Kick-starting a Second Green Revolution in Bengal

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Two decisions taken by the Government of West Bengal, one, to facilitate easier extraction of groundwater, and the other, the application of a fixed connection fee for an electricity connection to farmers could well lead to a quantum leap in agricultural production.

Late last year the Government of West Bengal took two policy decisions not widely publicised by the media or commented upon by the academia. They are decisions which will change the lives of millions of small and marginal farmers in the state by improving their access to groundwater and in the process may as well kick-start a new green revolution.

First, the Water Resources Investigation and Development Department (WRIDD), vide a memo dated 9 November 2011, changed a provision of the West Bengal Groundwater Resources (Management, Control and Regulation) Act 2005. Now farmers located in 301 or so “safe” groundwater blocks and owning pumps of less than 5 horsepower (HP) and tube wells with discharge less than 30m$^3$/hour will no longer need permits from the State Water Investigation Directorate (SWID). This will effectively put all farmers except those located in 37 semi-critical blocks outside the purview of the Act. Earlier, farmers needed these permits to apply for electricity connections from the West Bengal State Electricity Distribution Company Limited (WBSEDCL). This process of procuring SWID certificates was fraught with rent-seeking and corruption and at the receiving end were small and marginal farmers.

Second, the WBSEDCL on its part has also passed a policy resolution by which it will give new electricity connections to farmers against a payment of a fixed connection fee ranging from Rs 1,000 to Rs 30,000 per connection depending on the connected load. This means that farmers will no longer have to individually pay the full cost of wires, poles and transformers based on the distance from the network, as they were required before. But through a uniform connection fee, the utility will still be able to cover the full cost of new connection on an average. The farmers will also continue to pay a metered tariff for their electricity consumption – a tariff that is unsubsidised and indeed a little higher than average cost of supply.

Why Are These Changes Important?

In order to understand the full implications of these two policy changes, we need to understand agriculture, groundwater and electricity situation in West Bengal and how it is different from the dominant discourse of over-exploitation and scarcity that we often read about (Janakarajan and Moench 2006; Moench 2007; Sarkar 2011; Mukherji 2006). After posting impressive agricultural growth rates of 6% and above per annum in the late 1980s and early 1990s (Saha and Swaminathan 1994), West Bengal’s agricultural growth has stagnated at 1-2% per annum since then (Sarkar 2006). Production of summer boro paddy is showing a declining trend. While the costs of cultivation (especially irrigation costs) have increased several times, the market price of paddy has either stagnated or risen less steeply than the cost of production – thereby hurting farmers’ profit margins. For example, from 2000 to 2008, the index value of cost of labour and fertiliser has gone up from 100 to 136 and 115 respectively, while irrigation costs have increased from 100 to 223 at 1999-2000 constant prices. High irrigation costs are a direct result of farmers’ dependence on expensive diesel for pumping groundwater and low rates of electrification in the state.

Low Rates of Pump Electrification and Groundwater Utilisation: West Bengal has the lowest rates of pump electrification for irrigation in the country. Here only 15% of pumps run on electricity as against a national average of 67% (GOI 2011). The WRIDD memo recognises that an SWID permit was one of the key reasons for low rate of pump electrification. This is also confirmed by several other studies (Mukherji 2007) and by a recent survey by the International Water

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Management Institute and Delhi School of Economics (IWMI-DSE 2010 survey, Meenakshi et al 2011). This memo also recognises that groundwater utilisation in the state is only 42% of its potential and less than 10% of the blocks are in a semi-critical stage of groundwater development and therefore there is scope for further groundwater development. Before this new order came in, it was usual for swid officials to reject up to 60-75% of all applications for a permit even in safe groundwater blocks without citing any reason. For example, till September 2010, some 23,000 farmers had applied for permits and only 8,500 got them. That this process was fraught with rent-seeking and corruption was openly acknowledged by groundwater officials in the state.

