage </td> <td style="width: 30%; text-align: center; padding: 5px;"> Work Order </td> <td style="width: 40%; text-align: center; padding: 5px;"> TPA </td> </tr> <tr> <td style="width: 30%; text-align: center; padding: 5px;"> FP Release </td> <td style="width: 40%; text-align: center; padding: 5px;"> Cancellation <input type="checkbox"/> </td> </tr> <tr> <td></td> <td></td> <td style="text-align: center; padding: 5px;"> Auto Cancel <input type="checkbox"/> </td> </tr> </table> | | Processing Stage | Work Order | TPA | FP Release | Cancellation <input type="checkbox"/> | | | Auto Cancel <input type="checkbox"/> |
| Processing Stage | Work Order | | TPA | | | | | | |
| | FP Release | Cancellation <input type="checkbox"/> | | | | | | | |
| | | Auto Cancel <input type="checkbox"/> | | | | | | | |

DIS File 2014

| | | |
|---|--------------------------|--------------------------|
|  GUJARAT GREEN REVOLUTION COMPANY LIMITED P.O. FERTILIZER NAGAR, BURE, VADODARA-391 700 | | |
| GGRC Registration No. : _____ | | |
| Farmer Name : _____ Village : _____ Taluka : _____ District : _____ | | |
| SIS | | |
| Processing Stage | Work Order | <input type="checkbox"/> |
| | TPA | <input type="checkbox"/> |
| | FP Release | <input type="checkbox"/> |
| Cancellation | <input type="checkbox"/> | |
| Auto Cancel | <input type="checkbox"/> | |

SIS File 2014

| | | | | | | | | | |
|---|------------------------------------|--|--|-------------|------------------------------------|------------------------------------|---|--|--|
|  | | For GGRC official use only | | | | | | | |
| GUJARAT GREEN REVOLUTION COMPANY LIMITED P.O. GURU TIRTH JERAGAR, 2035, VADODARA, 390 001 | | | | | | | | | |
|  | | MHS Registration No.: <input style="width: 100px;" type="text"/> | | | | | | | |
| NABARD'S Capital Subsidy Scheme of Govt for Promoting Solar Photovoltaic (SPV) Water Pumping Systems for Irrigation Purpose | | | | | | | | | |
| GGRC Registration No.: <input style="width: 100px;" type="text"/> | | | | | | | | | |
| Farmer Name : _____ Village : _____ Taluka : _____ Dist : _____ | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center; padding: 5px;"> 3 HP </td> <td style="width: 33%; text-align: center; padding: 5px;"> AC <input type="checkbox"/> </td> <td style="width: 33%; text-align: center; padding: 5px;"> DC <input type="checkbox"/> </td> </tr> <tr> <td colspan="3" style="text-align: center; padding: 5px;"> Technical Sanction Trial Run Completed </td> </tr> </table> | | | | 3 HP | AC <input type="checkbox"/> | DC <input type="checkbox"/> | Technical Sanction Trial Run Completed | | |
| 3 HP | AC <input type="checkbox"/> | DC <input type="checkbox"/> | | | | | | | |
| Technical Sanction Trial Run Completed | | | | | | | | | |
| Stacking of Company Logo Solar Pump Supplier | | Name of Bank for Loan Bank Branch and Address | | | | | | | |

Solar File 2015

List of doc. Annex.

Unique Features responsible for Success of GGRC Model



- I. Simple and Flexible in its Approach
- II. Transparency in its Approach Application tracking
- 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

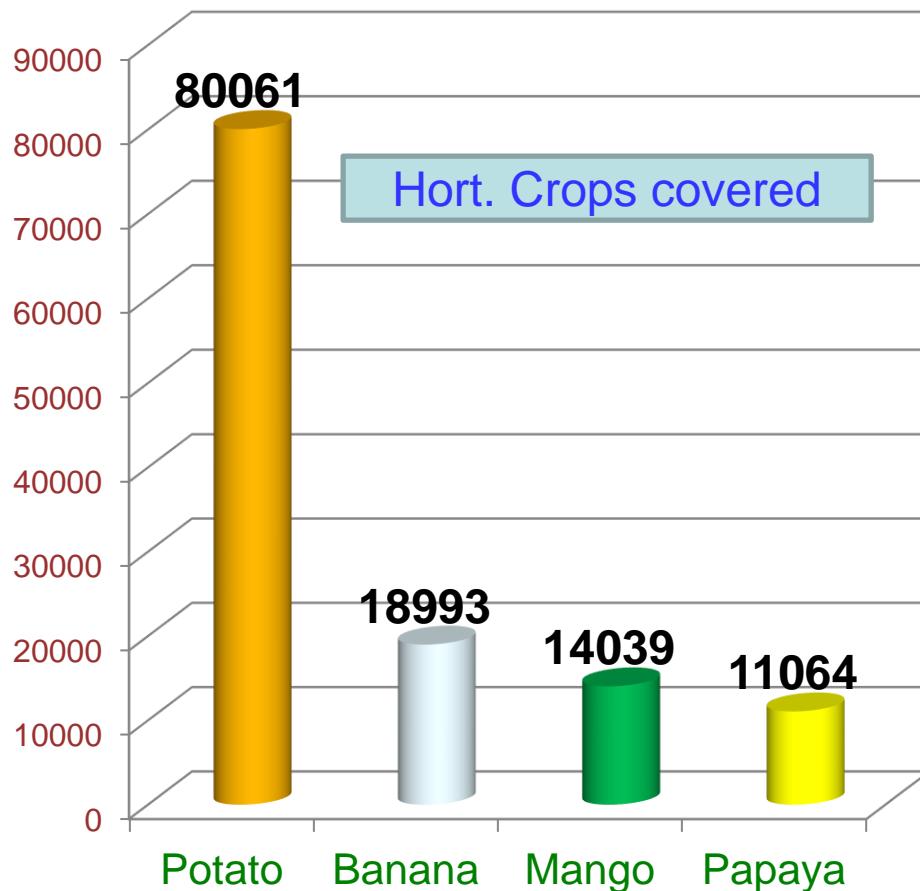
- The achievement under MIS Scheme was 2.26 lakh hectares with approximate 1.41 lakh beneficiary farmers
(From 1991 to 2005).
- Average Annual Achievement **was 15,000 ha./year**

