

Final Report
on
Terminal Evaluation of the Sub-Programme
IND/97/946-Small Grants Facility for Water Sector



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for



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Acknowledgements

1. Under the Environment Programme of the CCF-I (1997-2001) of the UNDP, a Sub-programme of Small Grants Facility (SGF) was set up by the UNDP in March 1999 with the main objective of capacity building of the marginalised rural people to address the water and sanitation problems. The main focus of the Sub-programme was on community participation and women empowerment.

2. This report encompasses a review and the terminal evaluation of the SGF Sub-programme. Although the Sub-programme covers small initiatives, its scope and spread makes it a unique initiative with the projects having been implemented across the country in remote areas like Lahul-Spity in north to Manipur in northeast to Angamali down south.

3. The evaluation of such a diverse project would not have been possible without the support and cooperation of the officials of MoEF, UNDP, WAPCOS and last but not the least the NGOs, who played the pivotal role in the implementation of this programme.

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Glossary of Abbreviations

BPL	Below Poverty Line
CBO	Community Based Organization
CCF	Country Cooperation Framework
CIDA	Canadian International Development Agency
DEA	Department of Economic Affairs
DFID	Department for International Development, U.K
F.C.Tank	Ferro-cement Tank
HPSEPPCB	Himachal Pradesh State Environment Protection and Pollution Control Board
IIRM	Indian Institute of Rural Management
JIPM	Joint Industrial Planning and Management
K.L.	Kilo-litres
MoEF	Ministry of Environment and Forests
MoRD	Ministry of Rural Development
MSEAVS	Mithila Samajik Evam Arthik Vikas Sansthan
NEX	National Execution Guidelines
NRCD	National River Conservation Directorate
NGO	Non-government Organization
NHI	National Host Institution
NPD	National Programme Director
O&M	Operation and Maintenance
RUCHI	Rural Centre for Human Interests
SC/ST	Scheduled Caste/Scheduled Tribe
SGF	Small Grants Facility
SHG	Self Help Group
TOR	Terms of Reference
U.C.	Utilization Certificate
UNDP	United Nations Development Programme
WAPCOS	Water and Power Consultancy Services
WSP-SA	Water and Sanitation Programme-South Asia

Executive Summary

1. Water is a precious natural resource, vital for sustaining all forms of life. It is not distributed uniformly in time and space. Due to multiple benefits and problems created by its excesses, shortages and quality deterioration, water as a resource requires special attention.

2. The state of sanitation is also not very encouraging in India. Nearly 78% households in rural areas and 26% in urban areas do not have access to toilets and go for defecation in the open areas, risking their health.

3. As part of the Environment Programme of CCF-I, a Sub-programme of Small Grants Facility for the water and sanitation sector was set up by the UNDP in March 1999. A multilateral grant of US\$ 542,678 was made available for the Sub-programme, which is subscribed by the DFID, CIDA and the Ford Foundation besides a major share coming from the UNDP.

4. The principle objective of the Sub-programme was to support small but innovative initiatives having potential of replication with focus on community participation and women empowerment. Projects as well as the NGOs/Organizations were to be selected on the basis of a strict criterion to ensure fulfillment of the objectives.

5. MoEF was the Executing Agency and the World Bank's Water and Sanitation Programme-South Asia (WSP-SA) was the Implementing Agency for the Sub-programme.

6. The MoEF and the UNDP decided to have the terminal evaluation of the Sub-programme in terms of the achievement of objectives and capacity building at the local, sectoral and the regional levels.

7. Shri R.P. Sharma, Ex-Advisor, National River Conservation Directorate, MoEF, was appointed as Consultant for the evaluation of the Sub-programme. The Consultant was required to undertake field visits in respect of 7 out of the 20 projects sanctioned under the programme and to complete the evaluation in two months.

8. The evaluation was conducted by adopting the methodology prescribed in the TOR issued by the UNDP for this purpose. This, inter-alia, included review of the related documents, meetings and discussions with the officials concerned with the implementation of the programme besides field visits and meetings with the NGOs and beneficiaries there.

9. The evaluation has been divided in two parts, namely: (a) review of procedures and institutional arrangements and (b) evaluation of the sanctioned projects.

10. Till 31.12 2000, WSP-SA was associated with the implementation of the projects. During that period, 9 projects were sanctioned. In June 2001, WAPCOS was appointed as the NHI for implementation of the programme. Under WAPCOS, 11 projects were sanctioned. The projects being small in nature, a 12-month time from the date of sanction

was allowed for their completion. The budget for individual projects was capped at US\$ 30,000 i.e. about Rs.14 lakhs.

