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SmartLessons

real experiences, real development

Improving Lives through Irrigation: How introducing community procurement of pumps raised productivity in Assam

Irrigation was the anchor intervention of the Assam Agricultural Competitiveness Project¹ (AAPC). Of the project's 15 interventions, irrigation was the one from which the majority of benefits flowed. But by midterm review, the project had reached only 16 percent disbursement, fewer than 3,000 STW (shallow tube well) pump sets (out of a target 60,000) were installed, and there was a suggestion that the project should be closed. This SmartLesson tells how that apparent failure was transformed into a significant success story.

Background

AACP's irrigation intervention was to provide groups of three small-scale farmers (land holdings below 2 hectares) with a 50 percent grant to purchase a shared irrigation pump. This was to exploit Assam's significant but

largely underused (22 percent) groundwater resource. Most of the state's cultivation — including 70 percent of its rice crop — is carried out during the monsoon season. Without access to water in the dry winter months, farmers are unable to increase their yields, improve their cropping intensity, or diversify away from rice cultivation.

The project had tried four times to carry out international competitive tendering for tranches for 10,000 pumps. None had been successful (worth some \$ 5 million each). Low-priced, poor-quality, unsupported, and unpopular pump sets kept winning the tenders. Uptake by farmer groups was slow, since they were unfamiliar with the brands. And the pumps that they did get experienced frequent breakdowns and received little after-sales service from suppliers — resulting in a large number of complaints from farmer groups.

Lessons Learned

Lesson 1: Develop an effective World Bank supervision strategy.

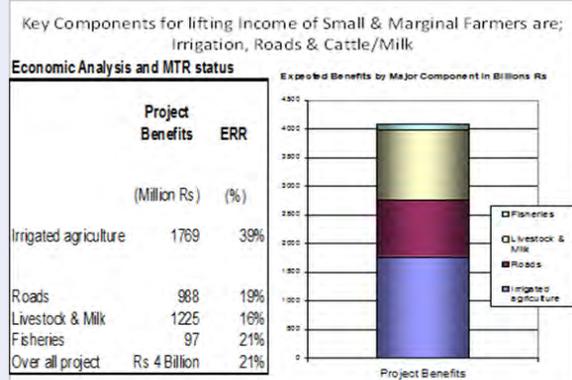
The primary need was to convince the project's management of the scale of the problem. This was achieved at the supervision mission wrap-up meeting of the midterm project review (attended by the chief



Assam is located south of the eastern Himalayas in northeastern India. It comprises the Brahmaputra and the Barak river valleys along with the Karbi Anglong and the Dima Hasao districts and covers an area of 30,285 square miles (78,440 square kilometers).

¹ See the SmartLesson: "Revised Supervision Strategy: Whatever you attend to, you get more of! Improving agricultural competitiveness in Assam," by Grahame Dixie, Manivannan Pathy, and Kalesh Kumar.

Figure 1: Project Key Components



secretary and followed up in the aide memoire), which emphasized the critical importance of the irrigation component in delivering the project benefits (see Figure 1).² Quite simply, if this component did not work, the whole project would not be able to deliver the level of benefits commensurate with a sensible economic return on the overall investment of about \$200 million.³ Calculations showed that without a successful pump-set program, the project would fail. This galvanized the attitudes of the project's management and senior government officials, who agreed that resolving the issues surrounding irrigation procurement and distribution was the key priority in project implementation.

The solution involved the following:

- Revising the grant ceiling levels to account for increases in costs;
- Opening up the certification of shallow tube well boreholes to a wider number of officials, to reduce holdups and the chances of individuals' using this process to extract payments from beneficiaries; and
- Introducing community procurement processes.

Lesson 2: Consider the problem from the viewpoint of farmers, and devise an innovative solution that addresses their needs.

The project devised an innovative process of community procurement by adopting a demand-driven model. This model was based on the following principles:

- Farmer groups should be able to choose the pumps themselves — from a preselected list of products drawn up through a state selection process, but based on an analysis of popular irrigation pumps in the state.
- Preselected suppliers should be asked to commit to offering lower prices for project beneficiaries to reflect the potential size of the market opportunity.

² Figure 1 was the actual graphic used in the supervision wrap-up to drive home the point of the criticality of irrigation to the success of the project.

³ The World Bank International Development Association (IDA) component was \$142 million; the remainder is made up of contributions from the state and the project beneficiaries.

- With large numbers of orders, suppliers should commit to providing better after-sales service for their pumps.
- A physical asset audit process should be introduced to verify that pumps are delivered, installed, and used by the intended farmer groups.

