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For years until 2000, Gujarat Electricity Board (GEB) was a drag on the government's finances and on the state's development, roundly hated by consumers and abhorred by farmers. A decade later, the same agency metamorphosed into a model public utility, efficient, agile and profitable, winning global awards for innovation and customer service. It also became the pump-primer of Gujarat's economic success - in industry, commerce and agriculture. Once perennially power-deficit, Gujarat built up embarrassing power surplus. Once abhorred by consumers, Gujarat's power utility is delighting its customers. Bureaucratic sloth has given way to technical innovation, customer orientation and a vibrant business ethic.

How did this transformation occur? And why can't its transformational processes be emulated to revitalize moribund agencies managing public irrigation systems in Gujarat and elsewhere? Irrigation systems are also utilities. They serve millions of customers. Physical characteristics of the two are similar too: a reservoir is like a power plant; canals are like transmission lines; water distribution below the outlet is much like power distribution below a sub-station. Revitalizing the management of irrigation systems can do to the state's water economy what the new-look power utilities have done to Gujarat's power economy.

This Highlight explores the lessons of the transformation in Gujarat's power sector and their relevance for revitalization of public irrigation systems.

IWMI-TATA
Water Policy Program

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HIGHLIGHT

**Organizational Reform in
Gujarat's Electricity Utility**

**Lessons for Revitalizing a
Bureaucratic Service Delivery Agency**

**Tushaar Shah, Madhavi Mehta,
Gopi Sankar and Shankar Mondal**

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ORGANIZATIONAL REFORM IN GUJARAT'S ELECTRICITY UTILITY LESSONS FOR REVITALIZING A BUREAUCRATIC SERVICE DELIVERY AGENCY ¹

Research highlight based on by Sankar and Mondal (2010)²

In 2000, and for years earlier, GEB was a drag on the government's finances and on the state's development, roundly hated by consumers and abhorred by farmers. Corruption, bureaucracy, sloth, losses, accumulated debt, political brinkmanship - all combined to bring it on the verge of bankruptcy.

In 2010, the 'GUVNL³-group', an unbundled GEB-reincarnate, comprising seven interlocked companies, is a model public utility, winning several global awards for innovation and customer service. It is efficient, agile and profitable (Madhavan 2012). It is also the pump-primer of Gujarat's economic success - in industry, commerce and even agriculture. Once perennially power-deficit, Gujarat has built up embarrassing power surplus. Once abhorred by consumers, Gujarat's power distribution companies (DISCOMs) are delighting their customers, if a 2009 Indian Institute of Management, Ahmedabad (IIMA) survey of 6000 rural households, 2000 farmers, 2000 micro, small and medium enterprises (MSMEs) and 500 villages is any guide (Morris et al. n.d.). Bureaucratic sloth has given way to technical innovation, customer orientation and vibrant business ethics. It has still some way to go before it reaches global benchmarks; but few doubt that the GUVNL-group has what it takes to get there.

Gopi Sankar and Shankar Mondal, two students of IRMA, set about exploring the anatomy of this magical transformation. In this brief, we summarise their work and explore its lessons for public utilities in India, even within Gujarat, such as its irrigation department, which are all in need of similar transformation.

ALL-ROUND TURNAROUND

GEB was among the worst performing power utilities among all Indian states in 2000. In the subsequent decade,