After establishment of GGRC

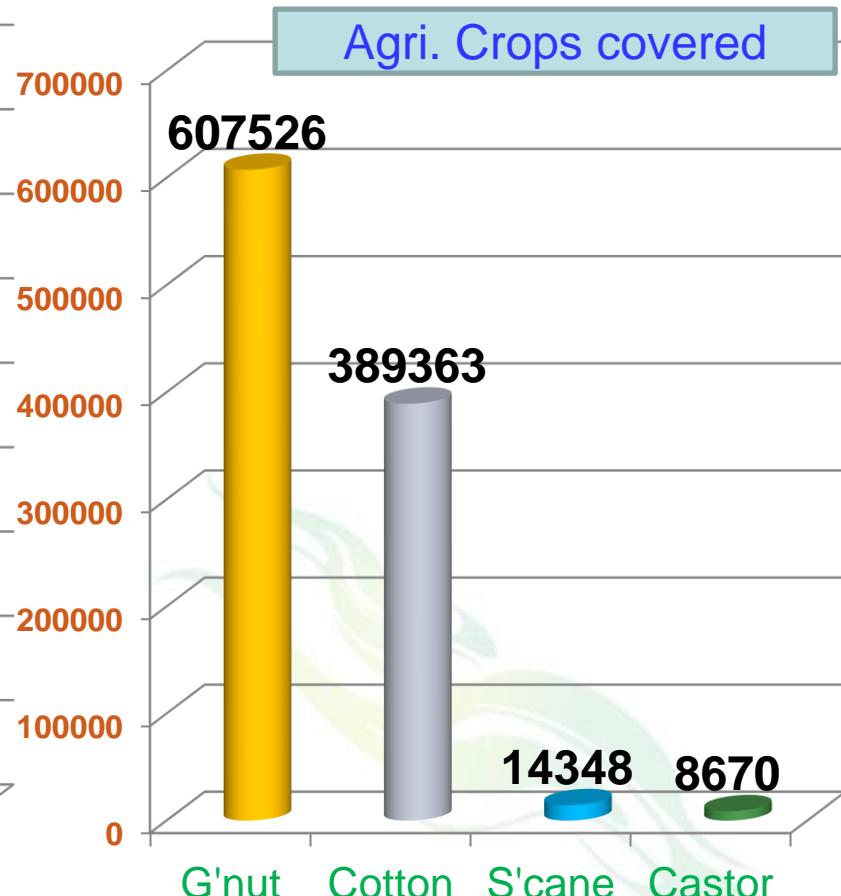
- The achievement under MIS Scheme is 13,93,246 hectares with 8,67,172 beneficiary farmers
(From 2005 to Sept-2016)
- Average Annual Achievement is **1.21 lakh ha./year**
- Gujarat **ranking continuously first since last four years** in terms of bringing **area** under Micro irrigation per annum among 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**



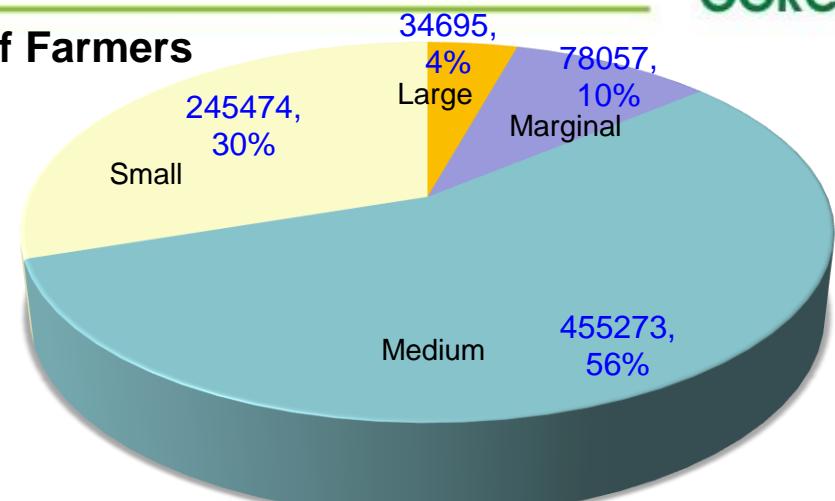
Over all Farmers category wise (based on holding size) no. of farmers and area covered from 2005-06 to 2015-16



