How Reliable are Agricultural Power Use Data ?
Paper Published in Economic and Political Weekly, April 12-18, 1997

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Abstract :
Agricultural power use is known to be a major problem in SEB's financial health. But the amount and quality of data available on this issue is grossly inadequate. Attempts to verify MSEB's claim of 20 lakh agricultural pumps (IPS) demonstrated that it cannot be done using available government data. But more serious was the revelation that even data regarding the number of wells, area irrigated, or GSDA's estimate of ground water extraction have serious problems making mockery of government planning. The paper points at urgent need to improve quality and reliability of all government data related to this issue without which the ground water and power planning has very limited relevance.

1. Introduction :
Growing number of Irrigation Pumpsets (IPS), their increasing power consumption, and large subsidy are the major issues facing the SEBs (state electricity boards) which are almost on the brink of collapse. For example, the number of IPS connections in Maharashtra is growing at the rate of 8.6% p.a. and has reached nearly 20 lakhs. In the last decade, the IPS consumption has grown at 13.4 % p.a., while consumption of all other sectors (put together) has grown at only 6.8% p.a. In 1993-94, Maharashtra SEB (MSEB) extended a subsidy of Rs. 1,127 crores to IPS consumers (Planning Commission, 1995). This subsidy was equivalent to the capital cost of 350 MW power plant, which is about half of the required capacity addition in that year.

Considering such enormous importance of IPS consumption for SEB's survival, it is striking that the data about IPS consumers available with SEBs is extremely sketchy and weak. Senior researchers have expressed serious doubts about the levels of IPS consumption reported by SEBs and the other statistics derived from this number (Reddy A K N and Antonette D'sa, 1994; Roy S. N. 1995, 1996). Former chairman of Central Electricity Authority, Mr. S N Roy, has highlighted the gravity of situation:.

"SEBs are manipulating the energy sale of agricultural sector to hide excessive T&D losses and pilferage. The agricultural consumption per kW has been jacked up three times .... despite lower availability of power due to acute shortage. .... "(1995).

Understanding the reality of IPS consumption is critically important for developing SEBs revival package and also for understanding groundwater situation. This paper is an outcome of serious discrepancies found in official data about IPS, while analysing issues such as, who really benefits from IPS subsidy and what will be the impact of tariff rationalisation. Main objective of this paper is to elaborate on the extent of discrepancy found and to initiate a discussion on how to address such issues.

The data available with various government agencies is first described, then the discrepancy in official data is shown. The impact of such discrepancy, on the vital planning issues, such as, groundwater management and irrigation is elaborated.

2 Data available with different government agencies :
MSEB, Agricultural department (AD), Irrigation department (ID) and Groundwater survey and Development Agency (GSDA) are important government agencies in relation to IPS.

MSEB Data : Compiled data available with MSEB includes 1) Number of IPS energised each year, 2) Connected load of these IPS (based on the user's application form, and not actual measurements), and 3) Number of IPS with metered tariff and with HP based tariff.

MSEB has not compiled following vital data even though it collects this information while sanctioning the IPS connection : 1) Water source wise (Wells / surface sources) number of IPS, and 2) HP wise distribution of IPS.

While sanctioning connection, MSEB seeks information regarding water source for the IPS. At the time of connection, farmers having IPS on surface source have to produce a 'water lifting permission' from government department. In case of IPS on well, farmer has to produce the proof of irrigation well, based on entry in the 7/12 form with the Talathi. But MSEB does not compile this data. Moreover, MSEB has no procedure to identify IPS not in use. Discussions with MSEB engineers revealed that, MSEB rarely receives applications for IPS disconnection. Farmers not using IPS probably stop paying the bills. Hence, it is not possible to estimate the number of defunct IPS from MSEB data.

Data available with AD : 'Crop and Season Report' published annually and Agricultural Census carried out every five years are major sources of data from AD. This information is based on Talathi records. Following data is available from these sources.

- district-wise information on number of irrigation wells,
- IPS on wells
- area irrigated by wells
- area irrigated by different sources; such as canals, wells, tanks and other sources; and
- analysis of such data by land holding sizes.

Most important shortcoming in the AD data is that it does not compile water source wise cropping pattern i.e. Crop pattern of area irrigated by wells and area irrigated by IPS on rivers etc.

