SUCCESSFUL APPROACHES TO IMPROVING WASTEWATER MANAGEMENT AND SANITATION IN PAKISTAN

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Abstract

The paper outlines the planning, methods and results of working with members of small and medium sized rural communities to meet identified needs for wastewater management and sanitation. The projects were designed and implemented by the National Rural Support Programme, Pakistan's largest NGO.

Although many rural people recognize the need for wastewater management and sanitation, these remain neglected issues in the majority of villages, in part because people assume that the Government is responsible for funding and implementing the necessary infrastructure. Since economically-marginal villagers cannot afford the costs themselves, innovative methods of raising funds and providing expertise are required.

The paper argues that NRSP's methods of 'mobilizing' villagers provide a basis from which to overcome the inertia and to address these critical problems. NRSP has successfully implemented hundreds of wastewater management and sanitation schemes, using social mobilisation and drawing on social capital. It has implemented these projects through small Community Organizations and larger Village Organizations. NRSP has also worked with members of District Governments to fund and implement small and large-scale projects.

The paper describes the methods used to accomplish these activities. It also describes the benefits to everyone involved in participatory methods. It argues that the practices followed by NRSP provide a model for other NGOs and Government departments interested in similar activities.

Introduction

This paper outlines the planning, methods and results of working with members of a number of small and medium sized rural communities to meet identified needs for wastewater management and sanitation. The projects were implemented by the National Rural Support Programme (NRSP), Pakistan's largest NGO.[1]

[1] NRSP is one of ten Rural Support Programmes operating in Pakistan.

Since NRSP's mandate is to alleviate rural poverty, it is central to NRSP's philosophy that the economically-marginal have the right to decent sanitation systems in their communities. It is an operating principle at NRSP that any physical infrastructure project, including wastewater management and sanitation schemes, must benefit the majority of households in a village and must include the poorest community members.

In describing an integrated, community-based approach to wastewater management and disposal, the paper identifies a proven method of overcoming the prevailing combination of dependency and mistrust that exists with respect to village development projects in most rural communities in Pakistan.

Wastewater Management Issues in Pakistan

Only 13.5% of rural households in Pakistan have any sewage collection and disposal system[2], and many of these provide only minimal 'disposal' *i.e.* untreated waste is deposited in open gutters in laneways or, at best, in fields at the edge of the village. In the projects carried out by NRSP, 90 to 100% of the households did not have a latrine prior to the project.

In most villages, the narrow lanes between the houses are not properly surfaced, which means that rainwater, kitchen runoff, animal waste and human waste accumulate in the streets. In the majority of rural areas, household, farmyard and small-scale industrial effluents flow into surface ponds, rivers or the canal irrigation system. Whether the wastewater seeps into the soil or flows into the drinking water supply, water borne diseases are only one aspect of a 'negative nexus' that follows from poor sanitation and wastewater management.

NRSP's Portfolio of Projects

NRSP's Wastewater Management and Sanitation projects are part of a long-term effort to implement physical improvements in communities. NRSP's portfolio of Community Physical Infrastructure (CPI) schemes includes drinking water supply schemes, communication (i.e. link roads and small bridges) schemes and agriculture-related projects (many based in improving the supply of irrigation water) in addition to sewerage and drainage schemes.

NRSP's Physical Infrastructure and Technology Department had implemented 617 of these Community Physical Infrastructure schemes prior to 2000.

NRSP became a partner of the Pakistan Poverty Alleviation Fund (PPAF) in the year 2000. That partnership enabled NRSP to rapidly scale up its CPI programme. Since then, NRSP has implemented 143 stand-alone drainage and sanitation projects with funding from the PPAF. (See Appendix A) These projects have benefited 11,241 households, and cost a total of Rs 58,466,366 (USD 974,472).

NRSP has implemented five large scale Integrated Community Physical Infrastructure Projects with PPAF funding. These have a combined value of USD 165,870. (See Appendix B)

[2] Bhutta, Dr. M. Nawaz

There have also been 268 Sanitation projects implemented by NRSP with funds from other donors, including the Barani Village Development Project,[3] Islamic Relief, ActionAid and the D. G. Khan Rural Development project. These are detailed in Table 2, Appendix A. These have benefited almost 75,000 households.

