



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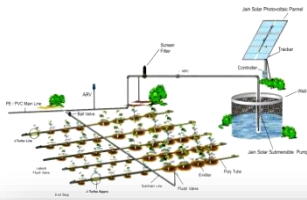
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The role of **Gujarat Green Revolution Company Ltd.**
in building resilience among the farmer through adoption of
Smart Agricultural Technology in the light of climate change
to sustain the food security

14th October.-2016, AAU-Anand



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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.

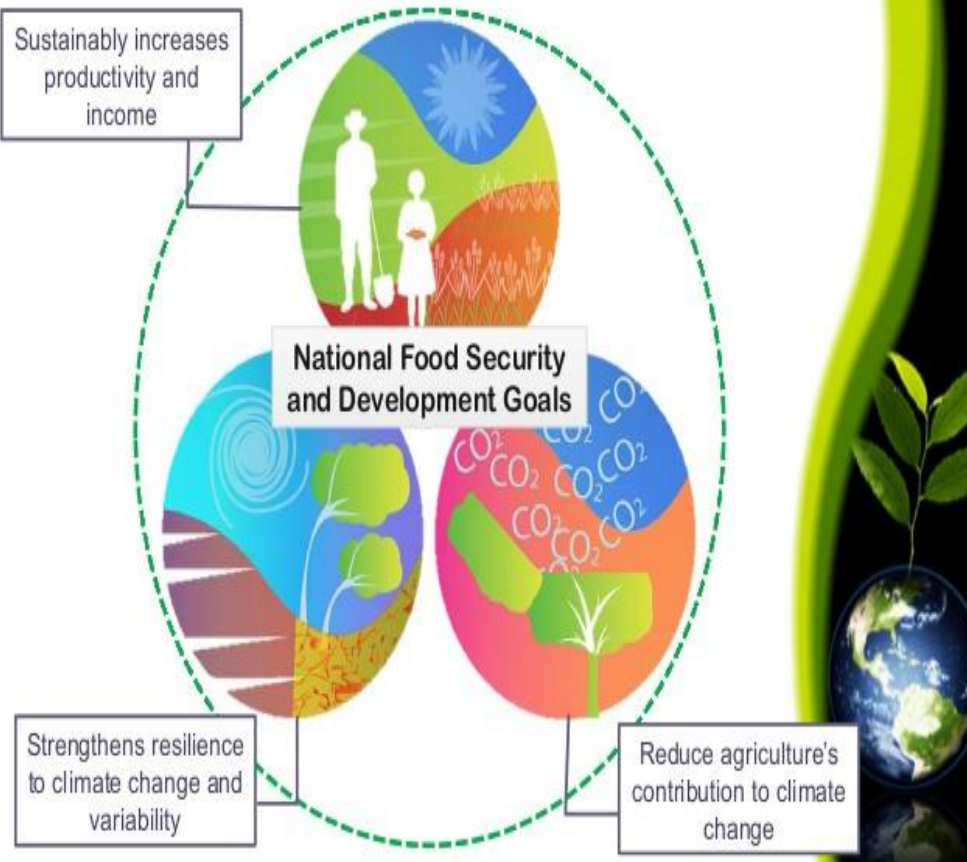


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What is CSA?

CLIMATE SMART
Agriculture



- 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



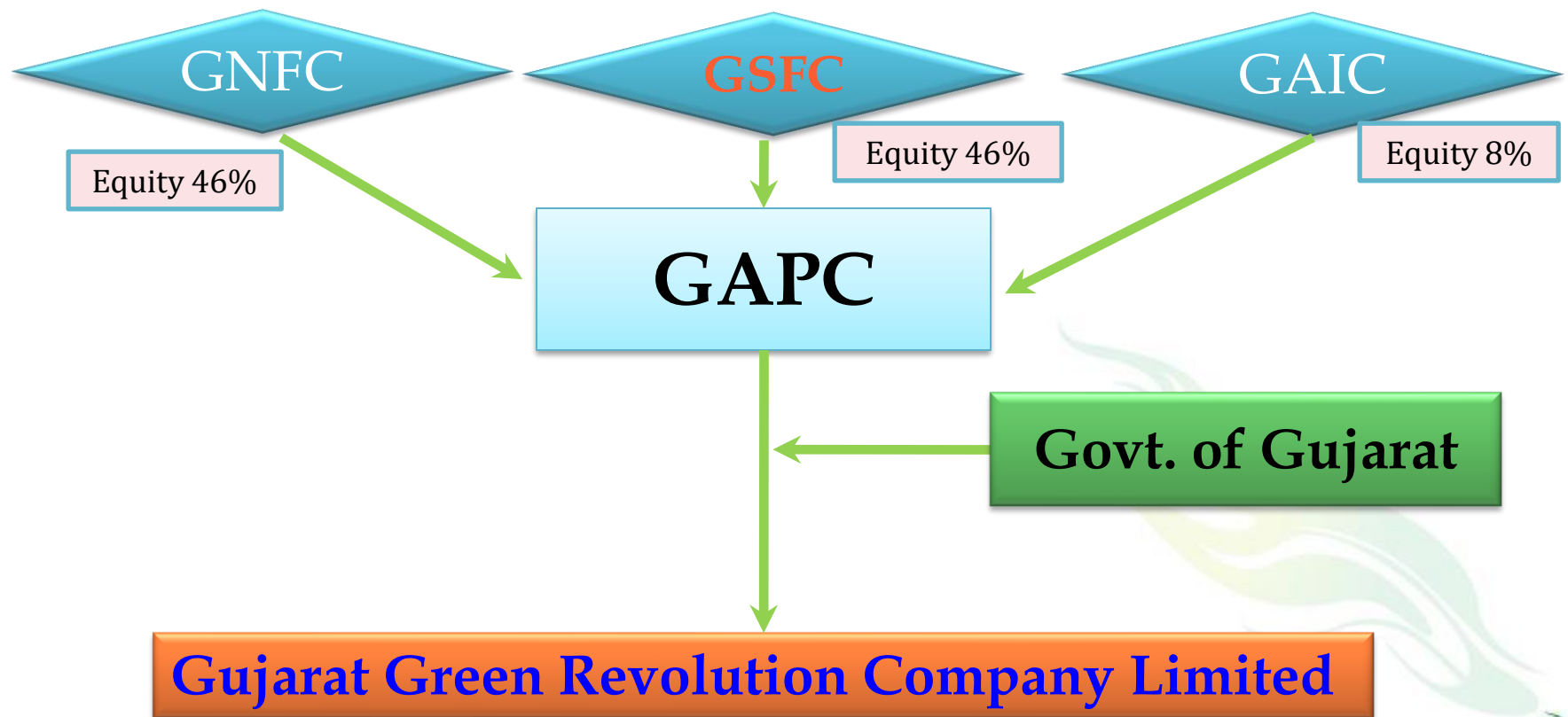
Reason for Gujarat State Intervention in MIS Scheme