Data available with GSDA : For number of irrigation wells data, the GSDA relies on data collected by the AD, which is based on Talathi records. When contacted, GSDA could give the number of irrigation wells only as of 1987.

Data available with ID : For the use of surface water, permission of state government is essential. The ID issues water lifting permission on 'notified rivers'. For non-notified rivers, the permission is given by Revenue department. In 'Command Area Development Authority' (CADA) areas, CADA issues such permission. It has been pointed out that, there is no uniformity in the format of water lifting permission (NABARD 1991, p31). The number of such permissions granted by different agencies is not reported or compiled by any nodal agency. The ID compiles information only in terms of total water lifting allowed on different tributaries. This information could not be obtained even at the district or the circle level.. Thus, it is not possible to arrive at the number of IPS "operating" or "authorised to operate" on surface water sources in the state.

Data available with other government agencies and reports :

- Apart from small surface lifts, many large co-operative lift irrigation schemes (LIS) operate in the state. Data on these co-operative LIS, such as, number of co-operative lifts, potential and actual area irrigated, membership, etc. is compiled by the Directorate of Co-operatives (DC). But the data on connected load and cropping pattern are not compiled by the DC.
- A report of Minor Irrigation Census (MIC) carried out in 1987 was published in 1994 by Government of India. It gives important details such as :
  - number of IPS on wells and surface sources
  - Area irrigated by IPS on wells and by IPS on surface sources.

3 Comparison of data available with different government agencies :

Data about number of IPS on wells and surface sources is available from Report of Minor Irrigation Census (MIC). Since this data is available for only one year i.e. 1987, following table compares data from various sources for 1987.

No.	Data	MSEB	M I C	AD
1	Total number of wells in the state	-NR-	12.40 lakh	13.30 lakh
2	Total number of IPS in the state	11.28 lakh	8.69 lakh	-NR-
2 a	IPS on wells	-NR-	8.22 lakh	5.7 lakh
2 b	IPS on surface water sources	-NR-	46,273	-NR-

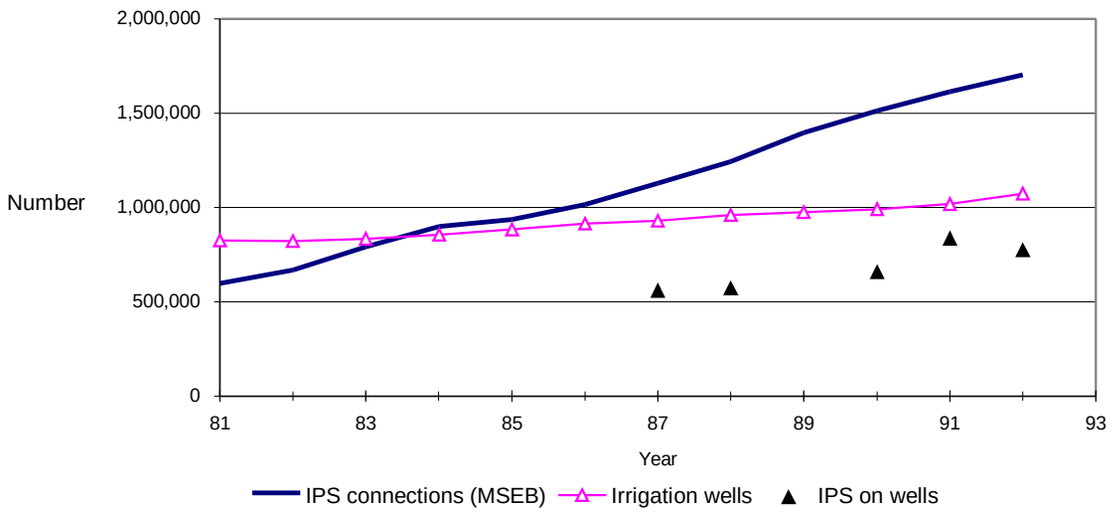
-NR- : not reported

Sources : MSEB annual report, MIC 1994, Crop and season report (AD).

It is striking to note a discrepancy of 23% (2.59 lakhs) in number of IPS reported by MSEB and MIC. It is unfortunate that AD reports only the IPS on wells and does not report IPS on surface sources. IPS on wells reported by AD are 30% (2.5 lakh) less than MIC. Hence, the discrepancy between MSEB and the AD data is even higher.

Analysis of the available time series data also highlights the discrepancy. Figure 1 shows the number of i) IPS connections as per MSEB, ii) irrigation wells, as per the AD, and iii) IPS on wells as per the AD.