In a few cases, NRSP has implemented large-scale sanitation projects with funds from foreign donors: Canada's CIDA, for example, has provided funds for NRSP-implemented large-scale sanitation projects in Lodhran (southern Punjab).

Technological and Social requirements for successful wastewater management Projects

In its 13 years of operation NRSP has found that the only way to achieve a comprehensive solution to wastewater management and sanitation problems is to devise projects based on community requirements and to involve community members at every stage, from identifying needs to the long-term maintenance of the projects. These needs must be understood in both technological and social terms and the two must be integrated with each other, if a project is to be both successfully implemented and sustained in the long term.[4]

Social Mobilisation

Because the history of rural development in Pakistan is largely a history of under-performance, mistrust and apathy, it is necessary to build trust between a development NGO and rural communities. Since it was founded in 1992, NRSP has used "social mobilisation" as the framework for all of its poverty alleviation and development activities. Social mobilisation begins when NRSP 'Social Organizers' engage in dialogues with members of rural communities. These dialogues are founded on two things: the first is that if they form one or more Community Organizations (COs), each with members of 15 to 20 households, and if they pool their human and financial resources, members of rural communities can meet their development needs. Once a CO is formed, the community members prioritize their needs: many identify sanitation schemes as their first priority because they understand the connection between unsanitary conditions very well.

The other requirement is that CO members must work together to make maintain the physical infrastructure of the project for the long term. All COs are encouraged to save small amounts of money regularly: when a CO takes on a sanitation project its members have funds in reserve to make the necessary contribution, which averages about 20%. Households that are poorer than others can contribute to the project by providing labour.

For large wastewater and sanitation projects, several COs form a Village Organisation (VO) to represent the majority of the households. The VO elects a President, a Secretary and a Manager. The CO or VO members are responsible for providing the land for wells,

[3] Funded by the International Fund for Agricultural Development and the Rawalpindi District Government

[4] NRSP's approach to the social aspects of organizing communities to meet their sanitation and wastewater needs reflects that of its exemplar, the Orangi Pilot Project in Karachi, Pakistan's largest city.

water tanks and filtration ponds. In NRSP's experience there is always someone willing to donate land for these projects.

The next step is for NRSP and the COs (or the VO) to sign a formal 'Terms of Partnership' (ToP) agreement. At least 75% of the community representatives must be present in a meeting to sign this agreement. In the meeting, the NRSP staff explains every detail of the project. Before they sign, everyone involved knows the specifications, the contributions required from all parties, the disbursement schedule for funds, the implementation process and procedures, the time required to complete the project and the estimated annual operation and maintenance costs. They are also aware of the roles and responsibilities of NRSP and other partners.

The CO or VO then constitutes a Project Committee which assumes responsibility for the overall implementation of the project, and the management and operation of the project after its completion. The Committee, working closely with NRSP, supervises the project execution, makes sure that instructions from the NRSP engineer are followed, assigns responsibilities to VO members and keeps accurate records of all activities and expenditures. The committee also records the progress of the work and reports it to NRSP. The same committee maintains the Project records and accounts. If there are any discrepancies, the committee informs the VO members and NRSP as soon as possible.

After signing the ToP, the CO or VO opens a Project bank account. NRSP disburses the grant to the VO in instalments, as each stage of the work is completed. The Project Committee forwards a request to NRSP for the release of the funds in the form of a 'Resolution' signed by at least 75% of the VO members. NRSP's accounting staff check the expenditure vouchers, and the Engineers check the progress and quality of the work. Before releasing the final payment the NRSP Engineer makes sure that the work has been completed satisfactorily and that the best materials have been used.

Working with Local Governments to Implement Sanitation Schemes

In the year 2000 the entire system of Government in Pakistan was re-structured, resulting in decentralized administrative and financial authority. The purpose was to achieve more effective service delivery and transparency in decision-making. Twenty-five percent of each District's development budget is now required to be channelled through bodies called Citizen Community Boards (CCBs). This has provided an excellent opportunity for NRSP and its member COs and VOs to be registered as CCBs and to utilise some of these development funds for wastewater management and sanitation projects.