- 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**

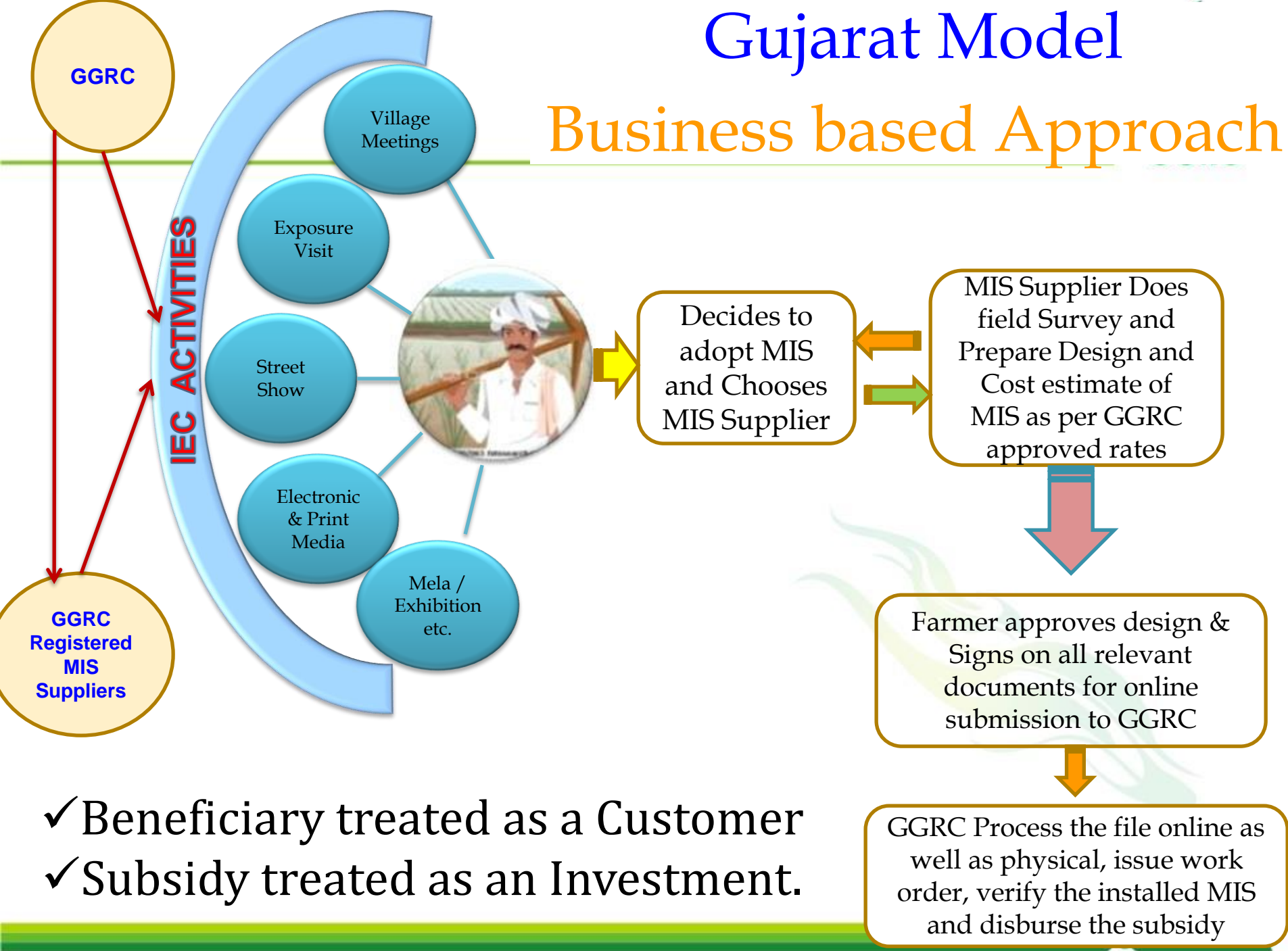
Other features

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

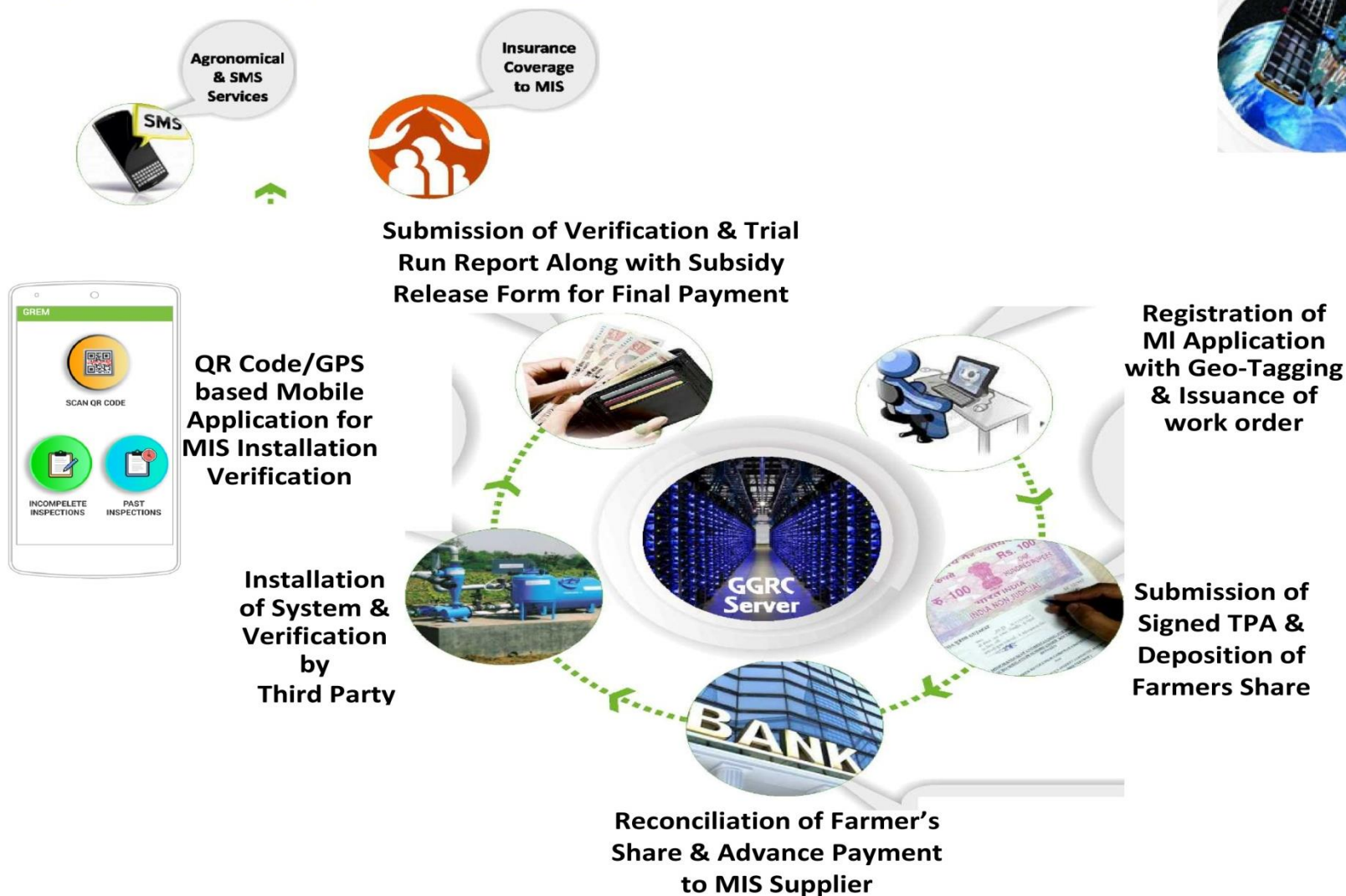
Sr. No	Category of Farmer	Non Dark Zone area	Dark Zone area for 57 talukas
1	General Farmer: (Land holders of more than 2 hectares)	Up to 50% of MIS Unit Cost or Rs. 60,000/- per hectares, whichever is less	Up to 60% of MIS Unit Cost or Rs. 60,000/- per hectares, whichever is less
2	General Farmer: Small 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