Figure 1 : Number of IPS v/s number of wells and IPS on wells



Since 1984 MSEB's IPS connections are more than total irrigation wells (as per AD data). Difference between MSEB's IPS connections and the number of IPS on wells (as per AD) can be said to represent the number of IPS for surface lifts. In 1992 this leads to a very large estimate of about 9 lakh surface lifts. This can not be justified by total irrigated area in the state indicating the unreliability of data.

It can be seen that, IPS connections claimed by MSEB, are far more than the IPS installed on wells (as claimed by agricultural department). Since 1984, IPS connections by MSEB are more than even the number of irrigation wells.

The unreliability of this data could be further demonstrated through a quick exercise.
Difference between MSEB's IPS connections and the number of IPS on wells (as per AD) can be said to represent the number of IPS for surface lifts. This leads to a very large estimate of about 9.29 lakh surface lifts in 1992. Of these, 3,200 are large co-operative lifts, which irrigate 2.39 lakh Ha. (GoM, 1994, p99, p133). Hence, the number of small surface lifts can be estimated at 9.26 lakh, which is 1.2 times the IPS on wells ! The surface lifts have higher water availability than wells, and should irrigate at least 1.25 Ha. per pump. Hence, 9.26 lakh small LIS should have irrigated 11.58 lakh Ha in 1992. The co-operative LIS irrigate 2.39 lakh Ha. Hence, all IPS on surface sources should have irrigated 13.97 lakh Ha. But as per agricultural department data, the area irrigated by all surface sources (which includes irrigation department canals and tanks apart from small lifts and large co-operative lifts) was only 9.88 lakh Ha.!

4 Implications and conclusions :
Such a large discrepancy is indicative of gross unreliability of the government data. This discrepancy can arise due to combination of following possibilities :

1) MSEB's number of IPS is unrealistic : This means actual IPS in operation are far less than reported by MSEB. The AD and MSEB data has a irreconcilable discrepancy. The MIC reports figures that are some what in between these two sources. Hence, if we assume that real number of IPS in operation are correctly reported by minor irrigation census (MIC) then; 23% of IPS reported by MSEB are either disconnected or inoperative. Based on these figures, the average hours of pump operation in 1994, work out to be 1,800 hrs/year (and not 1,400 as portrayed by MSEB). The IPS operate for at most 10 months, i.e. 260 days a year (after considering officially announced non-supply of one day per week). This implies that on the average all IPS operate for 7 hours per day. Considering a large number of IPS connections in the water short areas this seems absurd.

2) The AD under-reports number of IPS on wells : GSDA's estimate of ground water extraction, is based on IPS on wells reported by AD. GSDA assumes all pumps of 3 Hp and a fixed hours of pump operation. MSEB reports average pump size of nearly 5 Hp and steadily increasing pump operation hours. Hence, assumptions by GSDA are way off the mark, implying much higher ground water extraction.

The discrepancy in the official data may be due to combination of these factors. It is not possible to arrive at the magnitude of discrepancy due to individual factors.

To establish the credibility of government claims about the (i) IPS consumption or subsidy, (ii) irrigated area in the state, crop production (hence contribution of agricultural to the state domestic product), and (iii) real level of

ground water extraction; it is essential that the government and the MSEB carries out a census of all IPS in the state.

Considering that MSEB staff is in regular touch with all IPS consumers (for maintenance, billing etc.) and MSEB's survival now largely depends on the issue of IPS power use, it is imperative that it carries out such survey at the earliest. This is not a Herculean task. As a first step, it is essential to properly estimate number of small surface lifts in the state and the cropping pattern of area irrigated by surface lifts. These estimates can throw light on number of important aspects such as real beneficiaries of subsidy, real IPS consumption, it's likely growth and the impact of tariff rationalisation on farmers. Simultaneously, MSEB should urgently evolve appropriate procedures and mechanisms to collect and compile all the relevant data. In the absence of this, a discrepancy of 20 to 40% in the official data makes a mockery of government figures and hence of government planning itself.

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Acknowledgement :

We are thankful to Prof. B D Dhawan, Dr Sulbha Bramhe, Dr Mitra for reading earlier drafts of this paper, detailed comments and encouragement. This paper is a part of PRAYAS project supported by International Energy Initiative, Bangalore.