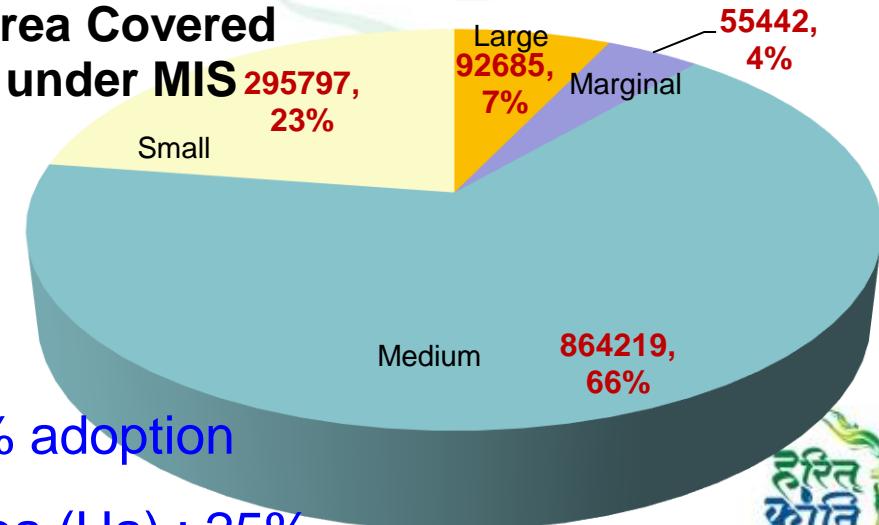
Classification of Farmers on the basis of land holding in the state

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

No. of Farmers



Area Covered under MIS



Small and Marginal no. of farmers : 38% adoption

Small and Marginal farmers covered area (Ha) : 25%

Concurrent Monitoring and Evaluation of the MI Scheme



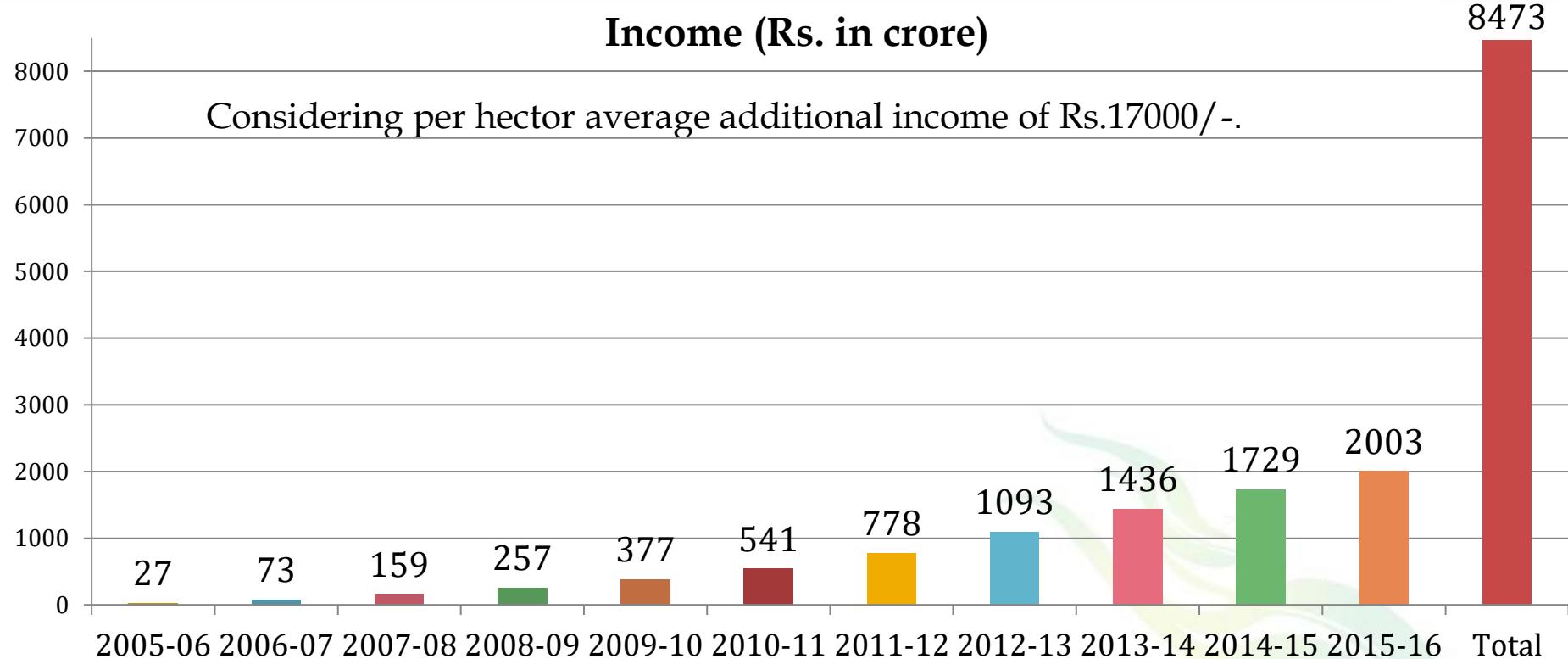
- Cabinet Sub-Committee on Micro Irrigation meets at least twice in a year, to review performance and deliberate on policy initiatives and implementation imperatives to improve implementation of the Scheme.
- As per the report of Concurrent Evaluation of the Scheme submitted by the AFC India Limited (earlier Agricultural Finance Corporation - GoI):
[Findings contained in the AFC report](#)

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

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 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, Dresden, 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