11. Proposals received by the NHI were first scrutinized at their level in terms of the prescribed guidelines and objectives of the programme and then put up for approval of the Steering Committee of MoEF. The Steering Committee also approved the work-plan and budget for individual sanctioned projects.

12. The total cost of the 20 sanctioned projects was Rs.2.12 crore, which was well within the budgeted grant amount.

13. The NHI did a close monitoring of physical and financial progress of the sanctioned projects. Funds were released to the NGOs through the NHI in three installments. The first installment of 40% of the sanctioned cost was released on signing of agreement with the NGO concerned, the second installment of 40% on submission of UCs and commensurate physical progress and the last installment of 20% of the sanctioned cost on completion of the projects and submission of all the necessary documents.

14. Initially, the Sub-programme was to terminate on 31.12.2002. However, there were some delays during the implementation and, as such, it was extended till 31.12.2003. The Sub-programme was finally completed on 31.3.2004. Out of the 20 projects, four were completed in 2000, five in 2001, two in 2002, eight in 20003 and the remaining one in 2004.

15. Of the 20 sanctioned projects, field visits were undertaken in respect of 7 projects. In most of the water harvesting and conservation projects, water in the check dams/ponds was not visible during the field visits due to seasonal constraints. The evaluation of such projects was, therefore, based on the feedback obtained from the beneficiaries and NGOs concerned and on corroboration of their views with the field data.

16. On the basis of the findings of the evaluation, the Sub-programme is considered a well conceived and a well implemented project. Community participation with focus on women and marginalised rural population was the cardinal point of the implementation process. The rainwater harvesting projects have been able to remove the drudgery of women to a large extent.

17. The Sub-programme has generated tremendous response from the community. People are willing to contribute up to 50% of the project cost. The programme, thus, holds big promise of replication.

18. Considering the response of the community that this programme has received, its replication is strongly recommended with suitable corrections on the basis of experience gained. To start with, MOEF may consider funding the second phase under its flagship scheme of National River Conservation Plan with a budget of Rs.10 crore to be spent in three years. The UNDP and the other donors may also join later with their contribution to increase the coverage of the programme.

19. On the whole, the SGF Sub-programme has proved to be a step towards integrated water resource management. A bigger initiative on the lines recommended above would be a leap forward and the beginning of a new chapter in managing our natural resources in a sustainable manner.

Final Report on Terminal Evaluation of the SGF Sub-Programme

1.0 Introduction

1.1 Water is a precious natural resource, next to air only, vital for sustaining all forms of life on the earth. It is not distributed uniformly in time and space in India. While some areas face the fury of floods, some other parts, at the same time, suffer from severe droughts. Due to multiple benefits and problems created by its excesses, shortages and quality deterioration, water as a resource requires special attention.

1.2 Three-fourth of the earth's surface area is under water and yet only about 3% of it is usable, the balance 97% being in the oceans. The sources of usable water are rivers, lakes and the ground water.

1.3 India supports about 16% of the world's population as compared to only 4% of the average annual runoff in the rivers and lakes. Growing population and anthropogenic pressures arising therefrom, have been adversely impacting on the water quality of these resources in India. Its uneven distribution in terms of time and space compounds the problem further. Every third person in the country does not have access to safe drinking water. Women in most parts of the country still have to travel long distances everyday to fetch a pot-full of drinking water.

1.4 Nearly 70% of agriculture in India is rain-fed. Part failure of monsoon results in droughts, which are frequently occurring in several parts of the country.

1.5 Despite the growing problems of water scarcity and deteriorating quality, water in India is still managed as a 'free resource' rather than a productive asset with an economic value attached to it. This goes against the concept of conservation of this precious resource.

1.6 The state of sanitation is also not very encouraging in India. As of now, about 78% households in rural areas and 26% in urban areas do not have toilet facilities. These families use open area for defecation in, risking their health. Manual scavenging is still in practice with nearly 60% of the scavengers being women. Nearly 7 lakhs children die every year due to water-borne diseases like diarrhea and dehydration.

1.7 The United Nations Development Programme (UNDP) Country Cooperation Framework-I (CCF-I), 1997-2001 under its Environment Programme envisages 'Management of Natural Resources' as one of the four priority areas with the main focus on management of land, water and forest resources.

1.8 As part of the Environment Programme of CCF-I, a Sub-programme of Small Grants Facility (SGF) for the Water and Sanitation sector was set up through a tripartite agreement executed in March 1999 amongst the Department of Economic Affairs (DEA), the Ministry of Environment and Forests (MoEF) and the UNDP. The MoEF was designated as the Executing Agency and the World Bank's Water and Sanitation Programme – South Asia (WSP-SA), the Implementing Agency for this Sub-programme.