however, a slew of reforms and restructuring - including unbundling of the monolithic GEB into a family of four distribution companies, a transmission company, a generation company and the GUVNL as the holding company holding the flock together - has led to a dramatic turnaround in the state's power sector. By 2005, a CRISIL-ICRA comparative study had already declared the 'GUVNL-group' to be the second best performing state power utility in the country, nominally behind Andhra Pradesh. Its cash collections increased; the cost to serve, aggregate technical and commercial (AT&C) losses and farm power subsidies (the bane of state power utilities) declined; the proportion of power paid for increased sharply; losses were wiped out and the GUVNL-group began making modest book profits and significant cash profits (Tables 1-4). More importantly, the GUVNL-group also emerged as an award-winning service organization with drastic improvement in power quality, 24 x 7 three-phase rural power supply, sustained decline in transformer failure rates as well as System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI), suggesting improved reliability of power supply. Its policy of intelligent rationing of high quality power supply to agriculture by separating agricultural and village feeders under the *Jyotigram Yojana* (JGY) drove agricultural growth at 10+ percent /year over the decade (Shah et al. 2009). Abundant and reliable power supply attracted record investment flows in the manufacturing sector. A large scale survey of rural electricity consumers by IIMA suggested high level of consumer satisfaction: "Farm outputs have risen sharply over the period due to both increases in yield and area... The increase in enterprise and establishment activities is strongly dependent upon the JGY related factors. Overall per capita household incomes have grown at rates between 8 and 9 percent per

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²This report is available on request from p.regghu@cgiar.org

³Gujarat Urja Vikas Nigam Limited

annum over the period since the JGY. The use of electrical gadgets has gone up substantially... there has been a sharp decline in the use of coping gadgets such as back-up equipments, and an enhanced use of value adding gadgets - refrigerators, television etc... intangible costs of dealing with electricity staff, higher quality of supply and impact on output and income has been positive and significant..." (Morris et al. n.d.).

HOW DID GUJARAT DO IT?

The story of how Gujarat achieved such a comprehensive turnaround of the GEB has been told by many scholars and journalists. During the 1990s, international financial institutions and power experts popularized a formula for power sector turnaround which included unbundling of generation, transmission and distribution into corporatized utilities, a stand-alone transmission utility, competition in power retailing, open access to transmission network on transparent terms, and an independent regulator. Orissa bought wholesale, and somewhat uncritically, into this model in the early 1990s; it privatized DISCOMs, metered all, including farm consumers and promoted Village *Vidyut Sanghas*. Years later, Orissa reforms seem to have come virtually unstuck.

Gujarat also followed the template but adapted it to its socio-technical reality. GEB was unbundled, but DISCOMs were not privatized, nor was open access allowed in transmission. Power purchase was centralized, and the new GUVNL-group was flagged off with a clean balance sheet; all their outstanding debt was converted into equity of some Rs. 11463 crores⁴ that the Gujarat government bought into. Politicians were replaced by bureaucrats and professionals on the Boards of GUVNL as well as constituent units. Along with unbundling came real decentralization of authority and decision making to constituent companies, each with its own corporate office and a professional board. The 'template' advocated metering all consumers, including tube well irrigators; the GUVNL-group rewired Gujarat's countryside to separate agricultural feeders to ration power supply to farmers whereas *Jyotigram* feeders provided 24 x 7 three-phase power supply to non-farm rural customers, a first anywhere in India.

The late Girish Sant, a prescient student of the Indian power sector, used to argue that the power sector crisis in India is an amalgam of three crises: poor techno-managerial performance, low viability and capital adequacy, and poor governance which includes theft,

corruption and vandalism (PRAYAS Energy Group 2012). The GUVNL turnaround was the result of all-round improvement in employee productivity (Table 1), in techno-managerial performance matrix (Table 2) and overall business performance (Table 3). Farm power subsidies, the millstone around the neck of DISCOMs - have not only been reined in but agricultural demand has actually helped flatten the load curves of Gujarat DISCOMs (Table 4).

LESSONS

The failure of Orissa power reforms reveals flaws in the template (Haldea 2001). In contrast, the success of Gujarat's power sector reforms is often poorly understood. In figuring out how to push power reforms, what dominates discussions are 'silver bullets': international financiers often push unbundling and corporatization as one; Government of India's Restructured Accelerated Power Development and Reform Program (R-APDRP) promotes modern Information Technology Enabled Services as the silver bullet that will turnaround power utilities. Many states treat rural feeder separation as a silver bullet.

According to the report by Sankar and Mondal (2010), which inspired this Highlight, the transformation of GEB 2000 into the GUVNL-group 2012 took more than silver bullets; it is the combined result of a multi-pronged change management strategy. Five lessons stand out.