To help farmer groups ensure that the pump sets met acceptable standards and were procured at reasonable prices, the project carried out the following exercise as a facilitation service to the community:

1. The technical standards for the pumps were set by the state. Manufacturers and suppliers were then invited to submit — through an open competitive process — the prices of their models that met these standards.
2. The Department of Agriculture published a Floating of Enquiry that sought the willingness of a range of manufacturers to sell the pumps to farmer communities at predetermined competitive prices against laid-down technical specifications and after-sales service. After evaluation, the government of Assam published a shortlist of brands and models.
3. Irrigation groups could then procure the pumps of their choice from this list at a time of their own choosing. They could procure the pumps either from the manufacturer's local outlets or from the authorized dealers.⁴
4. Irrigation groups contributed 50 percent of the full cost of the pumps and installation costs. They paid their share in cash to the manufacturer's authorized dealer.
5. The project bore the remaining 50 percent of the cost. The project's share was released to the supplier, once the bill was submitted along with the necessary endorsements by the concerned agriculture engineer (and the leader of the farmers' group).



Irrigation enables farmers to grow up to two additional crops: winter vegetables and an early summer paddy crop.

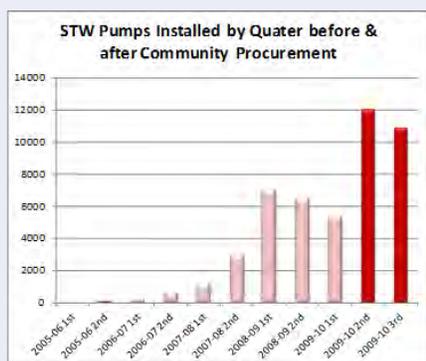
Photo Credit: Grahame Dixie

⁴ Farmers were also allowed to select pumps from other manufacturers, provided they received prior concurrence from the Department of Agriculture, that the cost of the alternative pumps was no more than 10 percent higher than the average price of the shortlisted models.

Lesson 3: Monitoring is absolutely essential.

The project also developed a robust system to monitor the targeting and use of pumps. A third party physically monitored 10 percent of every batch of 4,000 pumps distributed. The review helped with identification of deficiencies and areas of weakness in systems, controls, and the equipment's field performance. But above all, it reassured the project that the pump sets were being used by the selected beneficiaries.

Figure 2: A Measure of Project



Conclusion

The change in the procurement process transformed the project:

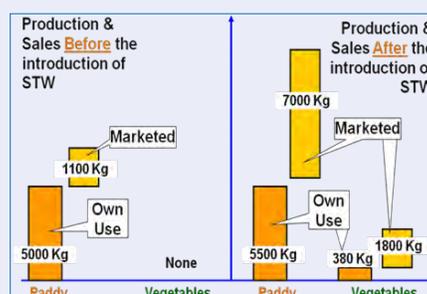
- **Increased distribution.** More STW pumps were distributed in the six months of the 2009–2010 winter dry season than in the project's previous four and a half years (see Figure 2).
- **Acceptability to the community.** The community procurement process allowed manufacturers with varying capacities and sizes to apply. Instead of a single supplier being selected through International Competitive Bidding, the process resulted in 13 suppliers and 25 models for the farmer groups to choose from.
- **Lower costs.** In most cases, the unit cost of pump sets showed a reduction of up to 7 percent.
- **Better after-sales service.** Since the pumps were delivered by the suppliers' local dealers, communities were ensured of improved after-sales service from their local dealers.

This increased uptake of the shallow-tube well pumps helped farmers increase their crop production. Monitoring and evaluation (M&E) activity has shown that yields, market surplus, and cropping intensity have all increased. Each three-farmer group, in aggregate, will amount to some two hectares. After the introduction of the pump sets, cropping intensity increased from 128 percent to 183 percent.⁵ Farmers were able to grow summer (boro) rice, which is higher yielding, as well as an irrigated winter vegetable crop on a portion of their farm. Practically, this means that a typical group of three small farms sharing a single diesel shallow-tube well pump set will almost double their production of paddy (see Figure 3).

Home consumption of rice has increased by about 10 percent (from about 1,670 kilograms to 1,833 kilograms per family, or from 5,000 to 5,500 kilograms per irrigation group), while marketed surplus has increased over fivefold, significantly boosting farm net incomes. In total, the project has increased paddy production in the state by over 300,000 tonnes and vegetables by about 100,000 tonnes. This process was credited with switching Assam from being a net importer of rice to having a surplus to export, and enabling the state to win a national award for improved food security. In total, the incremental income increase of the 285,000 beneficiaries of the whole project is about \$225 per family per year. This was estimated as a total of over \$60 million in FY2010, rising to some \$100 million in FY11, of which 70 percent is directly the result of the success of the irrigation component.

Figure 3: Field Results of the Intervention

Field Results of the Introduction of Shallow Tube Wells to the Aggregate Production of a Group of Three Farmers Sharing an Irrigation Pump.



Source: Calculated from the third-party M&E consultants' six-month reports.

⁵ Before the intervention, farmers, through partial multiple cropping, used 1.28 times their land area. This increased to 1.83 times their land area; that is, that they were now effectively double-cropping their entire farm.



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