1.9 The SGF Sub-programme is a multi-donor initiative originally conceived with a core grant of US\$ 300,000 provided by the UNDP. However, later in the Year 2000, another three donors contributed together an additional amount of US\$ 242,678 to make the total grant as US\$ 542,678. The details of individual contributions are as under:

Donors	Grant (in US\$)
(i) UNDP	300,000 (55.3%)
(ii) Department for International Development (DFID)	101,060 (18.6%)
(iii) Ford Foundation	100,000 (18.4%)
(iv) Canadian International Development Agency (CIDA)	41,618 (07.7%)
Total	542,678 (100%)

1.10 Expenditure on Administrative and Operational Services was envisaged as US\$ 29,000. Thus a net grant of US\$ 513,678 was available for implementation of projects under the Sub-programme. Based on the then prevailing exchange rate, the total grant for projects amounted to Rs.2.17 crore.

2.0 SGF Objectives

2.1 The SGF Sub-programme supports small-scale innovations, action research, documentation and dissemination of lessons and best practices or other initiatives which can catalyze larger impacts on poverty alleviation and sustainable development of water and sanitation sector. The Fund focuses on water resource management, drinking water supply and environmental sanitation.

2.2 The Dublin-Rio principles are the guiding factors for the SGF Sub-programme, which envisage the following:

- (i) Fresh water is a finite and vulnerable resource, essential to sustain life, development and environment;
- (ii) Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels;
- (iii) Women play a central part in the provision, management and safeguarding of water; and
- (iv) Water has an economic value in all its competing uses and should be recognized as an economic good.

2.3 The SGF Sub-programme was to serve as a model to showcase community led innovations and appropriate technologies, methods and practices for sustained use of water with focus on traditional water harvesting and conservation systems. An important output expected from the Sub-programme was in respect of recommendations on improved policies, strategies and implementation guidelines for integrated water resource management.

3.0 Projects Supported under SGF

3.1 The SGF Sub-programme broadly supported the following two types of activities:

(i) Pilot Projects

- (a) that are Non-government Organization (NGO) and community led initiatives;
- (b) that are replicable and can impact policy dialogue or trigger larger initiatives; and
- (c) that have the potential of leading to greater investment.

(ii) Learning Products

- (a) that document innovative and best practices for wider dissemination in the sector;
- (b) that lead to new knowledge which could contribute to sectoral development; and
- (c) that stimulate policy debate or lead to policy reforms in the sector.

3.2 Typically, projects that can be completed in one year with a maximum investment of US\$ 30,000 (about Rs.14 lakhs) were to be supported under the SGF Sub-programme.

4.0 Institutional Arrangements

4.1 The Sub-programme was to be executed in accordance with the July 1998 'National Execution Guidelines (NEX) for UNDP Assisted Projects in India'.

4.2 The Executing Agent for the Sub-programme was the MoEF and the Implementing Agent, the WSP-SA. The Executing Agent was required to establish a Steering Committee chaired by a senior official of MoEF, with appropriate representation from DEA, other key ministries, UNDP, NGOs and a representative of the Implementing Agent, the WSP-SA. The National Programme Director (NPD) appointed by MoEF for the Environment Programme was to be the Nodal Officer for overseeing the implementation of the Sub-programme.

4.3 The Implementing agent was to be responsible for the procurement and delivery of the Sub-programme inputs and their conversion to Sub-programme outputs and for the day-to-day management and operation of the Sub-programme.

5.0 Selection of Organizations for Projects

5.1 The SGF Sub-programme laid special emphasis on the selection of organizations for projects sanctioned under it. NGOs and Community Based Organizations (CBOs) and other resource institutions were to be encouraged to apply. The Steering Committee was also authorized to approach reputed organizations having proven track record directly.

5.2 A strict selection criteria covering, among other things, such aspects of the applicant organizations as the legal status, track record, audited accounts and competent staff was to be adopted.

6.0 Need for Evaluation of the SGF Sub-programme

6.1 According to the UNDP, the progress of the SGF Sub-programme has been satisfactory, though there has been some delay in implementing some of the activities. The UNDP and the MoEF decided to have an evaluation of the effectiveness of the programme in terms of achievement of objectives and capacity building at local, sectoral and regional levels. The evaluation was also intended to make detailed recommendations on the lessons learnt and sharing of experience within and outside the country. More importantly, the recommendations were to include, *inter-alia*, a broad policy framework emerging from the experience gained from this sub-programme for efficient management of water and sanitation sector.

6.2 In terms of the Contract No. SSA/2004/143 dated 1 June 2004, The Author of this report, Shri R.P. Sharma was appointed as Consultant for the 'Terminal Evaluation of the Project – Small Grants Facility for Water Sector'. A copy of the C.V. of the Consultant is at ***Annexure I (Page 56)***.