Some elected officials, one of them a Member of the National Assembly, have enthusiastically taken up the challenge of joining with NRSP and with COs and VOs to meet these needs. Members of several District Governments have also co-operated, realising that the development funds available to them can be leveraged with community funds and with donor funds (in this case PPAF and NRSP), thereby reducing their costs while accomplishing necessary development projects. Here, too, community involvement following from social mobilisation was the key to completing the project successfully.

Some elected members of District Governments have been slower to respond, perhaps fearing that their role as 'donors' in control of development funds would be diminished.

Some also worry that working with an NGO might reduce their authority, or that it might result in more complicated procedures. NRSP always works to dispel these concerns and to encourage potential partners to visit completed schemes and talk to everyone involved.

Training and Capacity Building

NRSP arranges training programmes for the members of the committees established by the COs and VOs. The members learn how to manage the construction process, how to keep records, how to procure high quality materials, and, after project completion, how to properly operate and maintain their projects. They are also encouraged to adopt participatory ways of working: holding regular meetings, ensuring attendance of at least 75% of members in meetings and ensuring that CO members are saving regularly. Members learn how to maintain accurate records and to link the VO with relevant organizations.

When the local Government is a partner in a sanitation scheme, NRSP also trains the relevant Government officials in planning, designing and implementing projects and in mobilising and motivating community members to participate in them.

Technological Requirements of Projects

Members of NRSP's Physical Infrastructure and Technology Development Department, all of them qualified Engineers, assess the needs identified by community members and then create a Project Digest which identifies the technical, economic and environmental requirements for the specific project. In an Integrated Project (Appendix B), this usually includes water harvesting and storage systems, distribution systems, street paving, installing connections to the drainage system in each household, installing sewers, building filtration and water treatment tanks and installing pipes to safely carry treated waste away from the village – either into the fields where it can be used as fertilizer or into a water channel.

The Project Digest also details the costs of the project, including all materials and labour, and the contributions of the community members and NRSP. When a District Government is involved as a partner, its share is also recorded in the project Digest. The Digest also estimates the operation and maintenance costs, to give the Committees a clear idea of their financial responsibilities.

Potential environmental impacts are also accounted for, although all of the stand-alone or integrated projects are both 'low-tech' and relatively small scale. Care is taken to ensure that only high quality materials are used: this ensures that the systems will last as long as possible and that they will not negatively affect the eco-system.

Monitoring

NRSP has found that regular monitoring is vital to projects. The relevant committees and the NRSP Field Staff monitor the day-to-day activities. If other partners are involved (for example, another funding agency, or members of a District Council), they also check the progress. If a District Government is involved the projects are reviewed regularly in the

Union Council[5] meetings. The NRSP Engineering staff produces monthly and quarterly Progress Reports which they forward to NRSP's regional and head offices. They also maintain a daily diary in which they record progress and/or problems.

Lessons Learned

The effects of cleaner streets and a proper wastewater disposal system are clear and immediate: pollution is reduced or eliminated; people can move about more freely to conduct daily affairs; they can also engage in social and ritual events with more comfort, when they no longer have to worry about staying clean. In some communities, people used to say that the dirty streets worried them when they had to attend funerals but that problem has now been solved.

The Projects result in clean streets, which means fewer mosquitoes and other pests. Fewer people fall ill and the children miss fewer days at school. People develop a keener sense of civic responsibility, and keep the streets clean. Although everyone benefits in terms of lower expenditures on health, there are particular benefits for women and children. The economic situation can also improve because of increased crop production from the wastewater.

Mutual accountability is the key to completing the project on time. A truly participatory approach like the one described here requires that all information be shared, and that decision-making be based on trust and full disclosure. Partnerships with elected representatives present a particular challenge, because Government officials have tended in the past to resist sharing responsibility and resource- allocation with village residents. However, the experience so far indicates that everyone involved realizes that they benefit from being part of this participatory method.

Once people have seen how well these projects can work, they are ready to tackle other development projects that are vital to their communities. Members of local Governments are also more willing to become involved in participatory sanitation projects when they have been involved with NRSP and with CO members. A degree of mutual trust and willingness to plan future projects almost invariably results.