1. Positive Agenda and Creative Tension

The GEB turnaround project was driven by a positive agenda of excellence in service provision. A new brand of politics - paraphrased later as 'Good Governance = Good Politics', was field-tested by a new leadership intent on building mass support around a developmental agenda. This is evident in the rural feeder separation initiative. Most states today view it as a way to control farm power subsidies but Gujarat originally pushed feeder separation to provide 24 x 7 three-phase power supply to rural non-farm customers. Similarly, many view farm power rationing as a way to curtail power subsidy to irrigators. The GUVNL-group views it even today more as a load management strategy (GUVNL 2010).

2. The Proverbial Political Will

Much of the GEB turnaround project would have petered out had the DISCOMs proved unable to act on power theft. Gujarat's political leadership led from the front in

⁴ One crore = 10 million

Table 1 GUVNL-group: Soaring employee productivity

	2000-01	2005-06	2010-11
Turnover/employee (Rs. in millions)	1.23	2.17	3.76
Profit before tax per employee (Rs. in millions)	(0.5)	0.05	0.14
Number of consumers/employee (in millions)	13.9	18.1	22.0
Energy supplied/employee (million kWh)	0.62	0.98	1.07

Table 2 GUVNL-group: Techno-managerial performance

	2000-01	2005-06	2010-11
Plant load factor of GUVNL group plants (percent)	66.7	68.0	79.0
Number of sub-stations	705	841	1190
Transformer failure rate (percent)	na	18.5	13.6
Transmission lines (ckt-km)	30266	35169	41695
AT&C losses (percent)	37.7	26.5	20.7
Revenue collection as percent of demand	96.2	100.6	100.0

overcoming this Herculean task. Local politicians as well as GEB staff had, for years, got used to winking at, even colluding in, power theft. There was uproar when the electricity police filed criminal cases against over one lakh alleged power thieves. The Chief Minister, in charge of Energy, and his deputy held fast against an avalanche of pleas and threats from their party ranks. The latter once preferred to pay off dues on behalf of power thieves in his own village rather than let down the DISCOM staff. Instances like this were big morale boosters for honest DISCOM staff whose ranks now swelled.

3. Managerial Leadership

The other major contribution of political leadership was to appoint the senior-most and best generalist-administrators to the top management of the unbundled utilities. These

Table 3 GUVNL-group: Business performance

	2000-01	2005-06	2010-11
Average cost of purchase (Rs./kWh)	2.59	1.99	2.55
Average cost to serve (Rs./kWh)	3.51	3.43	4.41
Average realization (Rs./kWh)	2.7	3.49	4.52
Average margin earned (Rs./kWh)	(0.81)	0.06	0.11
Profit after tax (Rs. in millions)	(25430)	2030	5330

Table 4 Total agricultural power demand and supply

	2000-01	2010-11
Total agricultural connections	581494	845740
Power supplied to agriculture (million kWh)*	15489	13285
Power consumption/tube well (kWh/year)	26636	15708

* Source: TNN 2012

utilities were able to excel because performance demands made on them by political bosses were matched by the performance support the bosses gave them. The managerial leadership of the GUVNL group implemented the turnaround project as a process that entailed the following:

- **Resistance management:** Worldwide, employees offer the strongest resistance to organizational change. GEB was no different. Through relentless and purposeful information, education, communication (IEC) work, by evolving win-win solutions to issues raised by staff unions, and by creating incentives for change, the managerial leadership was not only able to overcome employee resistance but enlist most as partners-in-change.
- **Internal and external communication:** Critical to the change management strategy was intensive and regular communication from the leadership to all staff and stakeholders reminding them about the goal, how the organization was progressing and how the staff and stakeholders could contribute to it.

