REDUCING RURAL POVERTY IN INDIA: AN IMPACT EVALUATION OF RURAL INVESTMENTS IN ANDHRA PRADESH

Approach Paper
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Background and rationale

1. The reduction of income-poverty is central to the development challenge in India, and Indian poverty reduction is central to meeting the MDGs at the regional and global level. In 2001 there were 367 million below the dollar a day poverty line in India, of which 310 million (85 percent) were in rural areas[1] more than that in any other country[2], and accounting for one third of the world's poor.

2. Given the high rural contribution to poverty, it is not surprising that several research studies have found there to be a strong link between agricultural growth in India and poverty reduction.[3] Other studies have found a direct link between agricultural investments, such as irrigation, and poverty reduction.[4]

3. Hence rural income-poverty in India was selected as the subject of the third impact evaluation to be carried out under the DFID-OED partnership.[5] This focus on rural poverty is consistent with the country strategies of the two agencies, so that the evaluation will provide policy-relevant information regarding these strategies. In the case of the World Bank, strategy in India has shifted toward directly addressing rural poverty.[6] DFID's Country Strategy Paper for India has objectives related to pro-poor reform, investments in basic services, empowerment of the poor and improved environmental management, all of which relate to the selected DFID intervention; DFID's new Country Assistance Plan has an even stronger focus on improving the livelihoods of the poor.

4. In order to define the focus of the study one state has been selected. As the intention is to examine both World Bank and DFID supported interventions to reduce

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1. The high contribution to poverty of rural areas reflects both the rural population share (72 percent) and the greater incidence of poverty in rural areas (42 percent) compared to urban ones (19 percent). Sources: http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp, accessed January 25, 2005, and Chen and Ravallion (2004).

2. By 2001 China had 211 million poor (Chen and Ravallion, 2004).

3. See for example Ravallion and Datt (1996), who find that rural economic growth helps reduce both rural and urban poverty; and Datt and Ravallion (1998) which illustrates that the rural poor do indeed benefit from agricultural growth.

4. For a general discussion see Lipton et al. (2003), for India in general see Fan et al. (2000) and for Andhra Pradesh see Krishna et al. (2004), whose findings are reported later in this paper.

5. The first two studies under this partnership covered Ghana basic education, and Bangladesh maternal and child health and nutrition.

6. The 1995 CAS was entirely focused on issues such as improving finances of the public sector, structural reform, and reforms of key sectors of economy; an orientation which was largely continued in the 1997 CAS. But the 2001 and 2004 CASs pay explicit attention to pro-poor interventions, with an emphasis on community-driven approaches. Rural livelihoods appear under 'investing in people and empowering communities', which includes a page on the need for investment in irrigation infrastructure and management (pp. 37-8).

rural poverty, the chosen state was one of DFID's four focus states.[7] Of those four it had to be one in which the World Bank has a portfolio of active, or recently active, rural development activities. Based on these criteria, Andhra Pradesh (AP) emerged as the priority candidate.[8] The selection of projects to be evaluated in AP was based on discussions with staff in the Bank and DFID Delhi offices and the DFID office in Hyderabad.

Background on the selected interventions

The interventions

5. It is proposed to evaluate the following interventions in AP:

- World Bank AP Irrigation II and III. The latter project closed in June 2004, although some of the works are yet to be completed using Government of Andhra Pradesh (GOAP) funds. An impact evaluation of this project would be completed by the end of FY06. (June 2006)

- DFID AP Rural Livelihoods Project (APRLP). This project, begun in 2001, is due to close in mid-2006, but will likely be extended by one year. Since it is still too early to conduct an impact study of this project, an interim assessment would be carried out during the coming year, with an impact evaluation being carried out at the close of the project, in mid-2007.