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.

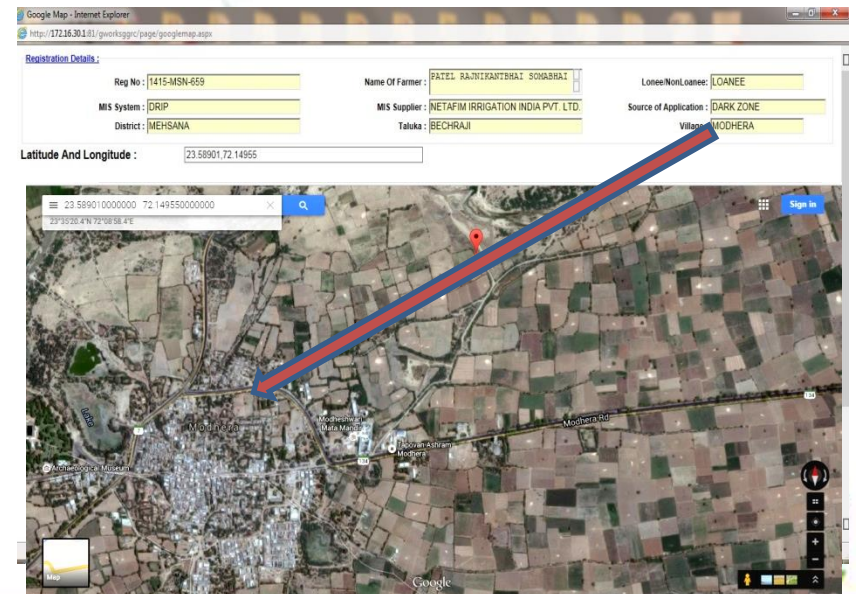
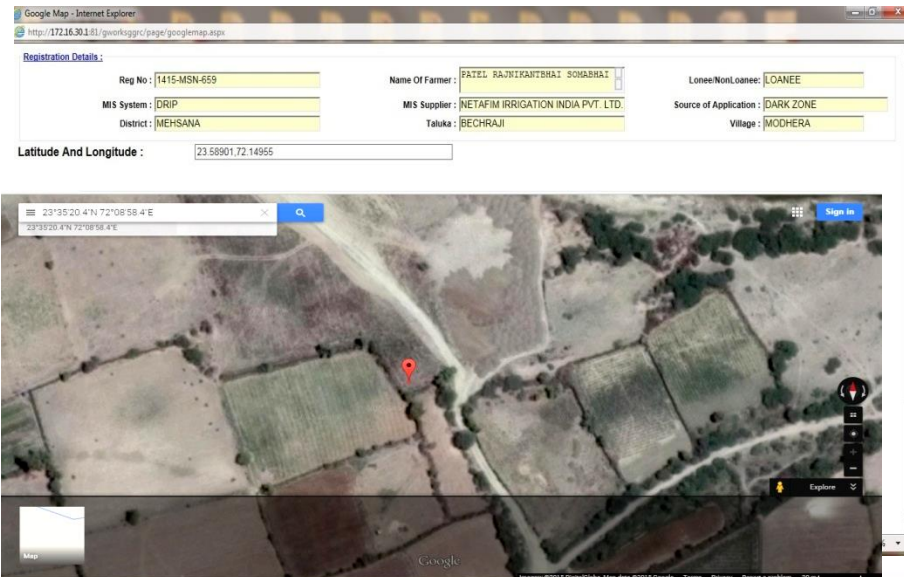
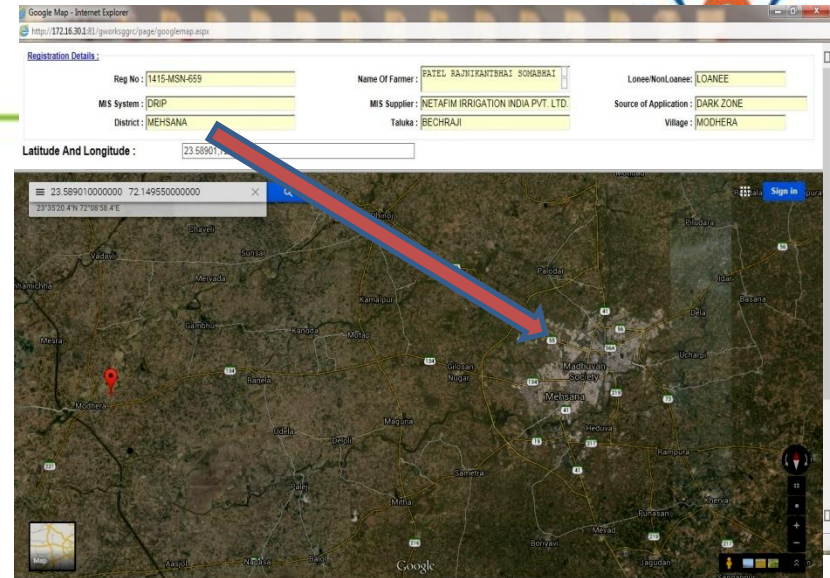


**QR Code/GPS
based Mobile
Application for
MIS Installation
Verification**

QR Code



GPS based Monitoring & Evaluation



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

For GGRC official use only

GUJARAT GREEN REVOLUTION COMPANY LIMITED
P.O. FERTILIZERSAGAR, DIST. VADODHA-391 700

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

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GUJARAT GREEN REVOLUTION COMPANY LIMITED
P.O. FERTILIZERSAGAR, DIST. VADODHA-391 700