6.3 The evaluation was to commence from 7 June 2004 and was to be completed in two months by 6 August 2004. A copy of the Terms of Reference (TOR) of the assignment is at ***Annexure II (Page 61)***. According to the TOR, the Consultant was to undertake field visits in respect of 7 of the 20 projects sanctioned under the SGF Sub-programme. The list of these projects is at ***Annexure III (Page 65)***.

7.0 Methodology of Evaluation

7.1 Document Review

In order to gather information on various activities taken up under the SGF Sub-programme, a detailed review of the following documents and literature was undertaken:

- (i) Tri-partite Agreement on the 'UNDP Sub-programme on SGF for Water Sector' dated March 1999;
- (ii) Narrative Report of the Water and Power Consultancy Services (India) Ltd (WAPCOS), the National Host Institution (NHI) dated 8th March 2004 on the SGF Funded Projects;
- (iii) NEX guidelines for the UNDP assisted programmes in India;
- (iv) SGF Sub-programme guidelines;
- (v) Role of various institutions in the programme implementation and procedure followed for selection of projects and NGOs;
- (vi) Final Completion Reports of the 7 projects where field visits were undertaken in particular and of the remaining 13 projects in general;
- (vii) Website of MoEF for gaining information on the present legislation relating to control of water pollution and handling of Municipal Solid Waste;
- (viii) Support Manual of MoEF for management of Municipal Solid Waste (Management and Handling) Rules 2000;

- (ix) Notification dated 7 July 2004 of MoEF on the mandatory environment clearance for new construction projects;
- (x) Websites of the Ministry of Rural Development (MoRD) and the Ministry of Agriculture for gaining information on the ongoing programmes viz. Integrated Watershed Management, Accelerated Rural Water Supply, Total Sanitation Campaign, Drought Prone Areas Programme, Desert Development Programme etc.;
- (xi) Website of the Sulabh International for gaining information on the current status of sanitation in India;
- (xii) Website of the Centre for Science and Environment (CSE) for gaining information on the current status of rainwater harvesting activities; and
- (xiii) Literature published by RUCHI, an NGO based in Himachal Pradesh, on watershed management, rainwater harvesting, soil conditioner terra-cottem, ferro-cement tanks, vermi-compost, self-help groups etc.

7.2 Discussions

7.2.1 With a view to gathering information on the procedures and institutional arrangements set up by UNDP, MoEF and the NHI for monitoring the Sub-programme, a series of discussions were held with the following officials:

- (i) Shri S.K. Joshi, then Director, MoEF
- (ii) Shri Ravi Chelem Associate Programme Officer, UNDP
- (iii) Shri Anil Arora, Assistant Programme Officer, UNDP
- (iv) Shri U.P. Srivastava, Consultant, WAPCOS and the Nodal Officer for the SGF Project

7.2.2 Discussions were also held with some of the officials of the Department of Drinking Water Supply of MoRD and the Central Ground Water Authority (CGWA) for gaining information on the ongoing programmes in the water and sanitation sector. Officials dealing with rainwater harvesting in the Centre for Science and Environment were consulted.

7.3 Questionnaire

An exhaustive questionnaire for gaining information from the NGOs and beneficiaries on various activities taken up under the projects was prepared. The questionnaire covered all the issues included in the TOR, besides other relevant information necessary for the evaluation. A copy of the questionnaire is at ***Annexure IV (Page 66)***. To save time, the questionnaire was sent to the NGOs in advance.

7.3 Field Visits

7.3.1 Though desirable, due to shortage of time, it was not possible to take up field visits in respect of all the 20 projects. As such, the TOR stipulated visits to 7 project areas only as listed at ***Annexure III (Page 65)***.

7.3.2 In view of this limitation, detailed impact analysis of only these 7 projects was possible. The evaluation of the remaining 13 projects is based on the information obtained from the NHI.

7.3.3 Besides discussions with the individual NGOs and their other staff, interviews with the beneficiaries and meetings with the stakeholders and members of the community were held at every place during the field visits. The list of persons met during the field visits is at *Annexure V (Page 68)*. Depending upon the logistics, attempts were made to inspect as many facilities as possible in the project areas.

7.3.4 Among other things, the main focus during the field visits was on eliciting information on the following aspects:

- (i) How far the programme objectives have been achieved;
- (ii) Benefits reaching the women and BPL groups;
- (iii) Capacity building of the beneficiaries to manage local water stress situations with regard to water supply or quality, safe disposal of human waste and environmental degradation;
- (iv) Extent of community participation in the project; and
- (v) Sense of ownership of the project developed amongst the community members;

7.3.5 Discussions with the District Administration at Ernakulam and Member Secretary, State Pollution Control Board, Himachal Pradesh for gaining information on the government policies and programmes in the water and sanitation sector and on pollution abatement respectively were attempted. It was not possible to meet the district officials at other places either due to their non-availability or constraint of time.