- **Superior housekeeping:** In the initial years, the leadership launched a sustained campaign to “increase revenues with a vengeance and cut costs with the passion of an entrepreneur,” to improve the finances by cutting transmission and distribution (T&D) losses, flab and theft, and reallocating resources. For instance, constant improvement in housekeeping was evident in the falling cost of power purchase, from Rs. 2.59/kWh in 2001 to Rs. 1.81/kWh by 2006.
- **Transforming work culture:** The GUVNL-group invested heavily in training and capacity building of all staff from CMD to the lineman. The focus was not only on tasks or skills but on a broad range of competences. Dinky work places and offices got a facelift. Financial power and decision making, earlier concentrated at top levels of a vertically integrated behemoth, was decentralized, empowering junior-most field staff; competition among DISCOMs contributed to galvanizing employees around corporate goals; a culture of performance management around key performance indicators (KPIs) enhanced staff participation.
- **Technology adoption, adaptation and innovation:** Technology adoption in many other state power utilities is often externally induced. The GUVNL-group adopted *e-Urja*, an Enterprise Resource Planning (ERP) platform, and promoted it to the lowest levels of the organization aggressively to inculcate a strong Information and Communications Technology (ICT) culture. Maharashtra and Andhra

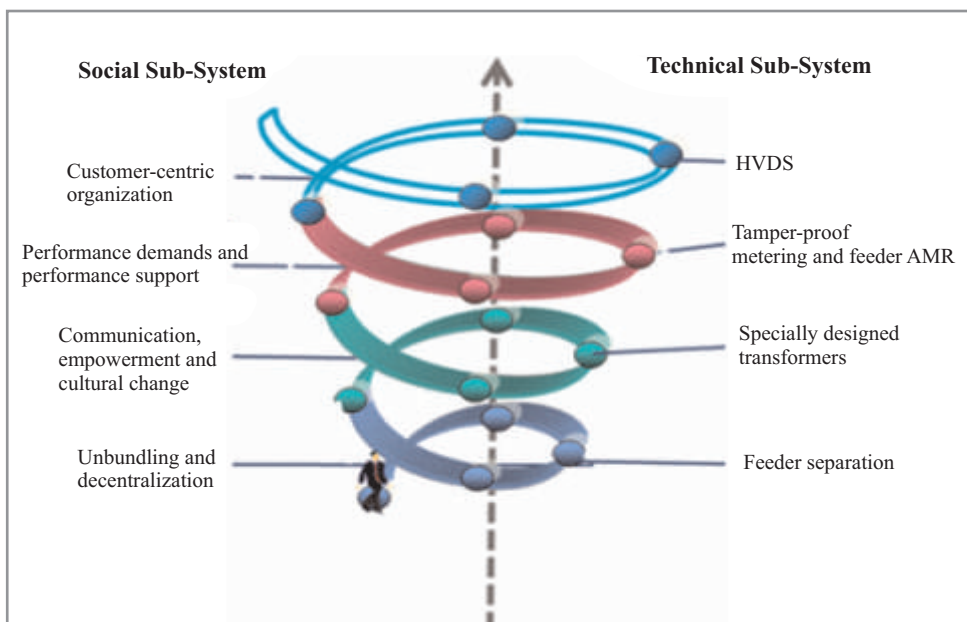
Pradesh had tried feeder separation and had given up; but the GUVNL-group not only made a success of it but also rewired all 18000 villages in a campaign made in record 1000 days at a fraction of the capital costs that other states are investing in donor-financed feeder separation programs. Innovation in GUVNL-group was in a problem-solving mode: when farmers on agricultural feeders began running irrigation pumps illegally on a single phase supply, its engineers developed a special transformer to stop the practice. The GUVNL-group constantly pilots new technologies but scales up only those that 'fit' the local context.

4. Driving Internal Change as a Socio-Technical Process

The fourth lesson from the GEB-turnaround project is the criticality of matching organizational development with technological sophistication. Since 1990, the Indian power sector has been a minefield of failed experiments of forcing cutting-edge technologies on moribund bureaucracies. Often, overlooked in the design of such interventions is the fact that it is the interaction of social (for example, employee morale, capacity, motivation, organizational culture and processes) and technical factors (improved transformers, smart cards, High Voltage Distribution System (HVDS), etc.) that creates the conditions for success or failure. Expensive and sophisticated Automatic Meter Readers (AMR) fall into disuse without transforming the capacity and attitude of ground staff, as has been evident in Haryana and West Bengal. Separating agricultural feeders will not help

unless there is organizational commitment to solve new problems arising from feeder separation. Metering farm connections or the use of smart cards is futile without, for example, first mobilizing to abolish direct 'hooking' to power lines. The sync between organizational development and technical change is an important driver of performance improvement in the GUVNL-group.