Although many rural residents are quite poor, they are willing and able to contribute funds for community development. In the Integrated projects discussed in this paper, CO members contributed a total of Rs 2,070,451 (USD 34,423). If we count the value of the unskilled labour contributed, (usually about Rs 100 or USD 1.67) per day for unskilled labour) this value is a great deal higher. The total community contribution to all of the projects described in this report is Rs 54,289,161 (USD 904,819).

Once it has been demonstrated that effective interaction between partners is successful, endeavours of this kind can be implemented in other villages. NRSP's small-scale efforts in implementing wastewater management and sanitation projects have been scaled up: the integrated village development and sanitation projects described here are also being replicated on a large scale in several Provinces.

Projects using the principles and methods described in this paper represent significant improvements in the physical condition of the villages – indeed, in most cases they

[5] A Union Council is the smallest unit in the decentralised system.

represent the first efforts ever, to work with communities to address sanitation issues. They also exemplify the ways that people can be mobilized to work together to respond to sanitation needs.

Perhaps most importantly, both provide tremendous learning opportunities for other organizations interested in demand-driven projects of this kind, and serve as potential models for local governments, other communities and donors interested in implementing wastewater management and sanitation projects.

Reference

Bhutta, Dr. Muhammad Nawaz. Wastewater Reuse and Pollution Control. International Symposium on Community Based Approaches: Towards Integrated Water Resources Management. Islamabad: UNDP, 2004. Pp. 71-81.

APPENDIX A

Table 1: Details of PPAF-funded Physical Infrastructure Schemes (Sanitation, Street Pavement and Drains) from December 2002 to June 30, 2005

Province	Total Schemes Initiated	No. of participating Households		Disbursement	Approved Cost	CO Contribution	Total Cost
Punjab	80	7,521	Rupees	19,047,688	23,050,976	10,049,472	33,100,448
			USDollars	*317,461*	*384,183*	*167,491*	*551,674*
Sindh	19	1,031	Rupees	3,194,400	6,163,892	1,988,325	8,152,217
			USDollars	*53,240*	*102,732*	*33,139*	*135,870*
Baluchistan	2	80	Rupees	456,800	456,800	106,414	563,214
			USDollars	*7,613*	*7,613*	*1,774*	*9,387*
NWFP	41	2,403	Rupees	10,160,060	11,201,313	3,113,572	14,314,885
			USDollars	*169,334*	*186,689*	*51,893*	*238,581*
AJK	1	206	Rupees	1,450,000	1,870,058	467,514	2,337,572
			USDollars	*24,167*	*31,168*	*7,792*	*38,960*
Total	**143**	**11,241**	**Rupees**	**34,308,948**	**42,743,039**	**15,725,297**	**58,468,336**
			USDollars	*571,816*	*712,384*	*262,088*	*974,472*

Note: One USD = Rs 60
Source: Physical Infrastructure and Technology Development Dep't. NRSP.

Table 2: Details of Community Physical Infrastructure Schemes (Sanitation, Street Pavement and Drains) July 2002 to June 30, 2005, funded by non-PPAF donors*

Province	Schemes Initiated	Participating Households	Amount Disbursed (Rs)	Approved Cost	CO contribution	Total Cost
Punjab	261	73,047	100,257,722 (USD 1, 670, 962)	RS 109,443,906 (USD 1, 824, 065)	RS 35,901,458 (USD 598,357)	RS 145,345,364 (USD 2, 422,422)
Sindh	6	1, 868	1, 144, 424 (USD 19, 073)	RS 1, 242, 774 (USD 20, 713)	RS 597, 025 (USD 9, 950)	RS 1, 839, 799 (USD 30, 663)
Total	**268**	**74, 915**	**101, 402, 146 (USD 1, 690, 035)**	**Rs 110, 686, 680 (USD 1, 844, 778)**	**RS 36, 498, 483 (USD 608, 308)**	**RS 147, 185, 163 (USD 2, 453, 086)**