7.4 Review of Draft Report

A presentation on the draft evaluation report was made on 25.8.2004 in the office of UNDP. The presentation was attended, among others, by the Joint Secretary (CS) of MoEF, Deputy Resident Representative and Assistant Resident Representative and other officials of UNDP. Several useful suggestions emerged from the presentation meeting for incorporation in the final report.

8.0 Review of Procedures and Institutional Arrangements

8.1 Project Monitoring Agency

8.1.1 Following the signing of the tripartite agreement in March 1999, the physical implementation of the Sub-programme began immediately thereafter. Initially, as envisaged in the agreement, the WSP-SA worked as the NHI for implementation of the project. One Shri A.K. Pandhi of the WSP-SA was given the responsibility of implementation of the Sub-programme. However, as the programme involved a small investment and in view of their preoccupation with other priority areas, the WSP-SA decided to quit on 31.12.2000.

8.1.2 It took about 6 months (till June 2001) for the Steering Committee to appoint the WAPCOS, a Government of India Undertaking of the Ministry of Water Resources, as the next NHI for implementing and monitoring the project. WAPCOS continued as NHI till the completion of the project.

8.1.3 Shri A.K. Pandhi has since left the Delhi Office of the WSP-SA and as such his views on the issues related to the initial implementation period could not be obtained.

8.2 Role of NHI in Project Monitoring

8.2.1 WAPCOS informed that the overall coordination of the project was at the level of Chief Engineer and Deputy Chief Engineer who were associated on part time basis only. During the initial 6 months after they were appointed the NHI, the project was monitored by one Shri P.C.Mathur. However, from December 2001 onwards, Shri U.P. Shrivastava, Consultant was assigned the work of monitoring on a full time basis. Shri Shrivastava is MSc. in Geology and retired as Regional Director, Eastern Region Kolkata of the Central Ground Water Board. He has experience in ground water exploitation, watershed development and artificial recharge of ground water. Shri U.P. Shrivastava was assisted by two engineers and a data entry operator.

8.2.2 Altogether 20 projects have been sanctioned under the SGF Sub-programme. WAPCOS informed that 9 projects as listed (along with their approved cost-SGF share only) at **Annexure VI (Page 70)** had been approved prior to their joining the Sub-programme. The list (along with the approved cost-SGF share only) of the remaining 11 projects sanctioned during their (WAPCOS) period is at **Annexure VII (Page 71)**. The NHI informed that of the 9 projects sanctioned earlier, 4 had already been completed by June 2001 when they joined the programme and that their monitoring was limited to the 11 projects only, which were approved during their period.

8.2.3 The theme and guidelines issued for the Sub-programme were the cardinal points of its implementation and monitoring process. The methodology also focussed on community participation and gender consideration to promote the role of women in the Sub-programme. Areas with extreme climatic characteristics like draught-prone and snow-covered locations were given priority while selecting the projects.

8.2.4 No open advertisement or preparation of an exhaustive mailing list was attempted to seek wider participation of NGOs/Organizations in the programme from across the country. However, even without this, over 60 proposals were received during a period of two-and-a-half-years, which is considered a good response. Priority was given to those projects, which had replication potential not only in that area but also in other parts of the country.

8.2.5 The draft proposals were scrutinized by the NHI in terms of the guidelines and the aforesaid selection criteria and put up for the approval of the Steering Committee, which met twice a year. However, towards the later phase of the sub-programme, the Steering Committee decided to appoint a Sub-group for a further technical scrutiny of the draft proposals before these were put up for its approval.

8.2.6 Baseline survey is an important activity for any project, small or big, to evaluate its impact. In this case, no baseline surveys were undertaken in any of the project areas. This was a shortcoming of the monitoring process.

8.2.7 A total of 20 field visits were undertaken by the NHI for monitoring the physical and financial progress of approved works. The details of the field visits are at **Annexure VIII (Page 73)** While two project areas were visited thrice and five project areas twice,

only one field visit was undertaken in respect of the remaining four project areas. Generally the first visit was undertaken on the scrutiny of the concept plan of a prospective project proposal to verify, *inter-alia*, the following:

- (i) Whether the project is demand driven and has replication potential;
- (ii) The extent of community's interest in the project;
- (iii) How it will address the problems facing the community; and
- (iv) The capabilities of the NGOs concerned.