QR Code Scanning



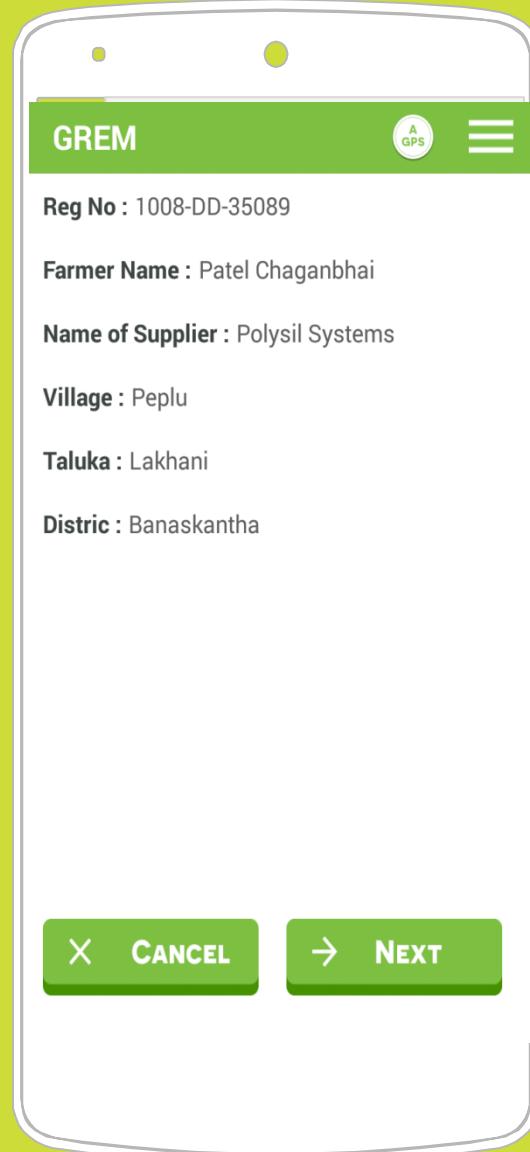
Cont...



GREM APP

TRIAL FORM HEADER INFO

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.



Cont...



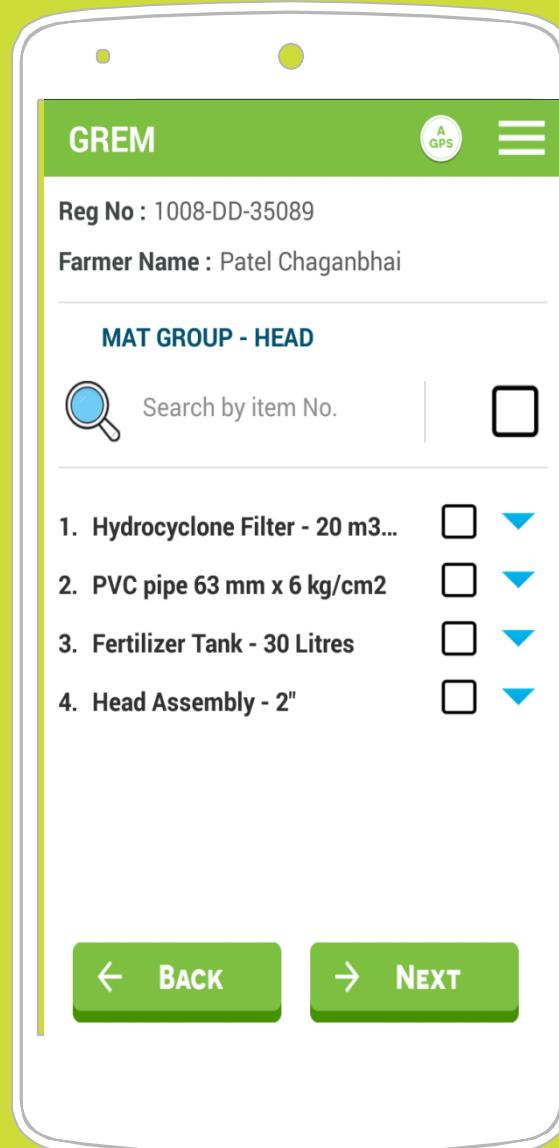
GREM APP

MAT GROUP-HEAD

This screen lists all items from the Mat Group - Head.

Functions:

- ▶ Search Item
- ▶ Check all “OK”



Cont...



GREM APP

Lastly, the user can upload one or more photographs of:

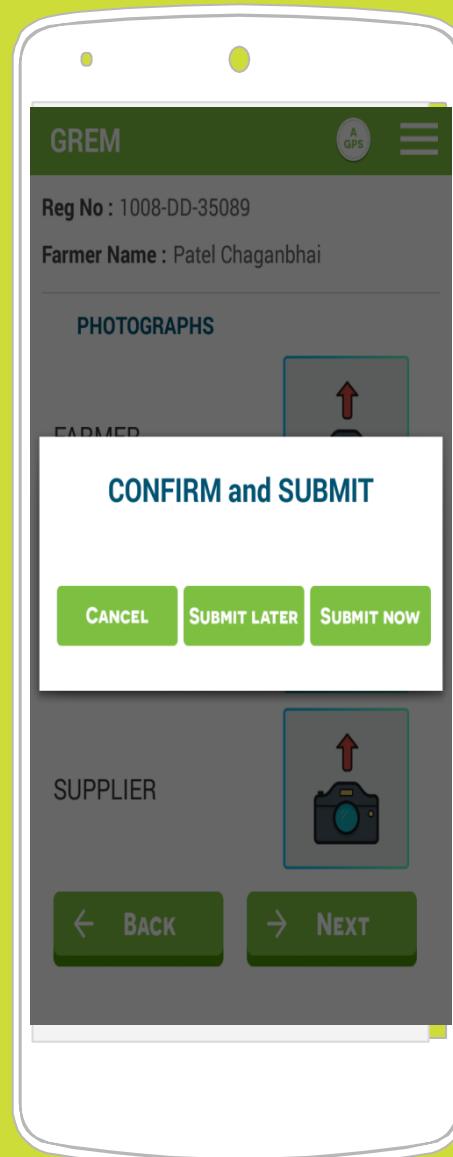
- ▶ Farmer
- ▶ Unit
- ▶ Supplier





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



GPS IMAGE VIEW - Windows Internet Explorer

http://172.16.30.10/gworks/page/GWORKSVIEWIMG.aspx

Registration Details :

