Understanding Adaptive Policy Mechanisms through Power Subsidies for Agriculture in Andhra Pradesh, India

Sreeja Nair

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Introduction

In India, sustainability in the agricultural sector has always been a major concern; not only because there about 600 million livelihoods dependent on the sector but also to safeguard national food security. A discussion on power subsidies for the agriculture sector offers interesting insights in terms of social, economic and environmental sustainability concerns. In India, the power tariffs in the agricultural sector account for less than 10% of the cost involved in providing power to this sector. This is essentially because of substantial power subsidies that account for nearly 25% of India’s fiscal deficit. This figure is comparable to twice the amount of expenditure made by the Government of India on other critical sectors such as public health and rural development (Monari, 2002). While the agricultural sector in India consumes about 30-40 % of the power generated, it provides only 8-10 % revenues1. For most states in India, power is supplied at a flat rate to the agricultural sector, due to which the exact share of power actually consumed by the sector is often miscalculated. These flat rates have almost remained constant since the time they evolved in the 1980s. Losses on account of theft or during transmission and distribution are hence often attributed to the agricultural sector, indicating gross high power consumption by this sector. Furthermore, having flat rates on power consumption in agriculture has resulted in the over-use of groundwater resources across the country (Reddy, 2003).

Power subsidies for agriculture have been unevenly distributed among states in India. Andhra Pradesh is among the top states receiving highest subsidies per hectare of cropped land (Fan et al, 2007). With a new political party coming into power in 2004, 100% free power for agriculture was announced and implemented in Andhra Pradesh. This chapter critiques this ‘free power policy’ through the adaptive policy lens by borrowing

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insights from community-based studies in two drought-prone villages of Andhra Pradesh.

Methodology

Andhra Pradesh was selected as the area of focus for this case study because firstly, the economy of Andhra Pradesh is largely dependent on agriculture and secondly, agriculture in the state is largely rain-fed. In addition, farmers in Andhra Pradesh have small and marginal landholdings, thereby limiting their ability to cope with the impacts of climatic as well as economic changes on the agricultural sector (GoAP, 2007).

Within Andhra Pradesh, the case study sites chosen include two-drought-prone districts- Chittoor and Anantapur (Figure 1). While Chittoor district falls in a dry-sub-humid zone with an average annual rainfall of 700-1000 mms, Anantapur district falls in the scarce rainfall zone with an average annual rainfall of 500-750 mms.
Two villages were selected in each district: Katherapalli village in Chittoor district and Neramatla village in Anantapur district. Both these villages are able to cultivate throughout the year despite the region being prone to droughts. Both these villages also have high access to irrigation facilities (>66% coverage of the total households). A point of difference is that while Katherapalli has high infrastructure, Neramatla has low infrastructure (in terms of power availability, communication, banks, agriculture and cooperative societies, medical facilities, drinking water facilities and schools).

With the village case studies as supportive examples, the power subsidy policy in Andhra Pradesh is analysed to search for adaptive policy mechanisms to potentially help the policy to respond effectively to anticipated and unanticipated conditions. A policy that has the ability to adapt to anticipated conditions is built upon insights into cause-and-effect relationships. Policy mechanisms to respond to anticipated conditions include:

- **Automatic Adjustment** – Some of the inherent variability in socio-economic and ecologic conditions can be anticipated, and monitoring can help trigger important policy adjustments to keep the policy functioning well.

- **Integrated Assessment** – Through an integrated assessment of causal factors, key impacts and scenario outlooks, policies can be crafted to perform under a range of anticipated conditions, and possibly function even under worst cases.

- **Multi-perspective Deliberation** – Deliberative processes strengthen policy design by building recognition of common values, shared commitment and emerging issues, and by providing a more comprehensive understanding of cause-and-effect relationships.

The ability of a policy to adapt to unanticipated conditions is a newer notion, based on a holistic appreciation of system complexity, capacity, performance and dynamics. Policy mechanisms to respond to anticipated conditions include:

- **Formal Review and Continuous Learning** – Policy review undertaken on a regular basis, even when the policy is functioning well, can help policies deal with “emerging” issues, and trigger policy adjustments.

- **Encouraging Self-organization and Networking** – By encouraging interaction, policies can foster the emergence of innovative responses to unexpected events.