GGRC

GGRC Registration No. : _____

Farmer Name : _____
Village : _____ Taluka : _____
Dist : _____

SIS

Processing Stage	Work Order
	TPA
	FP Release
	Cancellation <input type="checkbox"/>
	Auto Cancel <input type="checkbox"/>

SIS File 2015

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GGRC

GGRC Registration No. : _____

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Village : _____ Taluka : _____
Dist : _____

DIS

Processing Stage	Work Order
	TPA
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	Cancellation <input type="checkbox"/>
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DIS File 2014

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GGRC

GGRC Registration No. : _____

Farmer Name : _____
Village : _____ Taluka : _____
Dist : _____

SIS

Processing Stage	Work Order
	TPA
	FP Release
	Cancellation <input type="checkbox"/>
	Auto Cancel <input type="checkbox"/>

SIS File 2014

For GGRC official use only

GUJARAT GREEN REVOLUTION COMPANY LIMITED
P.O. FERTILIZERSAGAR, DIST. VADODHA-391 700

GGRC

MIS Registration No. : _____

NABARD'S Capital Subsidy Scheme of Govt for Promoting Solar Photo-voltaic (SPV) Water Pumping Systems for Irrigation Purpose

GGRC Registration No. : _____

Farmer Name : _____
Village : _____ Taluka : _____
Dist : _____

3 HP ☐ AC ☐ DC ☐

Processing Stage

Technical Sanction
Trial Run Completed

Stamping of Company Logo Solar Pump Supplier

Name of Bank for Loan
Bank Branch and Address

Solar File 2015

For GGRC official use only

GUJARAT GREEN REVOLUTION COMPANY LIMITED
P.O. FERTILIZERSAGAR, DIST. VADODHA-391 700

GGRC

GGRC Registration No. : _____

Farmer Name : _____
Village : _____ Taluka : _____
Dist : _____

3 HP ☐ AC ☐ DC ☐

Processing Stage

Technical Sanction
Trial Run Completed

Stamping of Company Logo Solar Pump Supplier

Name of Bank for Loan
Bank Branch and Address

List of doc. Annex.

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.

Application tracking



Result of State Effectiveness



Before establishment of GGRC

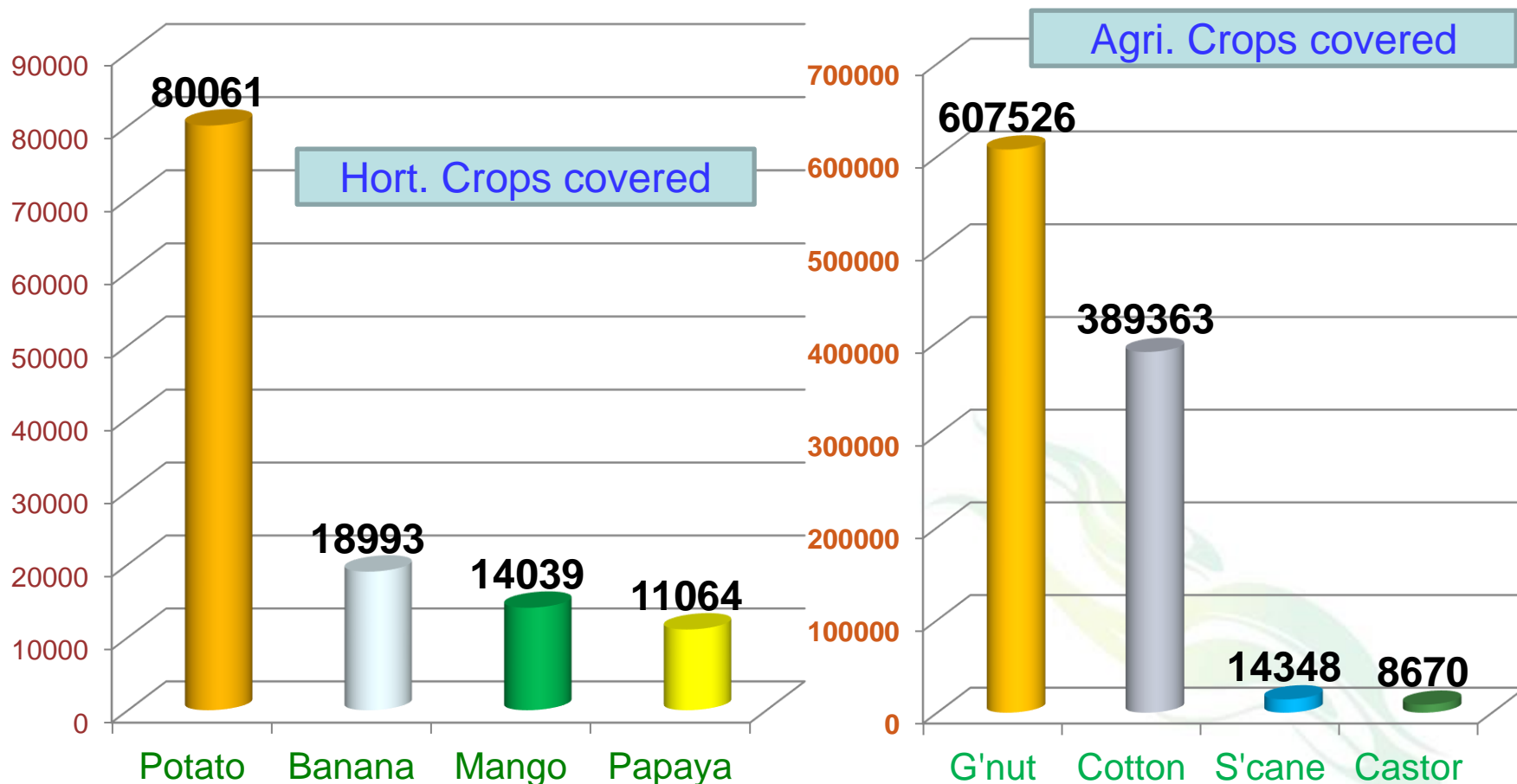
- The achievement under MIS Scheme was 2.26 lakh hectares with approximate 1.41 lakh beneficiary farmers (From 1991 to 2005).
- Average Annual Achievement was 15,000 ha./year