The IWMI-DSE 2010 survey found that a majority of the farmers who did not own electric pumps cited the cumbersome SWID certification process and high capital cost of tube well electrification as the main reasons for opting for electric tube wells, even though operational cost of such electric pumps are a fraction of diesel pumps. Quite predictably, the number of new electricity connections for tube wells had fallen drastically over the years (Figure 1). Indeed, West Bengal has the lowest number of electric pumps in India – lower than the adjoining states of Bihar (18%) and Orissa (27%) and much lower than in Punjab, Andhra Pradesh and Karnataka even though overall groundwater endowment per unit of land is much higher.

**Dieselisation of Irrigation Economy and High Costs of Cultivation:** Lack of access to electricity pushed farmers to use diesel tube wells for irrigation – even at the cost of ever declining profit margins due to high diesel prices and stagnant output prices. This affected boro cultivation. Boro paddy is one of the most profitable crops in Bengal and is therefore a preferred crop of farmers. It was a rapid increase in area and production of boro paddy in the 1980s and early 1990s that unleashed the green revolution in West Bengal (Harriss 1993; Palmer-Jones 1995). Since 2001, according to government data, the area under boro paddy has remained constant at 14 lakhs hectares, though remote sensing data shows that this area has declined substantially from 2001 to 2007 and recovered somewhat in 2010. While data on actual area under boro paddy is debatable, what is quite clear is that farmers with electric pumps have much lower cost of cultivation than farmers who depend on diesel pumps – even though electric pump owners are metered and charged full cost of supply of electricity. A similar energy squeeze has been experienced by farmers in other eastern states like Bihar (Shah 2007). This is in contrast to several other states in India like Punjab, Karnataka and Andhra Pradesh where farmers are given free electricity and the electricity utility is in turn compensated by the state government for providing free electricity to farmers.

**Contraction in Groundwater Economy:** The overall impact of these two restrictive policies was a reduction in the number of groundwater wells from 6.48 lakhs in 2001 to 5.19 lakhs in 2006 (goi 2001 and 2011). This is a paradox given that the same minor irrigation census shows that in 80% of the villages, groundwater is available within less than 10 m. Groundwater data provided by swid shows that groundwater levels recover sufficiently after the monsoon season due to high rainfall and alluvial nature of the aquifer (Figure 2, p 29). If there is any place in India where groundwater can be deployed as a poverty alleviation tool without significant impact of long-term sustainability of the resource, it is in these water-rich areas like West Bengal. Indeed, there is adequate evidence to show that higher the

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level of abstraction in the pre-monsoon season, higher is the net recharge in post-monsoon season; intensive groundwater use may actually have positive externalities. This is often called the Ganges water machine hypothesis (Revelle and Lakshminarayana 1975).

Can Electrification of Pumps Unleash Agrarian Growth? The net impact of these two new policies will be an increase in number of electric pumps in the state. There is indeed a large scope for an increase. According to the Central Electricity Authority (CEA 2010), the state had a total of 1,16,343 electrical pump sets as on 31 March 2010 against a potential of 6,50,000 pumps. West Bengal’s agrarian growth has been stagnating since the early 2000s. Can these new policies trigger a new phase of agrarian growth? Using secondary data from agricultural censuses and the 54th round of NSSO (NSSO 1999) coupled with primary data and by making some fairly simple assumptions, we provide a rough but realistic estimate of the impacts of electrification of pumps.