8.2.8 It was only after a project proposal fitted into these guidelines that it was put up to the Steering Committee for approval. The second field visit was taken up about 6 months after the project approval and signing of agreement with the concerned NGO when 40% of the funds were also released. This visit provided an opportunity to the NHI to see whether the project was progressing as planned, funds being utilized properly and whether any modification in the methodology was required. In addition, the NHI was always in touch with the NGOs over telephone throughout the project implementation period.

8.2.9 Funds to the NGOs were released in three installments. The first installment amounting to 40% of the sanctioned cost of the project was released upon signing the agreement. The second installment of another 40% of the cost was released after submission of the utilization certificates and the commensurate physical progress. The final payment of the remaining 20% of the sanctioned cost was released only after submission of the project completion report, utilization certificates and other relevant documents.

8.2.10 The NHI provided a number of technical inputs to the NGOs and the community to ensure that the projects fulfilled the programme objectives and attained sustainability. The inputs covered a host of issues, some important ones being:

- (i) Protection of shoulders at either end of the check dam, provision of a spillway and an educational tour for the community to the Central Grass and Fodder Research Institute (CG&FRI), Jhansi in the Salaita project;
- (ii) Increase in the capacity of the FC tank, provision of additional gully plugs to increase the water flow to the check dam and replacement of bench terracing with staggered trenches in the Rajgarh project;
- (iii) Further deepening the pond bed to remove silt, provision of a rectangular cattle trough and further treatment of inlet channel and the catchment area of the pond in the Sinsini project; and
- (iv) Provision of gabion structures at the inlet channel, vegetative cover at the pond embankment and construction of open dug wells with cover for installation of hand pumps in the Sundargarh project.

8.2.11 The detailed list of project-wise technical inputs provided by the NHI is at **Annexure IX (Page 75)**. The NGOs and the members of the community were generally appreciative of the guidance and technical inputs provided by the NHI during the project

implementation. However, many suggestions could not be implemented due to limitation of funds.

8.2.12 On the basis of the feedback received from the project proponents and keeping in view the diverse nature and spread of the sanctioned projects, short of baseline surveys, the performance of WAPCOS as NHI is considered fairly satisfactory. The Sub-programme being a small initiative, the deployment of staff for its monitoring was adequate. However, some difficulties were faced in retrieving the information needed for the review of the programme. The NHI attributed this to the withdrawal of the staff after completion of the programme and assignment of the nodal project officer on other projects. Nevertheless, if WAPCOS looks for more future programmes of this kind they need to improve their record keeping and to make use of **e-monitoring** to keep pace with the current trends.

8.3 Project Cost

The total cost of the 20 projects (SGF share only) works out to Rs.2.12 crore which is well within the grant provision of Rs.2.17 crore available for the programme. The sanctioned cost (SGF contribution) of each individual project was within the ceiling amount of US\$ 30,000 (about Rs.14 lakhs) stipulated in the SGF Sub-programme guidelines except the Salaita project which increased marginally due to sanctioning of certain additional works later. It is, however, seen that beneficiaries' contribution, which is essential for ensuring their participation in the programme, was not clearly envisaged at the time of approval of the programme. Even at the time of appraisal and sanctioning of individual projects, there were no clear guidelines on cost sharing. As such, the community's share was not uniform and in the 7 projects, where field visits were undertaken, it varied from 8% to 24% of the project cost. In some projects the NGOs have also contributed in the cost.

8.4 Completion Period

8.4.1 According to the SGF guidelines, all projects were to be completed in 12 months from the date of sanction. Barring a few cases, most of the projects were completed within this timeframe.

8.4.2 It has taken nearly 5 years to complete the programme. Initially, the Sub-programme was to terminate on 31.12.2002. However, due to (a) delay of about 6 months in appointing the WAPCOS as NHI, (b) delay in submission of the necessary documents including the utilization certificates by some NGOs and (c) a rather long span of nearly two and a half years for submission of proposals, the completion date of the Sub-programme was extended to 31.12.2003.

8.4.3 It is, however, observed that the Water Conservation and Sanitation project in district Tehri Garhwal implemented by the Himalayan Seva Samity was approved as a special case only in January 2004 with a completion period of 3 months. The final completion report of this project is yet to be received by the NHI. The SGF Sub-programme, thus, closed on 31.3.2004.

8.4.4 Based on the completion dates furnished by the NHI, the year-wise completion of the sanctioned projects was:

Year	No. of Projects
2000	4
2001	5
2002	2
2003	8
2004	1
Total	20

8.4.5 During the field visits, several organizations attributed the time overrun in their projects to the delay in release of funds by the NHI. The WAPCOS clarified that release of funds was delayed only in those cases where the respective NGOs did not submit the necessary documents in time.