Figure 1 Transformation of GEB



5. Driving External Change as a Socio-Technical Process

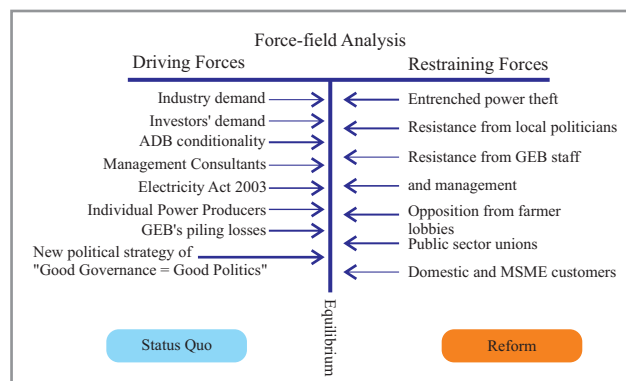
The transformation of organizational work culture would, by itself, have helped little in turning around the GEB without transforming the 'consumer culture' of theft, vandalism, political brinkmanship and hooliganism towards DISCOM staff. Political backing was necessary but not sufficient to control the anarchy below the sub-stations. The DISCOM staff members were reluctant to venture into villages for fear of violence from irate mobs. They were often taken hostage and kept in bondage. So 500 retired army personnel were hired and pressed into service to keep violence in check. Over 2 million connections have been verified and checked every year and thousands of offenders were disconnected, sued and reconnected only after recovering penalty. It took a decade of sustained campaign to control the culture of rampant power theft. Yet, Gujarat DISCOMs have to constantly introduce technologies to outsmart power thieves. To curb farmers stealing power from single-phase supply by using phase-splitting capacitors, DISCOM engineers designed special transformers that trip whenever the load exceeds a limit. HVDS improves voltage and reduces trips but also makes it hard to hook lines on the cables. A transformer-per-customer improves voltage but also makes it difficult to draw more power than registered load. Gujarat is the only state that promotes drip irrigation for saving energy and water. Again, technical change in sync with organizational change has been the secret of effective reforms. Power utilities in many other states have used modern technology as a 'fix' but without success. Some utilities have fixed expensive AMR devices on tube wells; but without accompanying organizational change, these devices fell into disuse. Many utilities have AMR at the feeder level but only a few such as in Gujarat use it for energy accounting and audit. West Bengal introduced tube well meters for remote reading, and farmed out meter reading to a private company. The company had a dispute, and meters have not been read for over three years now.

IS THE GEB TURNAROUND REPLICABLE?

The big question is can these lessons be applied to power utilities elsewhere and other utilities within Gujarat. Sankar and Mondal studied the GEB turnaround to understand if the same principles could turnaround Gujarat's irrigation department into a High Performing Service Institution (HPSI). The similarities are striking between the power and the irrigation systems; the latter has a reservoir (the generation plant), a canal system (the transmission lines), a distribution system (the distribution system) and thousands of customers. Like the power consumers in 2000, the irrigators too are a discontented

lot. The GEB turnaround can be replicated in say a large irrigation system. However the problem is how to jump-start an irrigation management reform process. In power utilities, inefficiency and poor management show up in their balance sheets. Irrigation systems, even large ones, do not have balance sheets nor are they benchmarked for performance. Power utilities need a revenue stream to do 'business' with suppliers for coal or gas for feedstock, and banks to borrow capital. Irrigation systems, once completed, have little variable cost and therefore carry on for years without a revenue stream, with government subsidies. Ushering management reform in irrigation systems requires a strong champion, who can overcome the resistance to change and impart traction to the change process.