6. AP Irrigation Project II was implemented between 1987 – 1994 with two components: (1) the Sriramasaggar irrigation scheme (modernization and new development of 328,000 ha in total); and (2) The Srissailam Right Branch Canal (SBRC) irrigation scheme (construction of a new canal, with development of approximately 65,000 ha.).[9] The purpose of AP Irrigation III was to complete what AP Irrigation II had left undone, which it did from 1997- 2005, but incorporating also new state procedures on irrigation management.[10] The evaluation will focus on the SRBC component, that is the impact of the water delivered through the new canal works on the livelihoods of farmers in the command area.

7. APRLP follows on from an earlier DFID-supported watershed project in AP, but with an entirely different approach. The project supports the formation of self-help groups (SHGs) of women and the poor at village level in villages in five districts. These groups come together with a common purpose in order to undertake group activities with the benefit of training and credit provided through an NGO designated as the Project Implementing Agency (PIA) for that village. The credit comes from a

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7. These are Andhra Pradesh, Madhya Pradesh, Orissa and West Bengal.

8. Possibilities in each of the other four states, and Karnataka, where DFID has been active until recently, were also considered.

9. The US$131 million project was rated highly unsatisfactory by both the ICR and PPAR for the simple reason that, on account of construction delays and other problems, the project failed to deliver any water to farmers.

10. As of 1997 publicly-funded irrigation schemes in AP have had to be managed by a registered WUA, with 10,000 association registered in that year alone.

revolving fund operated at village level, falling under the auspices of the Village Committee, which is the collective agency representing the various SHGs in the community. Within each mandal,[11] the Village Committees form a Mandal Committee, which is intended to make representations to the local government on behalf of the communities. This project has strong similarities to the DPIP/RPRP projects supported by the World Bank,[12] though with some exceptions.

8. The two interventions are to be evaluated under a common framework. However, the evaluation will comprise two parts (with separate reports) to reflect the respective projects' schedules (para.5). On completion of the second study, a synthesis volume will be prepared.

Justification for project selection

9. The justification for the selection of these interventions is as follows:

- The two projects complement one another: one is for irrigated agriculture and the other for watershed development (i.e. rain-fed agriculture). The synthesis of the results from the two studies will thus compare the relative merits of the two approaches to developing rain-fed areas: irrigation or investing in other means of livelihood diversification combined with watershed management.

- Irrigation is seen as having great potential in AP for agricultural development. The new GOAP has proposed an ambitious program of agricultural expansion, and has welcomed the proposed study as a potential vindication of its approach. Studies have indeed shown the role of irrigation in reducing poverty: an analysis of poverty trends in 36 villages in AP found that irrigation was the main factor explaining escaping poverty for one quarter of all households who had done so (and in some areas for over half of all households; Krishna et al, 2004). Moreover, malfunctioning irrigation systems explained the fall into poverty of a significant number of households. These findings are not surprising since net profits for irrigated crops are 2.5 to 3 times greater than those for rain-fed crops (Wade, 1994).

- Despite this apparent potential, large scale irrigation schemes have a poor track record. Where ex post rates of return have been calculated they fall well short of 10 percent (Thakkar, 1999). A World Bank (1998) review of irrigation in India proposed that irrigation performance needed to be improved through the introduction of user groups (water user associations). This study will collect new evidence now that reforms have been introduced.

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11. A mandal is a sub-district administrative unit defined for purposes of tax collection.

12. The World Bank District Poverty Initiatives Project (DPIP)/Rural Poverty Reduction Program (RPRP) projects have their origins in UNDP's South Asia Poverty Alleviation Program (SAPAP) which was a pilot project begun in 1996 in three districts of Andhra Pradesh. SAPAP adopted a social mobilization approach through self-help groups, village organizations and *Mandal Samakhyas* (i.e. the same three tier system adopted by APRLP). GOAP extended this approach through its *Velugu* program (the local name given to the program supported by the World Bank DPIP and RPRP), first in five districts under DPIP (2000-05), and now to the remaining 16 districts under RPRP. (Source: Deshmukh-Ranadive, 2004).