8.5 Role of National Steering Committee

8.5.1 The Steering Committee chaired by the Joint Secretary in-charge of the concerned Division in MoEF was responsible for sanctioning the proposals with the work-plan and approving the budget. The Steering Committee reviewed the programme biannually and gave directions to the NHI from time-to-time. The National Programme Director (NPD) oversaw the implementation of the Sub-programme on a day-to-day basis.

8.5.2 With a view to streamlining the selection procedure and ensuring proper technical scrutiny of the draft proposals, as mentioned in Para 8.2.5 above, a Sub-group was constituted on the direction of the Steering Committee. The draft proposals after the scrutiny by NHI were put up to the Sub-group for further technical scrutiny before submission for approval to the Steering Committee.

9.0 Review of Projects

9.1 As envisaged in the TOR, field visits were undertaken in respect of 7 projects only listed at ***Annexure III (Page 65)***. The dates of visits are also indicated against each project. These projects have been reviewed in detail according to the methodology described in Para 7.0 and detailed Evaluation Reports are at ***Appendix I (i) to (vii) (Pages 85-148)***.

9.2 In addition, WAPCOS provided only outline information on another 7 projects. Thus, the review included 14 out of the 20 projects sanctioned under the SGF Sub-programme.

9.3 In most of the water conservation and rainwater harvesting projects, the check-dams/ponds were empty at the time of field visits due to percolation of harvested water.

It was, therefore, difficult to make a direct assessment of the impact of such projects. Since there was no baseline data generated on the activities undertaken, a general perception of the pre-project scenario only was possible on the feedback obtained from the beneficiaries and NGOs concerned during the field visits.

9.4 The observation emerging from the field visits and review of projects are summarized below:

9.4.1 Projects where Field Visits were Undertaken

(i) Augmentation of Water Resource and Hygiene Facilities in Village Salaita, District Etawah, U.P.

[This is a brief account of project review. For more details, a perusal of Appendix I (i) (pages 85-95) is recommended]

- (a) The project area population is 1550. The project cost was initially estimated at Rs.13.75 lakhs. However, due to inclusion of certain additional works, the completion cost of the project was reported as Rs.17.60 lakhs, which consists of a SGF grant of Rs.15.79 lakhs (90%) and the community's contribution of Rs.1.81 lakhs (10%). The project was completed in 13 months. The delay of one month was attributed by the NGO to the delay in receipt of funds.
- (b) Main activities included a check dam, 40 toilets and 6 FC tanks. The check dam helped in recharging of 5 wells in the village which used to go dry for at least two months every summer and women were to walk about a kilometer everyday to fetch water. These wells started operating in the top summer months during the very first year of completion of the project. In addition one ancient well of heritage value has also been refurbished. Thus, the facility has helped in removing the drudgery of woman in a significant manner. The check dam has also helped in soil moisture retention in the agricultural fields. In the pre-project period, each farmer was spending an average Rs.1000 every year for watering the field before tilling. With the construction of the check dam, the farmers do not spend money for this purpose any more. According to the estimates of the NGO, the check dam has helped the water table to rise by about 10 ft. However, there is no baseline data to substantiate this fact except the extent of increase in the soil moisture retention. The entire population of the village has been benefited from the construction of the check dam.
- (c) The women of the village were found to be happy with the provision of toilets. Nearly 80% of the village population not having access to sanitary toilets has been covered. Of the 40 toilets, 2 units have been provided in the SC cluster, which accounts for 5% of the village population. Most of the toilets are being used extensively. However, some of the beneficiaries still use open areas for defecation. The Head of the Mahila Samity was requested to take up awareness campaign to educate the villagers about the benefits of toilet hygiene.
- (d) FC Tanks have been constructed on demonstration basis as the community had some reservations about their benefits in the beginning. Two tanks have been put

up in schools covering about 300 students and another 4 tanks in individual households, of which two are in the SC area.



Pitching and watering at the check dam

- (e) The community was involved in the decision making process from the beginning. They provided significant inputs in the selection of sites for various activities. The decision of constructing double pit toilets in place of the single pit ones was taken on the insistence of the community only. It took quite some time for the NGO to convince the villagers about the utility of the rooftop rainwater harvesting. This only indicates how intensively the villagers were involved in the project.
- (f) Participation of the community and the guidance of the NGO helped in achieving economy in the construction activities particularly in the check dam without sacrificing the quality. The construction of the check dam could be completed in 50% of the approved cost of Rs.400/m³. Institutional arrangements have been put in place to ensure the sustainability of the project.
- (g) The NGO established an effective networking with other reputed NGOs having expertise in similar works. They obtained technical advice on various project activities from reputed NGOs and R&D institutions. This improved the quality of delivery of various activities covered under the project.
- (h) The activities of public awareness, education, training and exposure tours were carefully selected keeping in view the needs of the villagers. Representation of women in this programme gave them an opportunity to understand the project better, which was instrumental in soliciting their participation in it. A one-year distance education course for 10 girls of the village was an innovative idea, which would help in providing job opportunities to the village women. A one-week health workers' course for another 10 girls was organized on health and hygiene. Three out-station exposure tours were arranged for beneficiaries which had a fair representation of women. This was the first opportunity for the women and girls to travel outside the village boundaries and helped in enhancing their vision. Altogether 40 persons participated in the exposure tours and training programmes.