| | | | | | |
|--------------|---------------|------------------|-------------------------|-------------------------|-------------|
| Reg No : | 1415-ARV-3360 | Name Of Farmer : | KHARADI BABUBHAI SALUJI | Lonee/NonLoanee: | NONLOANEE |
| MIS System : | DRIP | MIS Supplier : | EPC INDUSTRIES LTD. | Source of Application : | TRIBAL DEPT |
| District : | ARVALLI | Taluka : | BHILODA | Village : | DHANDHASAN |
| Inspector : | SGS | | | | |

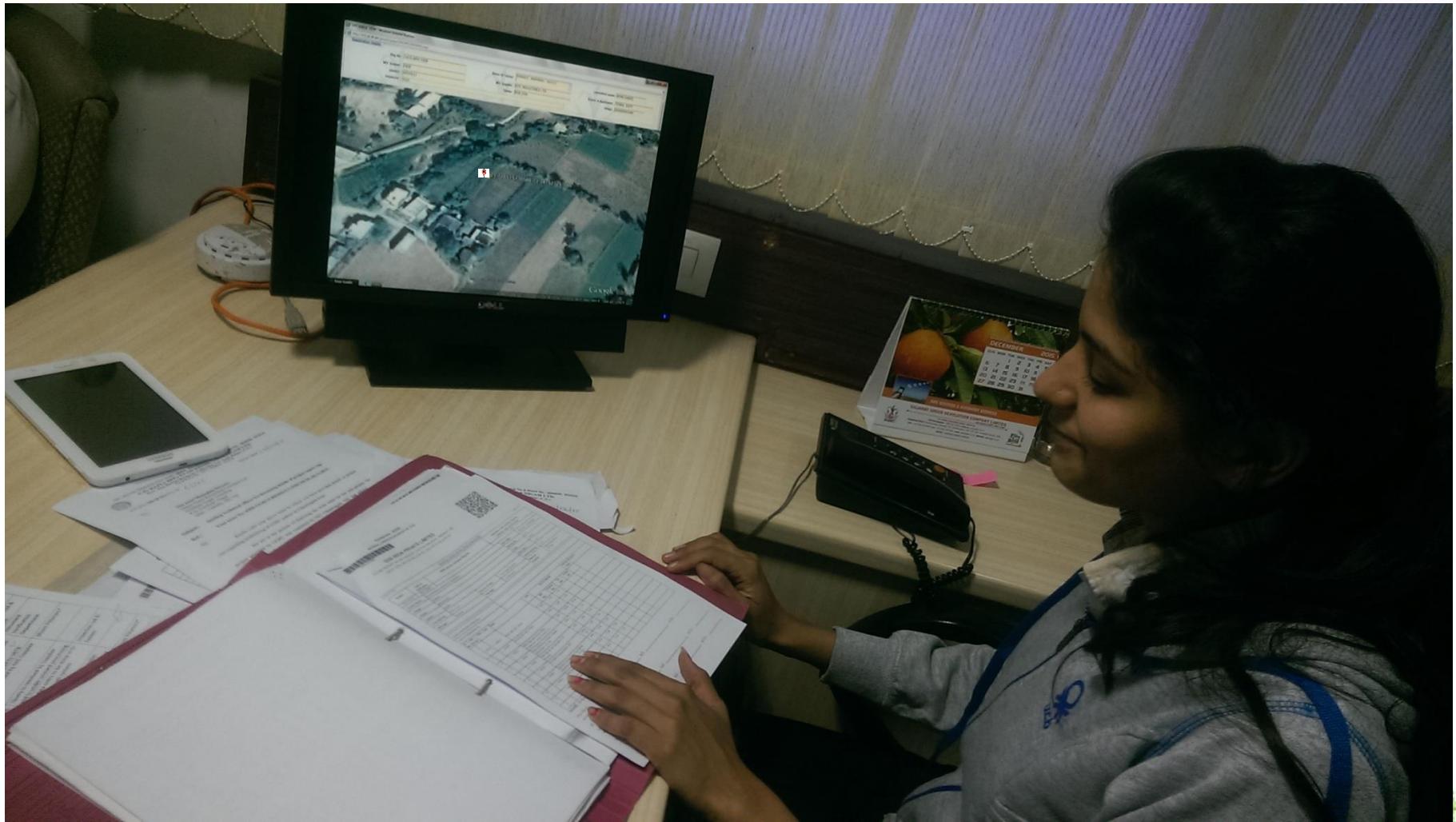
Image Details:

| ID | Regno | LATITUDE | LONGITUDE | Images | IMGLocation |
|----|---------------|-----------------|-----------------|--------|--------------------------|
| 1 | 1415-ARV-3360 | 23.762818780000 | 73.266997610000 | | View Map |
| 2 | 1415-ARV-3360 | 23.762822630000 | 73.266998710000 | | View Map |
| 3 | 1415-ARV-3360 | 23.762824220000 | 73.266999020000 | | View Map |
| 4 | 1415-ARV-3360 | 23.763031290000 | 73.266992230000 | | View Map |
| 5 | 1415-ARV-3360 | 23.716560228902 | 73.347555801742 | | View Map |
| 6 | 1415-ARV-3360 | 23.716515736566 | 73.347527297666 | | View Map |
| 7 | 1415-ARV-3360 | 23.716522028786 | 73.347518085194 | | View Map |
| 8 | 1415-ARV-3360 | 23.716406134795 | 73.346903777676 | | View Map |

javascript:_doPostBack('grdimage\$ctl06\$LinkButton1','')

100%

Verification by Engineers at GGRC through Google Map



श्रोत



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



Cont...