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

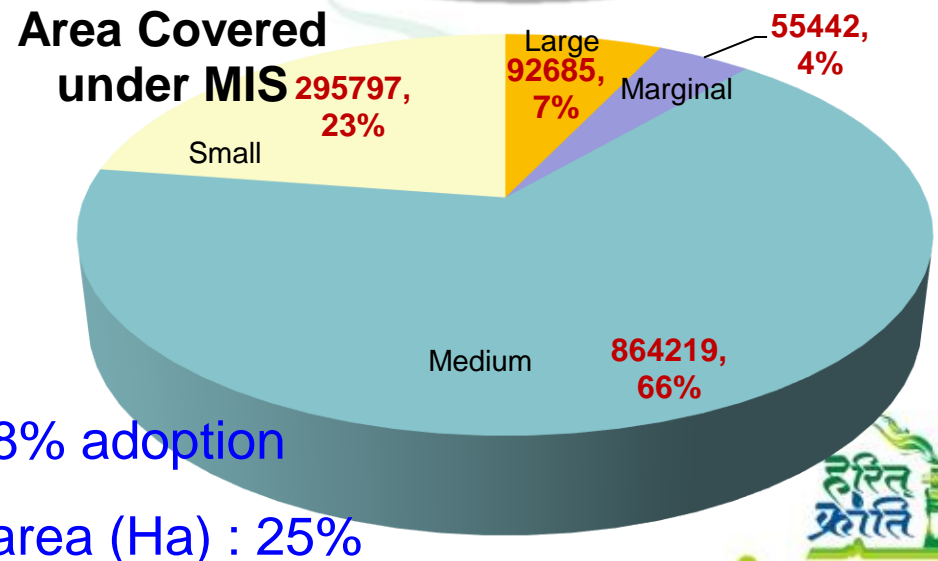
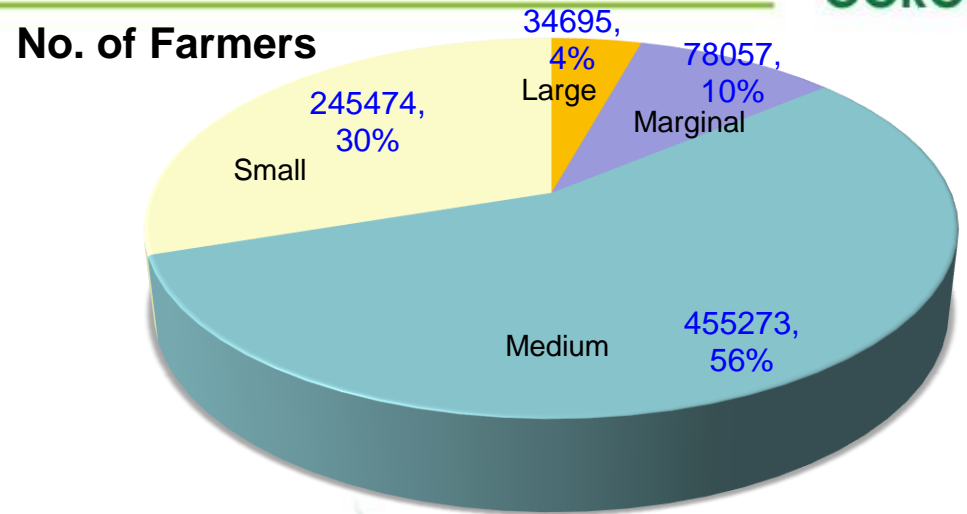


Over all Farmers category wise (based on holding size) no. of farmers and area covered from 2005-06 to 2015-16



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

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/-

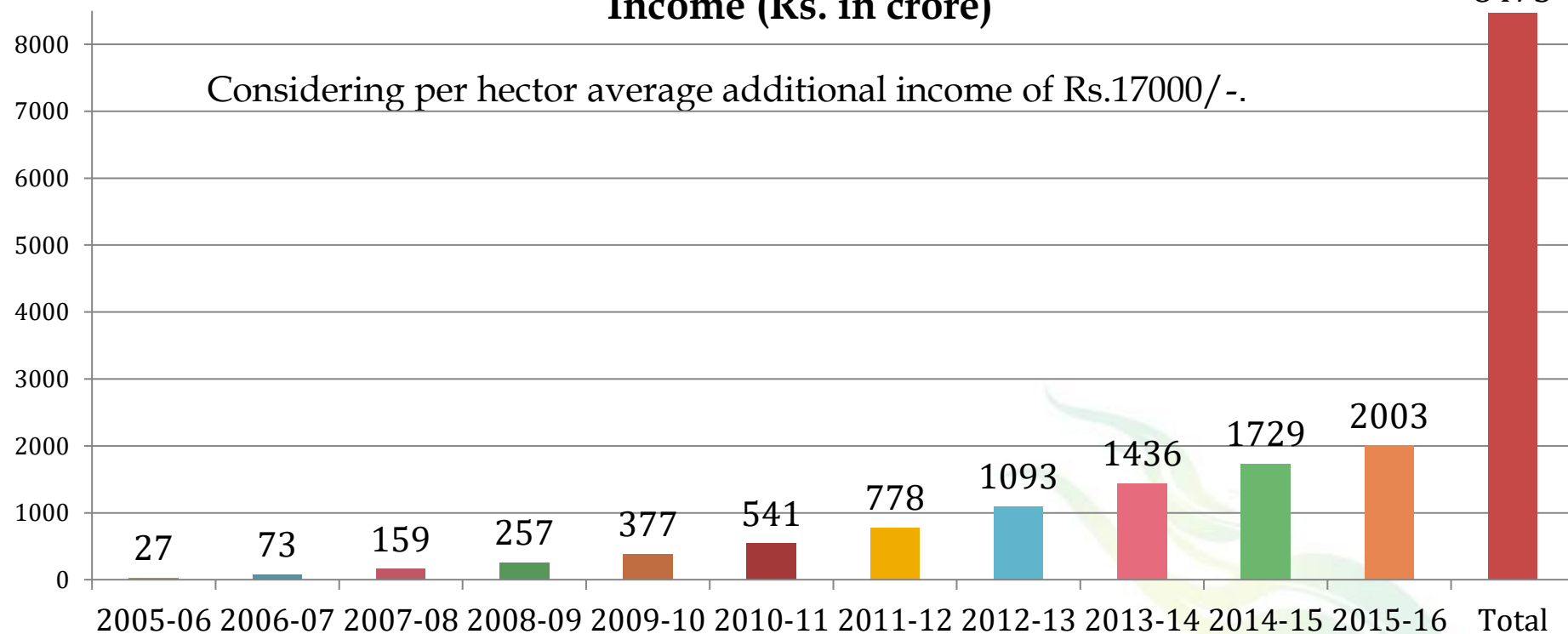
Based on the above findings, the **pay back period** for the beneficiary farmers and for the Government has been estimated at **2 cropping seasons**.





Additional Income to Farmer due to Major State Intervention in MI Scheme

Income (Rs. in crore)



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**



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.