Figure 2 Force-field analysis: GEB's transformation



Sankar and Mondal probed the GEB change management project using Curt Levin's force-field analysis which argues, "An issue is held in balance by interaction of two opposing sets of forces - those seeking to promote change (driving forces) and those attempting to maintain *status quo* (restraining forces)". Successful change makers constantly weaken 'restraining forces' while strengthening 'driving forces'. They 'unfreeze' the impasse, implement change and then 'refreeze' the change-setting at a higher level of performance. Figure 2 summarises the 'driving' and 'restraining' forces for GEB change project in 2000, with the thickness of the arrows suggesting their perceived strength. Sankar and Mondal found that GEB staff and their unions, other public sector employee unions, politicians, consumers, farmers and even management were all opposed to drastic change that power sector professionals, consultants, industries, private power producers, central government and international financial agencies demanded.

What tipped the balance in around 2000? It was a new political leadership compact in search of a new brand of politics for building mass support. In a pragmatic manner, it went about weakening or neutralizing 'restraining

forces' without taking undue political risks. A powerful change-restraining force was the general apprehension about DISCOM privatization and the employees' fear of retrenchment and dislocation. The government overcame this by persuading Asian Development Bank (ADB) against privatizing DISCOMs. It also neutralized employee apprehensions by signing a tripartite agreement among the GEB management, employee unions and the state government that working conditions would be no worse, that no jobs would be shed nor any employee relocated without consent. Starting the new entities off with a clean balance sheet also made financial sustainability of the new structure achievable. While overcoming these 'restraining forces', the management of the 'GUVNL-family' set about strengthening the 'driving forces'. The implementation of *e-Urja* became instrumental in cultural change and employee empowerment; better pay, working conditions and performance-based incentives improved employee motivation; improved power supply conditions in rural and urban areas and to industries won new friends for change process. *Jyotigram* proved a political master-stroke and went a long way in boosting employee morale and consumer satisfaction. Farmers, the formidable opponents of change, turned supporters when improved voltage and decreased tripping drastically cut their maintenance and repair costs and improved irrigation despite the rationed power supply. Power thieves and their political backers proved the most enduring change-blockers; this alone could have wrecked the change project. In neutralizing these, the sterling role of the Chief

Minister, the Energy Minister and top management cannot be overemphasized.

Electricity utilities in other states can emulate most of what Gujarat did; but it may all come to naught without the top leadership's unstinting support in controlling the anarchy at the feeders. Irrigation departments, in comparison, have fewer and weaker 'change restrainers'; as a result, these can transform themselves more easily as service providers. To initiate the change process, irrigation department leaders need to: [a] establish key performance parameters - in terms of service provision, irrigation service fee recovery, water use efficiency - at the level of the department, the irrigation system and its components; [b] establish a real-time monitoring system to track performance along these parameters; [c] evolve a system of regular communication to win over support of staff as well as stakeholders to make success of the change management; [d] invest in staff capacity building and reorientation; [e] introduce technological changes appropriate to the institutional setting; and [f] create a culture of customer service at all levels of the organization.

For political leaders, the key lesson of GEB turnaround is that anarchy control - which is centrally about good governance - faces short-term hiccups from entrenched interests but produces a larger rally of support in the medium term, provided visible gains are offered to all sections of society.

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The IWMI-Tata Water Policy Program (ITP) was launched in 2000 as a co-equal partnership between the International Water Management Institute (IWMI), Colombo and Sir Ratan Tata Trust (SRTT), Mumbai. The program presents new perspectives and practical solutions derived from the wealth of research done in India on water resource management. Its objective is to help policy makers at the central, state and local levels address their water challenges – in areas such as sustainable groundwater management, water scarcity, and rural poverty – by translating research findings into practical policy recommendations. Through this program, IWMI collaborates with a range of partners across India to identify, analyze and document relevant water-management approaches and current practices. These practices are assessed and synthesized for maximum policy impact in the series on Water Policy Highlights and IWMI-Tata Comments.

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