* Barani Village Development Programme (BVDP), Canadian International Development Agency (CIDA)
District Governments (DG), Integrated Rural and Urban Development Programme/Khushal Pakistan (IRUDP/KP)

APPENDIX B

DETAILS OF INTEGRATED VILLAGE DEVELOPMENT PROJECTS IMPLEMENTED BY NRSP WITH PPAF FUNDING

Table 1: Dhok Tabarak Shaheed, Islamabad Capital Territory
Participants: 100 households
Total Project Cost: Rs 2,830,275 (USD 47,141)

Component parts of the project	NRSP/PPAF Contribution (Rs)	CO Contribution (Rs)	Total Cost (Rs)	CO contribution
Drinking water supply	499,000	275,114	774,114	36%
Sewer system	300,020	57,200	357,220	16%
Street pavement	754,672	132,827	887,499	15%
Disposal station	100,233	11,000	111,233	10%
Household latrines	1,105,743	368,580	1,474,323	25%
Total	**2,260,668 (USD 37,678)**	**569,607 (USD 9,493)**	**2,830,275 (USD 47,141)**	

Table 2: Integrated Village Sanitation Project
Location: District Mardan (North West Frontier Province)
No. of participating households: 80
No. of participating COs: 4
CO contribution to all costs: 20%
Total cost: Rs 1,967,961 (USD 32,799)

Component	Total Cost (Rs)	NRSP/PPAF Share (Rs)	CO Share (Rs)
Street pavement	1,401,874	1,121,499	280,375
Side drains	346,581	277,265	69,316
Pipe culvert	81,711	65,369	16,342
Disposal Stations	135,795	108,636	27,159
Sign Board	2,000	1,600	400
Total	**1,967, 961 (USD 32,799)**	**157,4369 (USD 26,239)**	**393,592 (USD 6,560)**

Source: Physical Infrastructure and Technology Development Dep't. NRSP.

Table 3: Integrated Sanitation and Development Project
Location: District Badin, Sindh Province

Component	Total Cost	NRSP/PPAF Contribution	CO Contribution	CO contribution %
Drinking water supply	147,564	126,439	21,125	14.32
Street pavement	444,030	344,030	100,000	22.52
Street drains	577,637	396,262	181,375	31.40
Disposal station	154,139	120,389	33,750	21.90
School bathrooms	17,789	13,789	4,000	22.48
Sign Board	5,000	5,000	00	00
Total	**1,346,159 (USD 22,436)**	**1,005,909 (USD 16,756)**	**340,250 (USD 5,671)**	**25.28**

Source: Physical Infrastructure and Technology Development Dep't. NRSP.

Table 4: Integrated Sanitation Scheme
Location: Sudhnoti District, Azad Kashmir
Beneficiary households: 206
No. of participating COs: Nine
CO Contribution to costs: 20%

Component	Total Cost	CO Contribution	NRSP/PPAF Contribution
Drinking water supply storage	2,092,891	418,578	1,674,313
3 latrines each in 2 schools	244,618	48,936	195,745
Total	**2,337,572 (USD 38,959)**	**467,514 (USD 7,792)**	**1,870,058 (USD 31,167)**

Source: Physical Infrastructure and Technology Development Dep't. NRSP.

Street Paving Project
Location: Union Council Bokan, District Jhelum (Punjab)
Beneficiary households: 25 (50 households benefited)
Project Components: Drainage system, street pavement and a sewerage pond
Total Project cost: Rs 421,146 (USD 7,019)
Annual maintenance cost: Rs 12,634 (USD 210.6)
Drainage System cost: Rs 166,692 (USD 2,778)
NRSP/PPAF Contribution: Rs 126,344 (USD 2,105)
District Government contribution: Rs 210,573 (USD 3,509)
Community contribution: Rs 84,229 (USD 1,404)

Street Paving and Drainage System in Mianwali, Khushab (Punjab)
Participating Households: 55
Total cost: Rs 1,050,947 (USD 17,516)
NRSP Contribution: Rs 840,758 (USD 14,013)

CO Contribution: Rs 210,189 (USD 3,503)
Annual Maintenance Cost: Rs 31,530 (USD 525)

APPENDIX C

Before

After