- DFID is supporting RLPs in all four of its focus states (Orissa is on-going, and the other two are starting). The proposed evaluation will not only produce findings of relevance in its own right, but the evaluation design could also be replicated for use in those other states.[13]

- Plans for an impact evaluation of the Bank-supported DPIPs already exist, so there would be no value added from conducting another evaluation of these projects. Rather, our parallel evaluation of the similar APRLP would be carried out in close collaboration with the Bank team conducting the DPIP study to maximize synergy.[14]

- The projects represent the forefront of current development thinking in their reliance on a CDD approach. In AP Irrigation II and III water user associations (WUAs) are an important part of the proposed irrigation management, foreshadowing the approach being adopted state-wide to irrigation schemes. APRLP is strongly rooted in a CDD approach with group formation at the center of the project. The proposed evaluation will go beyond the utilization of traditional tools to analyze social capital by drawing on social network analysis.[15]

- The study complements other work currently being conducted in OED, specifically the irrigation sub-sector review and the cluster-PPAR of irrigation schemes in Mexico for which a survey is also being fielded.[16] More generally, the study adds to OED's portfolio of impact findings and develops in-house awareness and skills in this area.

Evaluation questions

10. The framework for the study will be rooted in a theory-based approach. The two parts of the evaluation will each address the following main questions:

(i) Have the supported interventions raised incomes amongst the rural poor? Have all groups of the poor benefited, or have certain groups been excluded, and how the interventions have affected rural poverty?

(ii) Do the income gains appear to be sustainable?

(iii) Have such income gains been achieved in a cost effective manner (is the rate of return acceptable)?

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13. The OED team will advise on evaluation design in these other states, but the projects themselves will bear study costs.

14. Agreement has been reached in principle to share methodologies, survey instruments etc, with the intention of producing comparable studies.

15. Social network analysis is a branch of sociology which considerably predates, and is more sophisticated than, the recent attention paid to social capital by economists. See Bott (1967) for a classic of social network analysis and Burt (2000) for a recent discussion, including a comparison with social capital.

16. In the latter case synergies have already been exploited by utilizing inputs from the impact study team in advising on survey design for Mexico, and using feedback from that study as to design of the survey instruments for this study.

11. All three of these questions contain implicit questions about the community-based approach adopted in the projects. For example, does the dynamic of community organization coalesce around existing networks, which cannot bridge social boundaries? Is group formation sufficiently embedded to be lasting and hence sustain the supported activities?

Evaluation design

AP Irrigation II and III

12. This part of the study would be based on two surveys, one in May-June 2005 and the second in February 2006. The design takes advantage of the fact that baseline data can still be collected from farmers not yet connected to the irrigation system, even though the project has already closed. Data will be collected from three groups – those who have had water since the 2004 kharif season (July-October), those who will be connected in 2005, and a control of rain-fed farm households (Table 1). Thus 'double difference' comparisons can be made with the control, and there will be information on households who have been 'exposed to two treatments' (i.e. had irrigation for two years). The survey will be a panel; i.e. the same households will be visited in each round.

Table 1 Scheme for survey coverage

	Round 1	*Round 2*
Group 1		
Group 2		
Group 3 (control)		

Note: shading indicates that the group has been exposed to irrigation.

13. A two stage sample design will be used. A sample frame of all eligible communities for group 1 and 2 will be drawn up. Eight communities will be randomly sampled for each of the two groups. Eight communities will be selected for the control, matched on observable characteristics to the group 2 communities. The control will be drawn from the same geographic area as the irrigation projects, but beyond their area of influence (which probably implies that they cannot be neighboring communities since there may be labor demand effects on these communities). Fifty households will be sampled in each community, giving a survey size of 1,200 households.

14. The household survey will contain the following modules:

- Household characteristics (roster, housing quality, education, ownership of consumer items and productive assets)
- Access to and use of irrigation facilities. Participation in irrigation management, O&M.
- Pattern of production; inputs, outputs and yields.