- **Subsidiarity** – By recognizing that action will occur at different levels of jurisdiction, depending on the nature of the
issue, policies can be crafted to assign priority to the lowest jurisdictional level of action consistent with effectiveness.

- **Promoting Variation** – Small-scale interventions for the same problem offer greater hope of finding effective solutions. Diversity facilitates the ability to persist in the face of change.

### Observed coping measures

Communities within Katherapalli village (Chittoor district) and Neramatla village (Anantapur district) were found to be able to cope with climatic shocks and stresses and associated risks to agricultural yields. This was primarily owing to the subsidized rates of power for agriculture for irrigation, thereby allowing for crop cultivation throughout the year. The households surveyed in Chittoor indicated that of the total cropped area, 31% is irrigated, hence allowing for crop diversification. The main crops grown in Chittoor district include paddy, sugarcane, groundnut and mango. In Katherapalli village, water for agriculture is drawn from the Krishnapuram reservoir. Following the year that water was made available from this reservoir, the region has witnessed a shift in cropping pattern from traditional less water-intensive crops (such as groundnut, bajra, jowar and pulses) to water-intensive cash crops (such as paddy and sugarcane).

Although about 52% of the total geographical area in Anantapur is cultivated, only 12% of this area is irrigated. Anantapur was largely found to be a mono-cropped area with groundnut being the main crops grown. This adds to the vulnerability of the region to price variations and other specific risks associated with monocrop cultivation. However, village Neramatla was a good example of mixed cropping in Anantapur district. This village was able to cultivate crops round the year only because of assured irrigation supply. The village is benefited by the Penna Ahobilam Balancing Reservoir constructed across the Pennar River as part of the Tungabhadra High Level Canal (HLC). The availability of water through the HLC, allows for cultivation of crops throughout the year in a drought-prone district. The main crops grown in this region include paddy, groundnut, red and Bengal gram and sunflower. Despite having low infrastructure, limited income diversification options, poor infrastructural facilities, being remote from the market, and over-dependence on agriculture, farming communities in Neramatla are able to cope with climate variability and extreme conditions due to easy access to irrigation facilities (facilitated through power subsidies) round the year.
At this point, it is important to make the distinction between short-term coping and long-term adaptive measures. Water for irrigation forms a crucial determining factor for agricultural yields and farm-based incomes. However, long-term costs (groundwater depletion, soil salinity, over-investment in pumpsets vs. efficient irrigation gear; over-dependence on crops that do not use water efficiently, leading to distortions of agricultural markets; lack of inputs or infrastructure to support agricultural innovation) can make the farmers more vulnerable in the long run.

**Policy description**

Under the aegis of overall economic restructuring in the state from the mid-90s, reforms in the power sector in Andhra Pradesh were initiated in 1996 with financial support from the World Bank. The reform plans visualized privatization of the power sector to begin by 2003 (PRAYAS, 2004b). However the public at large opposed the reform plans and the widespread agitation saw the stalling of the reform process and end of the ruling political party. With the coming in power of a new political party in 2004, 100% free power for agriculture (compared to earlier prevailing conditions of 80% free power) was announced and implemented (Rao, K. P.C, 2005).

The sections ahead critique the ‘free power policy’ placing it in the context of adaptive policy discussion. The role of power subsidies for agriculture in influencing the adaptive behaviour of farming communities in the light of observed and expected changes in climatic variables is explored. The implications of this policy for over-exploitation of groundwater as a resource and for influencing the degree of vulnerability of the farmers to climatic risks are also discussed.

**Adaptive policy analysis**

**Automatic Adjustment**

The policy does not contain any mechanisms to automatically adapt itself to the changing conditions such as declining water tables, declining agricultural yields, and decline in farm-level revenues etc.

**Integrated Assessment**
Just few months after the announcement of the free power policy, there was a reported rise in number of un-authorized connections that rose from 1.39 lakhs to 3.5 lakhs. Furthermore, large farmers that make up only 5-6% of the total farming community, account for over 30% of the total agricultural energy consumption for their large farms, horticultural lands etc. The blanket free power policy hence benefited these large farmers who could now enhance the capacities of their pump sets (PRAYAS, 2004a). The policy hence was not able to anticipate the potential misuse of the provisions by incorporating the social and ecological concerns and had to be revised within a year of coming into existence. The Free Power Policy for agriculture was modified with effect from 1st April 2005\(^2\). The point here is that the policy assessment only came after it was announced, when it became clear that it could not be implemented as announced, hence the policy was not even capable of adapting to existing and predictable conditions, much less to unforeseen conditions.