A screenshot of a mobile application interface. At the top is a green header bar with the text 'GREM' on the left, a circular icon with 'A GPS' on the right, and a hamburger menu icon on the far right. Below the header, the screen displays the following information in a list-like format: 'Reg No : 1008-DD-35089', 'Farmer Name : Patel Chaganbhai', 'Name of Supplier : Polysil Systems', 'Village : Peplu', 'Taluka : Lakhani', and 'Distric : Banaskantha'. At the bottom of the screen, there are two green buttons: one with a white 'X' icon and the text 'CANCEL', and another with a white right-pointing arrow icon and the text 'NEXT'.

Cont...



GREM APP

MAT GROUP-HEAD

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

Functions:

- ▶ Search Item
- ▶ Check all "OK"

A screenshot of a mobile application interface. At the top, there's a green header bar with the text 'GREM' on the left, a circular 'A GPS' icon in the center, and a hamburger menu icon on the right. Below the header, the screen displays 'Reg No : 1008-DD-35089' and 'Farmer Name : Patel Chaganbhai'. A section titled 'MAT GROUP - HEAD' in blue text follows. Below this title is a search bar with a magnifying glass icon on the left, the text 'Search by item No.' in the center, and a square checkbox on the right. A list of four items is shown below the search bar: '1. Hydrocyclone Filter - 20 m3...', '2. PVC pipe 63 mm x 6 kg/cm2', '3. Fertilizer Tank - 30 Litres', and '4. Head Assembly - 2\". Each item has a square checkbox and a blue downward-pointing triangle to its right. At the bottom of the screen, there are two green buttons: '← BACK' on the left and '→ NEXT' on the right.

Cont...



GREM APP

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

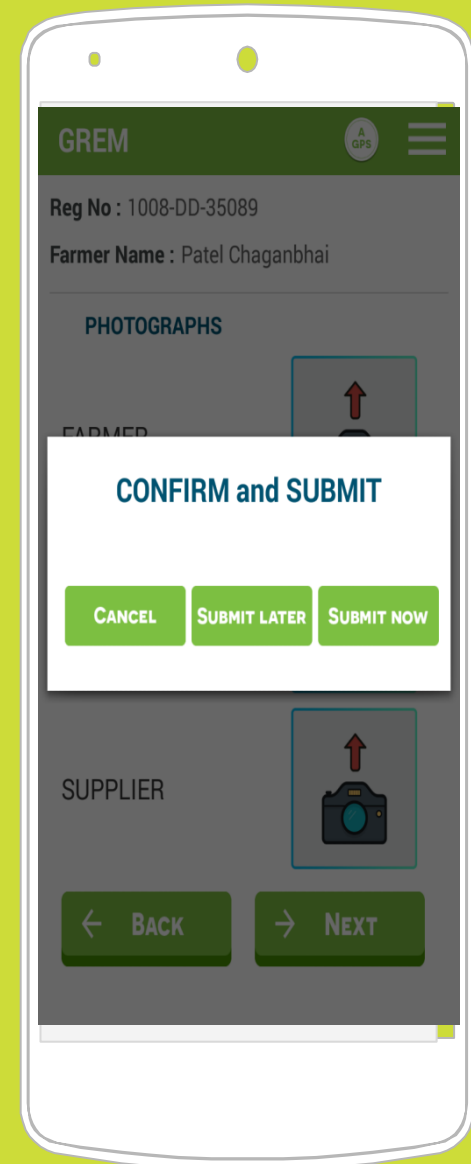
- ▶ Farmer
- ▶ Unit
- ▶ Supplier





GREM APP

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



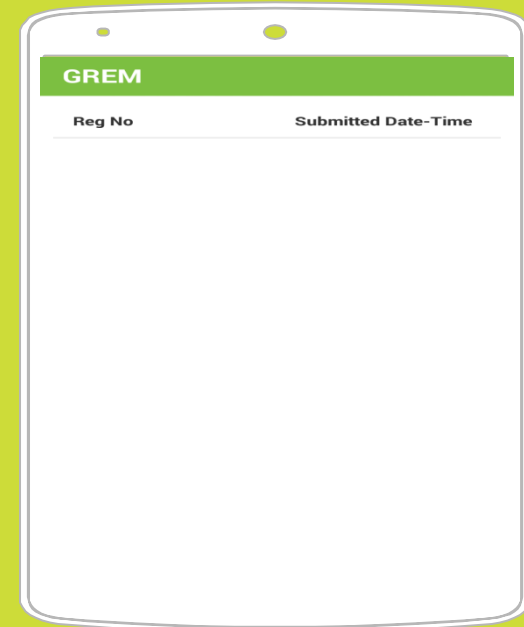
INCOMPLETE INSPECTIONS

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				

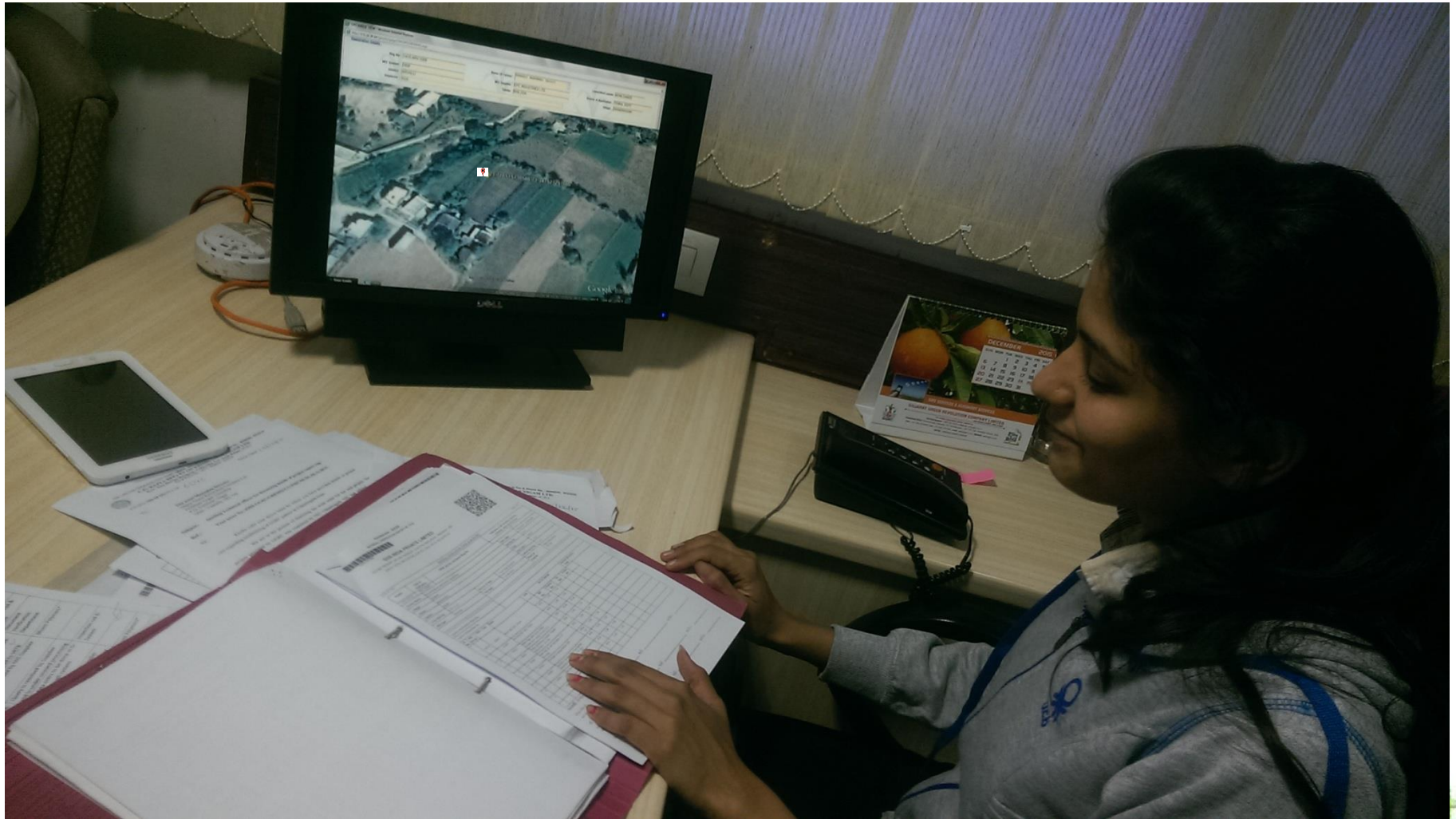
Image Details:

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



श्रीति



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...

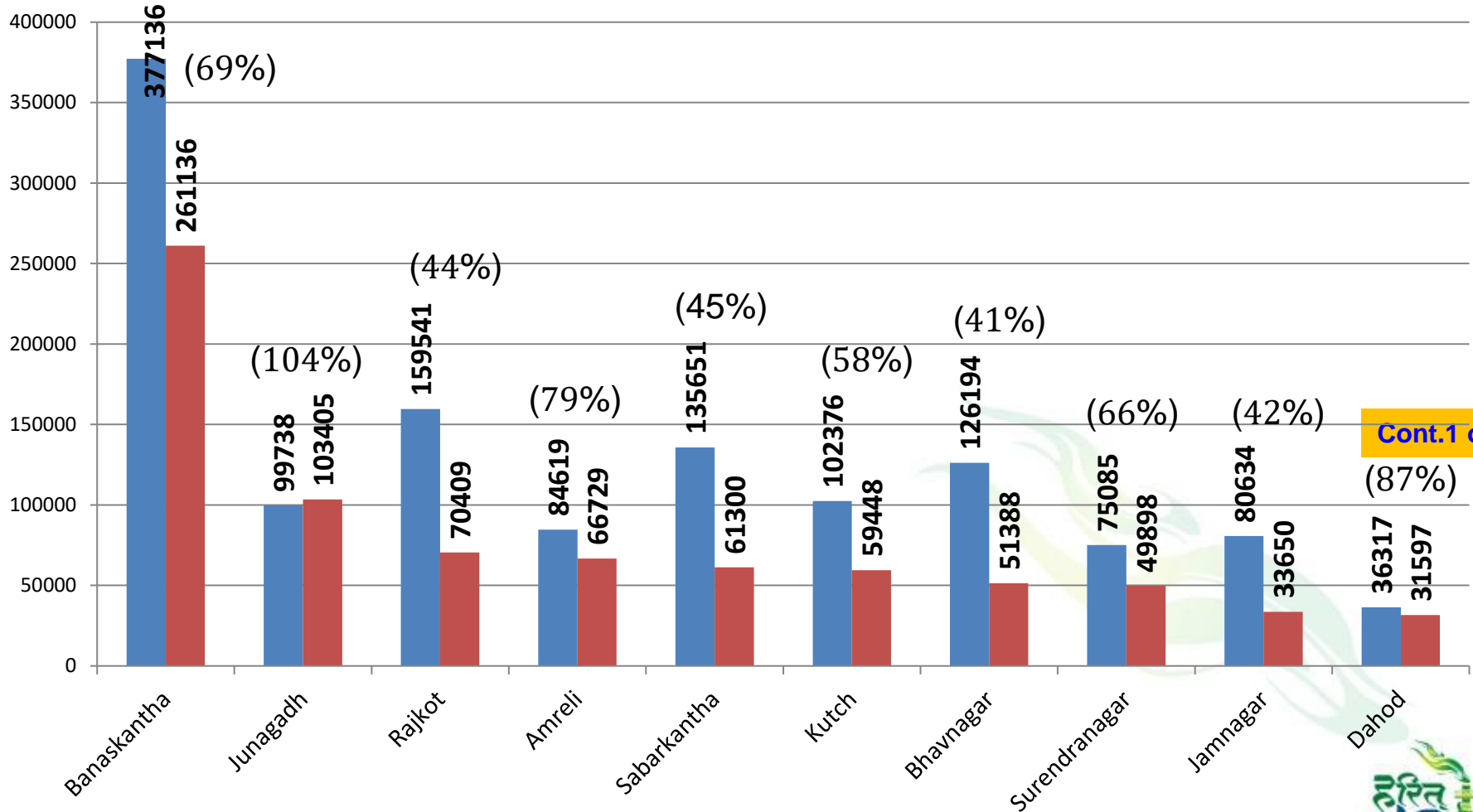


- *Inclusion of MIS in SSNNL canal command area as Pilot Project – Convergence with major irrigation scheme*
- *Dovetailing of Tribal Development Funds and MIS Scheme with the Provision of discriminatory subsidy up to 75 %*
- *Digitalization of MIS beneficiary files and records underway*
- Subsidy based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