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.



Objective and Consultative Unit-Cost Revision Methodology

- 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

Cont...



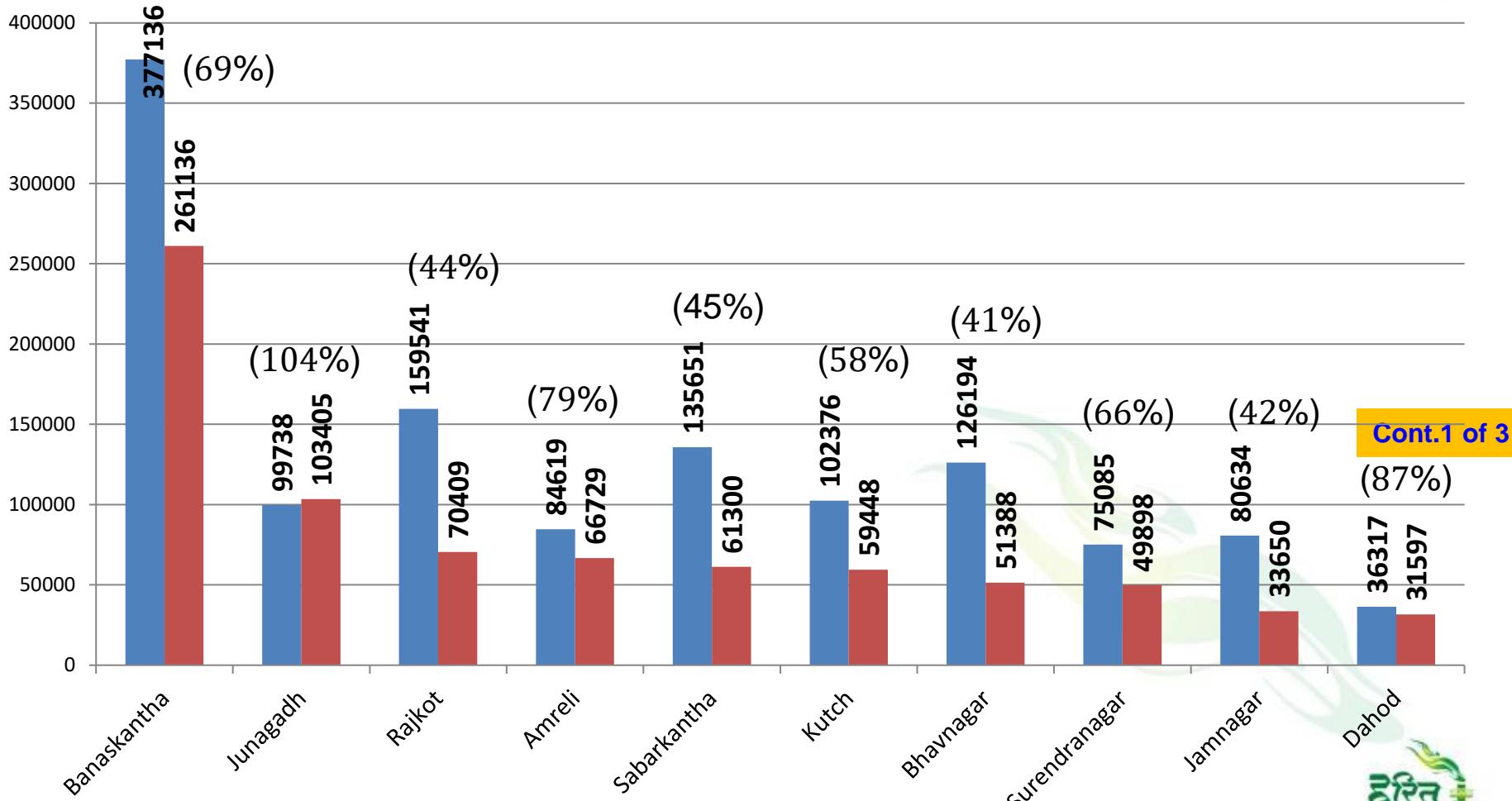
- *Inclusion of MIS in SSNNL canal command area as Pilot Project – Convergence with major irrigation scheme*
- *Dovetailing of Tribal Development Funds and MIS Scheme with the Provision of discriminatory subsidy up to 75 %*
- *Digitalization of MIS beneficiary files and records underway*
- Subsidy based 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)