Let us assume that as a result of these two policies, 50% of existing pumps are electrified. The number of electric pumps will increase from roughly 1,20,000 to around 6,00,000 or very near the potential stated by CEA in three to five years. What will be the impact of the use of an additional half a million electric pumps on net irrigated area? Given that, on an average, one electric pump irrigates 7.9 hectares of land (Mukherji 2007), an addition of 4,80,000 electric pumps would lead to creation of an additional 3.7 million hectares (mha) of irrigable land. This will be more than the largest canal irrigation systems in the country which take 30-50 years and thousands of crores to complete. Assuming that only 50% of this potential will actually be irrigated, this amounts to 1.85 mha of additional irrigated area. Thus net irrigated area of West Bengal will go up from 2.98 mha as of now to 4.83 mha in a short period or three to five years. This will mean an increase in the ratio of net irrigated area to net cultivated area from 54.5% to 88% simply by electrifying around half a million pumps. Assuming average boro paddy productivity of 2.5 tonnes/ha, this will lead to additional production of 4.62 million tonnes of paddy. Assuming Rs 1,000 per 100 kg of paddy, this translates to additional income of Rs 460 crore in a year. Similarly, with addition of half a million electric pumps, the area served through water sale will increase as will the number of water buyers who are served. On an average, diesel pump owners serve 12 water buyers per year, while electric pump owners serve 38 water buyers (Mukherji 2007). Even assuming that each electric pump owner will serve only 10 water buyers, the number of new water buyers who will be brought under the ambit of water markets will be a staggering 4.7 million. Right now around 25% of cultivating households (or 1.5 million households) do not have any access to irrigation (NSSO 1999; Mukherji 2008). This scenario might as well change with electrification of tube wells in the state.

Financial Health of WBSEDCL? In most states, the groundwater economy and agricultural production have boomed
also serve the interests of WRIDD and WBSEDCL. Swid geologists were entrusted with the task of providing swid clearance to millions of small and marginal farmers in the state – a job for which they were neither staffed nor well equipped. This, quite predictably, led to rent-seeking and arbitrary decisions, thereby hurting the small and marginal farmers they were supposed to serve. Now the Swid staff will be responsible for providing permits to bulk users of groundwater (such as industries and municipalities) and this will lead to a substantial reduction in their workload. These measures also serve the interest of WBSEDCL. In West Bengal, farmers pay a metered tariff that reflects full average cost of supply. Unlike most other states like Punjab, Haryana, Karnataka and Andhra Pradesh where farmers get free electricity, farmers in Bengal do not receive any tariff subsidy. Nor do they demand any, for that matter. Therefore, for WBSEDCL, farmers are revenue paying customers as any other and they are now more than happy to increase their customer base and improve their cash flows. Finally, with ease in electrification procedure, farmers of West Bengal will be able to make intensive use of groundwater for increasing their agricultural production. This will also contribute to poverty alleviation in a state that is home to 214 lakhs of poor and of these 84% live in rural areas. These initiatives will also give concrete shape to the central government’s policy directive of encouraging food production in eastern India without compromising ground-water resource sustainability.

REFERENCES


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– but at the cost of electricity sector (Shah et al 2003). Will the same happen in West Bengal? Prima facie, it seems not, especially as long as the Government of West Bengal does not change its policy of metered supply to agriculture and charges farmers the full cost of supply keeping in mind that night-time supply to agricultural consumers is priced lower than full average cost of supply because there are no other takers of electricity in those time slots. Under the current tariff regime, farmers in Bengal are full revenue-paying customers like any other and increase in such a customer base should not affect the finances of the utility adversely. However, increased agricultural consumption brings with it its own set of challenges such as load management, monitoring of a spatially dispersed clientele, power thefts and matching electricity supply with peak irrigation demand. West Bengal can learn from other states such as Gujarat (Shah and Verma 2008) and Punjab (Mukherji et al 2011) and take proactive steps to manage the energy-irrigation nexus. Such steps may include segregation of agricultural and domestic feeders in rural areas, intelligent rationing of power supply to match peak irrigation in the summer boro season, high voltage distribution systems (hvds) for improving the quality of power supply to agriculture, etc. Until 2008-09, West Bengal was a power-surplus state, since then its generation capacity has suffered due to lack of proper upkeep of its generation capacity. This can be rectified with additional investments, which anyway needs to be undertaken for the long-term viability of the sector.

Conclusions

In this short note, we have discussed two recent policy changes by the Government of West Bengal – policies that will have a profound impact on agriculture in the state. By removing compulsory swid certification and providing electricity connections against a fixed connection fee, the Government of West Bengal has finally realigned different interests in order to serve the interests of poor farmers in the state. These policy decisions are not only pro-farmer, but

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