Multi-perspective Deliberation

There is no stakeholder dialogue or consultative platform that is envisaged for building in the feedback mechanisms within the policy.

Formal Review and Continuous Learning

Strong oppositions to the free power for agriculture policy voiced the ecological implications in the form of over-extraction of ground water that is already dwindling in several regions (PRAYAS, 2004a). However there was no formal mechanism or framework to review the policy periodically and building lessons from the ground.

Encouraging Self-organization and Networks

The policy by itself does not leverage any self-organization mechanisms for sustainable agriculture and water resources management. The policy as of now does not have features that promote local level interventions and solutions to manage region-specific risks to climate variability and change.

\(^2\) Farmers having more than 3 connections in dry land, more than 2.5 acres land holding in wetland, IT assesses and corporate farmers are not eligible for free power. The modified policy proposes incentives and disincentives to promote energy saving measures, ensuring regular power supply and reducing T and D losses. The policy further proposes incentives and disincentives to promote energy saving measures. Reduction of tariffs from 50 paise to 20 paise per unit is proposed for farmers going for energy saving devices. It is also planned that new agricultural connections shall be released in dry land areas with incentives being given for promoting lift irrigation in order to reduce groundwater exploitation (GoAP, 2006-07).
Subsidiarity

The policy is being managed at the highest level of jurisdiction i.e. at the state level and does not have different stakeholders at different levels of governance. The institutional entities operate at the state level hence there are no implementation processes at the lowest level where the impacts are being felt.

Promoting Variation

The policy does not trigger diversity and risk spreading. Instead, with free supply of power for agriculture, there is lack of incentive to switch to energy-efficient power machinery. Irregular but free power supply might become the reason for overuse of pumpsets, which are then left unattended. Further, there is scope to engage in water-intensive agriculture, thereby facilitating an easy shift from traditional drought-hardy varieties to more water-intensive cash crops such as paddy and sugarcane. Lack of regulation on water exploitation has also led to an increase in the number of bore wells in the region. This has further resulted in declining water tables often leading to crop failure when coupled with lack of rainfall and access to timely irrigation.

Conclusions

For the past two decades, there has been a declining trend in investments in the agricultural sector as compared to the promotion of subsidies. These subsidies in the agricultural sector account for about 2% of the nation’s GDP, thus limiting the Government expenditure and investment for other areas of importance such as public health, education, rural development, research etc (Fan, S. et al, 2007). Hence, instead of supporting blanket subsidies in the agricultural sector, investments into infrastructure development and research and development for efficient irrigation technologies and improved crop varieties should be promoted.

The decadal rainfall in Chittoor and Anantapur exhibits a declining trend. However, communities are still engaging in agriculture, with the number of borewells in the region increasing and going to greater depths (>350-400 feet). Furthermore, monetary resources required for the fixed costs of drilling the well, pumpsets and recurring costs of maintenance often become futile investments in areas with dipping groundwater levels. This can spiral the small and marginal farmers (forming a majority of the farming community in Andhra Pradesh) into greater debt, apart from causing natural resource exploitation and
mismanagement. In conclusion, the free power policy is maladaptive in nature because though it is enabling the communities to cope in the short-term, it is not helpful to farmers in adopting sustainable and adaptive agricultural practices; thereby exacerbating their vulnerabilities to risks in the long-term. These risks are associated with decline in surface water, low groundwater recharge and potential declines in agricultural yields and farm-based incomes. Changes in climatic patterns and the uncertainties involved in estimating the magnitude of these changes adds to the risks to the agriculture sector. This discussion hence highlights the need for policies to have adaptive mechanisms in order to best adjust to possible social, economic and environmental uncertainties.

References


Rao, K. P.C, 2005. Rationalization of Input Subsidies in Andhra Pradesh Agriculture. IFPRI (International Food Policy Research Institute), South Asia Regional Office, New Delhi