Area in Hectare



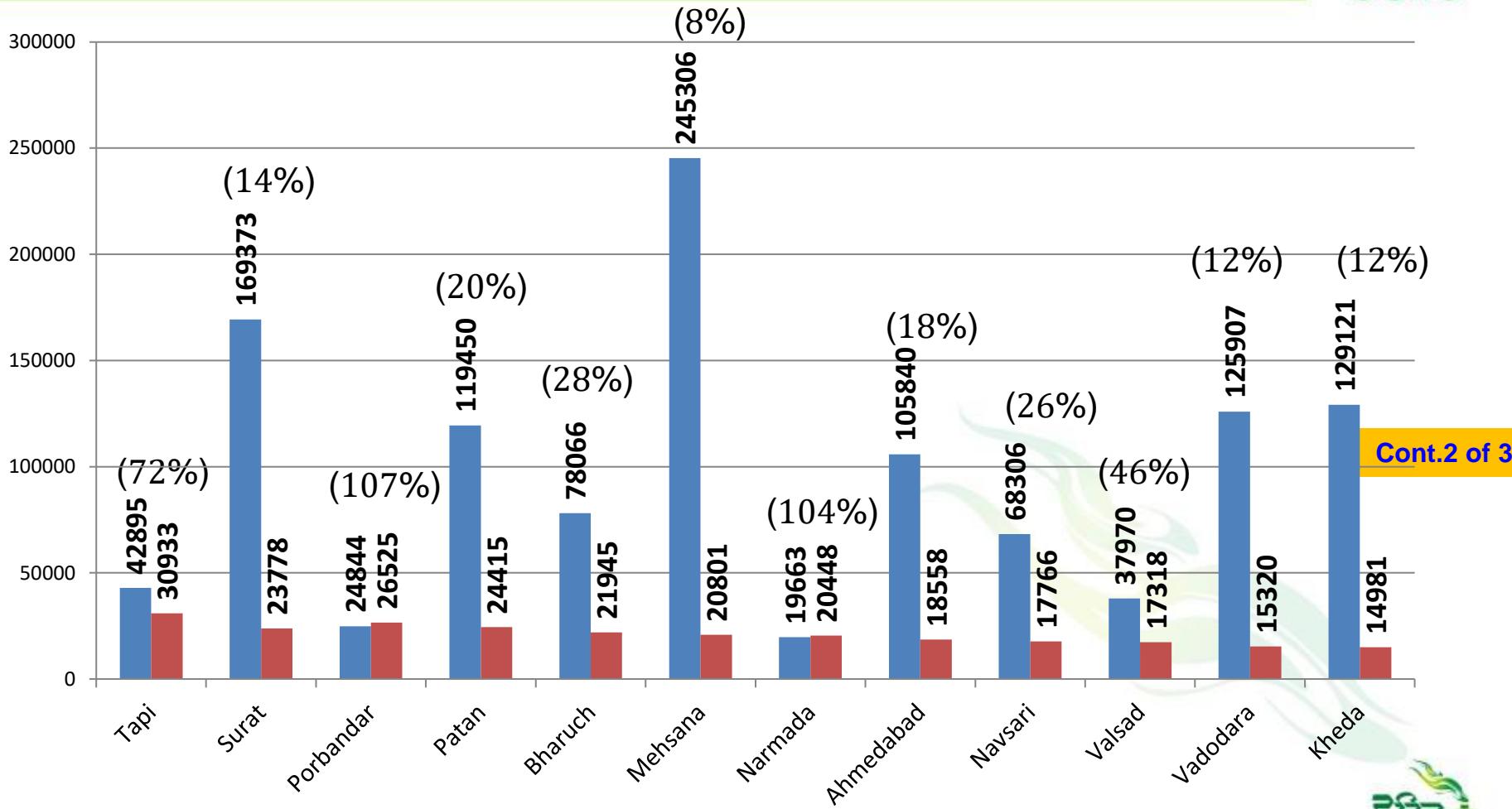
Source: Department of Agri. Cooperation website



District wise area covered against Irrigated area (up to March-2016)



Area in Hectare



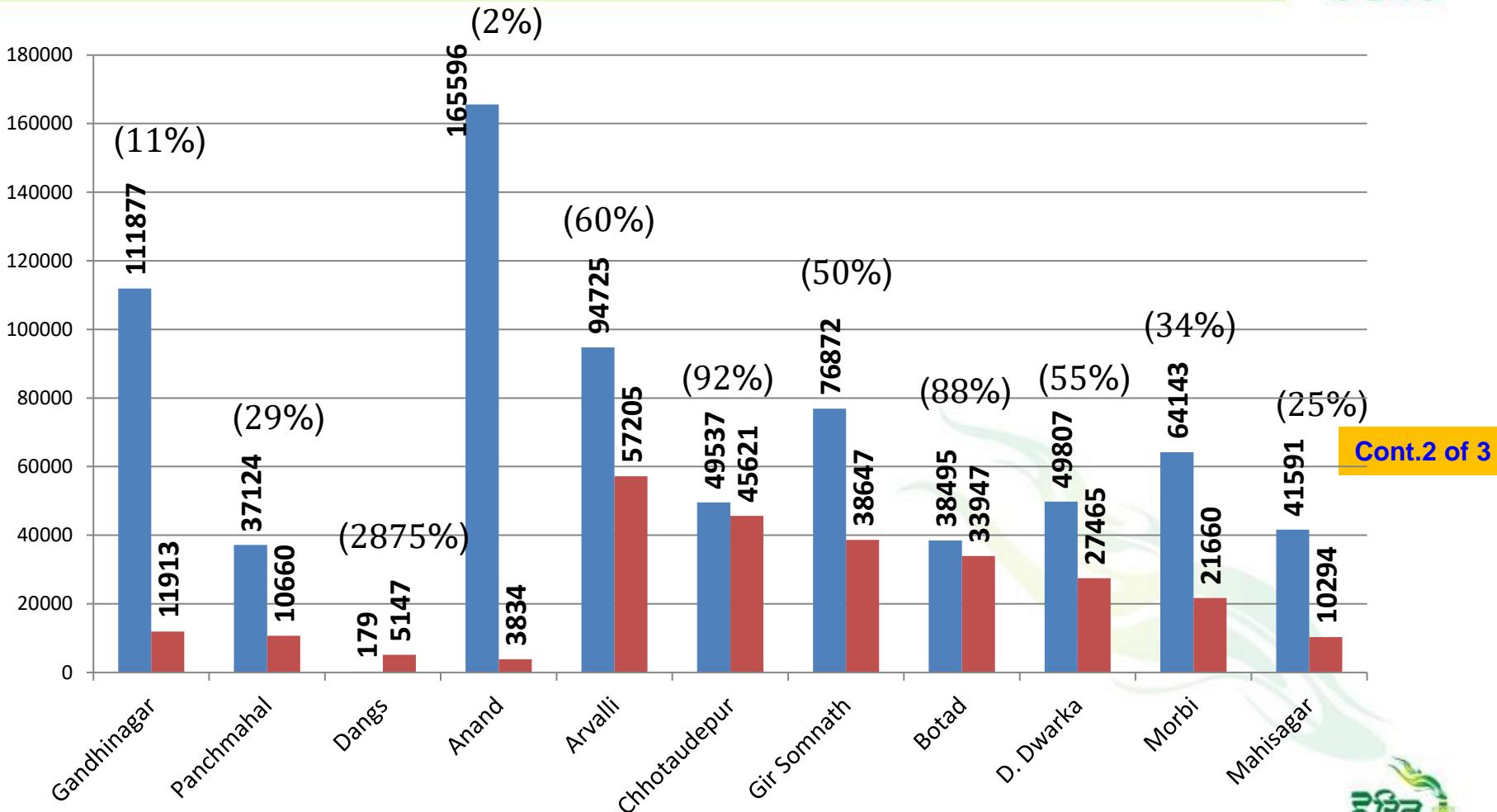
Source: Department of Agri. Cooperation website