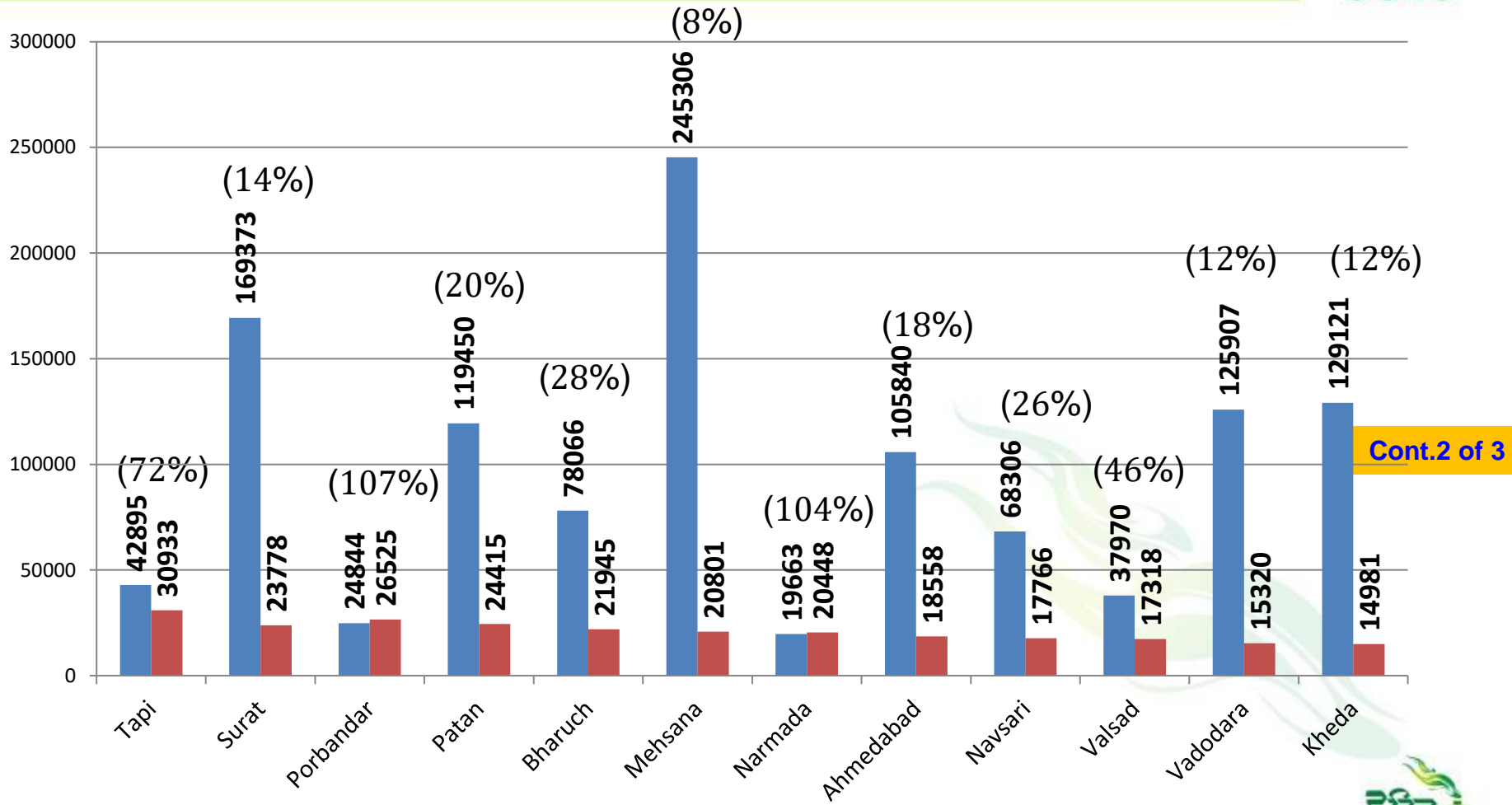
Area in Hectare



Cont.1 of 3

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

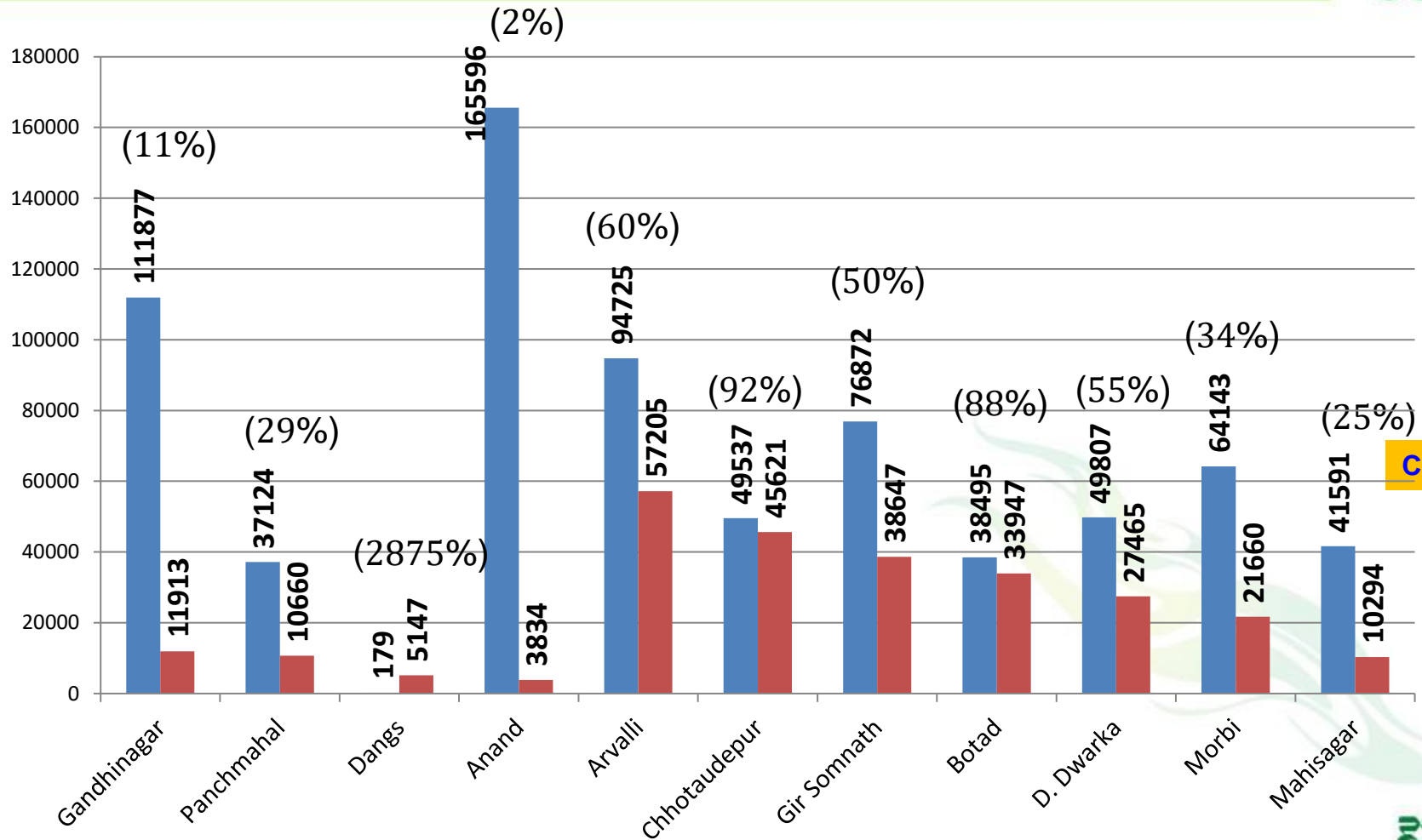
Area in Hectare



Cont.2 of 3

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

Area in Hectare



Cont.2 of 3



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



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

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%
Chhotaudepur	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