- Income.
- Health status

15. In addition to the household survey there will be community surveys, with a qualitative component, and key informant interviews.[17]

16. Data collection will also take place at the project-level to analyze project implementation, the cause and costs of delays, and secondary data on environmental aspects (costs and benefits). This data collection will also address institutional (including policy) factors relevant to project returns, such as output pricing and the effect of subsidized electricity for irrigation (on which see World Bank, 2001). These data, combined with the farm-level benefits stream, will be utilized to undertake a cost-benefit analysis of AP Irrigation II and III combined, and AP Irrigation III alone.[18]

AP Rural Livelihood Project

17. This part of the study would also utilize two surveys, one in May-June 2005 and the second at the end of the project in 2007. The first survey will be used for an interim assessment of the project, focusing on process aspects. To the extent that some communities have been fully exposed to the project, some analysis of impact may be possible. The survey will adopt the same three group approach proposed for AP irrigation, namely already exposed, to be exposed and control. The survey will also be a panel. Selection of the control group is complicated by the presence of DPIP throughout the state. Survey design will have common core components with that used for the AP irrigation study, but with unique modules related to RLP. In addition to project-specific modules, a module will be included on social networks.

18. For this intervention, project-level data will be collected to provide the institutional context and to facilitate the economic analysis.

Partnership and peer review

19. The study is being carried out as a part of the DFID-OED partnership agreement. There will be consultation with both DFID Evaluation and DFID Delhi on the design of the study. DFID Delhi will participate extensively given the potential benefits for their other programs. One or more local collaborators at national and regional levels will be identified to assist in the implementation of the study. Danish CTFs are being used to finance a part of consultant costs.

20. Through collaboration with field staff, Bank and DFID staff will have opportunities to comment on the draft reports, and any intermediate outputs.[19] In

17. More structured surveys may be designed for specific groups to be identified.

18. That is, considering AP II as a sunk cost. As noted above, AP II alone had zero benefits, so the rate of return to that project by itself was negative infinity.

19. For the two previous impact studies presentations were made of preliminary findings, allowing staff an opportunity to provide feedback at that stage.

addition, independent reviews of the study will be commissioned from peer reviewers outside of either agency.

Study schedule

21. The proposed time line for the evaluation is as follows:

Identification and approach paper	11/04-03/05	Fieldwork (second round: irrigation)	01/06
Design and questionnaire development	02/05-04/05	Data cleaning and preliminary analysis	02/06-03/06
Fieldwork (pilot and first round)	05/05-06/05	Data analysis and report drafting (AP II and III)	03/06-04/06
Data cleaning and preliminary analysis	07/05-08/05	Comments and finalization of report (AP II and III)	05/06-06/06
Draft interim assessment of RLP	09/05-10/05	Fieldwork (third round: RLP)[20]	Mid-2007
Complete interim assessment of RLP	12/05	RLP report	End 2007
		Synthesis report	Early 2008

22. The analysis of AP irrigation will take approximately 18 months, with the report completed by June 2006. The study for RLP will not be completed until the end of 2007, on account of the project timetable.[21]

Dissemination

23. Dissemination will be through:

- Workshop presentations at the Bank, DFID and other interested agencies (e.g. IFAD)
- Wide dissemination of the reports and Précis, and production of a synthesis report (covering also DPIP)
- Workshop presentations in Delhi and Hyderabad
- Publication of articles stemming from the studies in academic journals, including evaluation journals and those pertaining to agriculture and development, and one (or two) targeted at *Economic and Political Weekly*

Budget

24. As for the previous two OED impact evaluations, a substantial part of the total costs is expected to be covered by the OED partnership with DFID, and also from consultant trust funds. The total direct costs of the evaluation are estimated just under $740,000 over the period FY05-08, which will cover study preparation, survey, data analysis and dissemination costs.

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20. Timing dependent on actual end date of RLP.

21. This does not mean the study duration is two and a half years, since staff will not be fully employed on the study throughout this time period. There are less than two years of staff time on the two studies, plus another two years of consultant time.

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