District wise area covered against Irrigated area (up to March-2016)

Area in Hectare



Source: Department of Agri. Cooperation website



District wise area covered against Irrigated area (up to March-2016)



Area in Hectare

| District | Total Irrigated Area (Ha) * | Area (Ha.) | | | % irrigated area covered |
|---------------|--------------------------------------|------------|-----------|--------|-----------------------------|
| | | Drip | Sprinkler | Total | |
| Banaskantha | 377136 | 146438 | 114698 | 261136 | 69% |
| Junagadh | 99738 | 16611 | 86794 | 103405 | 104% |
| Rajkot | 159541 | 44890 | 25520 | 70409 | 44% |
| Amreli | 84619 | 31966 | 34762 | 66729 | 79% |
| Sabarkantha | 135651 | 49643 | 11657 | 61300 | 45% |
| Kutch | 102376 | 45613 | 13836 | 59448 | 58% |
| Bhavnagar | 126194 | 28478 | 22910 | 51388 | 41% |
| Surendranagar | 75085 | 27376 | 22522 | 49898 | 66% |
| Jamnagar | 80634 | 21186 | 12464 | 33650 | 42% |
| Dahod | 36317 | 1387 | 30210 | 31597 | 87% |

Cont.1 of 3



Source: Department of Agri. Cooperation website



District wise area covered against Irrigated area (up to March-2016)

Area in Hectare

| District | Total Irrigated Area (Ha) * | Area (Ha.) | | | % irrigated area covered |
|-----------|-----------------------------------|------------|-----------|-------|-----------------------------|
| | | Drip | Sprinkler | Total | |
| Tapi | 42895 | 7538 | 23395 | 30933 | 72% |
| Surat | 169373 | 9651 | 14127 | 23778 | 14% |
| Porbandar | 24844 | 1848 | 24677 | 26525 | 107% |
| Patan | 119450 | 4646 | 19769 | 24415 | 20% |
| Bharuch | 78066 | 16054 | 5891 | 21945 | 28% |
| Mehsana | 245306 | 9066 | 11735 | 20801 | 8% |
| Narmada | 19663 | 10857 | 9591 | 20448 | 104% |
| Ahmedabad | 105840 | 2803 | 15755 | 18558 | 18% |
| Navsari | 68306 | 5045 | 12721 | 17766 | 26% |
| Valsad | 37970 | 5140 | 12178 | 17318 | 46% |
| Vadodara | 125907 | 11833 | 3487 | 15320 | 12% |
| Kheda | 129121 | 8666 | 6315 | 14981 | 12% |

Cont.2 of 3



Source: Department of Agri. Cooperation website



District wise area covered against Irrigated area (up to March-2016)

Area in Hectare

| District | Total Irrigated Area (Ha) * | Area (Ha.) | | | % irrigated area covered |
|---------------|-----------------------------------|---------------|---------------|----------------|-----------------------------|
| | | Drip | Sprinkler | Total | |
| Gandhinagar | 111877 | 8972 | 2940 | 11913 | 11% |
| Panchmahal | 37124 | 1955 | 8705 | 10660 | 29% |
| Dangs | 179 | 111 | 5036 | 5147 | 2875% |
| Anand | 165596 | 3805 | 29 | 3834 | 2% |
| Arvalli | 94725 | 40690 | 16514 | 57205 | 60% |
| Chhotauddepur | 49537 | 8958 | 36664 | 45621 | 92% |
| Gir Somnath | 76872 | 12645 | 26003 | 38647 | 50% |
| Botad | 38495 | 31772 | 2176 | 33947 | 88% |
| D. Dwarka | 49807 | 5932 | 21533 | 27465 | 55% |
| Morbi | 64143 | 16098 | 5563 | 21660 | 34% |
| Mahisagar | 41591 | 2987 | 7308 | 10294 | 25% |
| Total | 3173978 | 640660 | 667483 | 1308143 | 41% |

Cont. 3 of 3

Source: Department of Agri. Cooperation website