Heritage well revived

A community well after recharging



- (i) One of the important lessons learnt from this project is that earthen check-dams are not suitable in sandy soils. The best option in such places is to go for a brick masonry dam.
- (ii) **Sustainable Development of Tal Maharaja Badan Singh for Drinking Water Supply in Sinsini Village, District Bharatpur, Rajasthan**

[This is a brief account of project review. For more details, a perusal of Appendix I (ii) (pages 96-103) is recommended]

- (a) The population of the project area is 14800. The completion cost of the project is Rs.14.17 lakhs, which comprises SGF grant assistance of Rs.9.58 lakhs (67.6%) from UNDP, community's share of Rs.1.40 lakhs (9.9%) and that of the NGO as Rs.3.19 lakhs (22.5%). The project was completed in 12 months.
- (b) The main objective of the project was to revive an over-400-year-old pond and recharging and refurbishing of the 6 wells along its periphery. These wells are the only source of drinking water for the community. The other wells in the village have brackish water and as such are not fit for potable use. During the pre-project period, these wells used to go dry for at least two months in summer and village women had to walk nearly 1.5 km. everyday to fetch water for the family. Every family was spending an average Rs.10/day for buying drinking water. The project has changed the scenario. The population covered under this project no more spends money for buying water. Though there is no baseline data to indicate the rise in the water table, feedback given by the beneficiaries indicated that all the 6

sweet water wells remained fully operative during the very first summer season after the implementation of the project.



Women fetching water

Villagers deepening the pond water



- (c) Nearly 50% of the population of the village i.e. about 7000 people are reaping the benefits of the project. Women have to walk a small distance to fetch water. The project has, thus, helped in removing the drudgery of the village women, who are able to use their saved time in other income generating activities and in better managing the SHGs constituted under the project.
- (d) The beneficiaries informed that though the wells have sufficient water to meet the demand of the entire village, the distance of the remaining half village territory from the project site is a bottleneck. The villagers are, therefore, eagerly looking for the minimum arrangements of bringing the water from the wells to the village through a pipe. The necessary storage and distribution network already exists in the village.
- (e) The NGO, promoted by the pharmaceutical giant Lupin Laboratories, has been very active in the area. They have contacts at the grass-root level in the villages. The NGO involved the community in the decision making process from the beginning. Active participation of the community in the implementation of the project helped in bringing down the cost of excavation of earth from the standard government rate of Rs.21/m³ to Rs.16/m³. The villagers provided important inputs on the water harvesting possibilities in the excavated pond.



Revived Maharaja Badan Singh Pond

Refurbished wells



- (f) SHGs for women and O&M Committees have been put in place to make the project sustainable and increase the income levels of the community. Pisciculture is proposed in the pond, which is expected to give good returns to the community. Part of the revenue generated from this activity would be utilized to maintain the facilities created under the project.
- (g) The survival rate of plantation done on the dykes was, however, very low. The NGO was advised to plant more trees in the coming monsoon with proper protection.
- (h) The villagers were seen deepening the pond further with their tractors to increase its retention capacity. There could be nothing more convincing than this to demonstrate their sense of ownership of the project.
- (iii) Sustainable Development through Water Conservation in Pairvi Khud Micro Watershed Area; Rajgarh, District Sirmaur, Himachal Pradesh**

[This is a brief account of project review. For more details, a perusal of Appendix I (iii) (pages 104-113) is recommended]

- (a) The population of the project area is 1600 with nearly 60% of it belonging to SC category. The project has been completed at a cost of Rs.13.73 lakhs. This includes a grant component of Rs.10.43 lakhs (76%) from the UNDP and Rs.3.30

lakhs (24%) from the community. The project was completed in 13 months with a one-month time-overrun. The delay was reported due to the delayed receipt of SGF grants.

- (b) The main objectives of the project were to harvest rainwater for agriculture and drinking purposes, planting of trees to meet the fuel and fodder requirements of the villagers and demonstration of a polymer based soil conditioner, Terra-Cottem for soil-moisture retention. The project was demand driven and aimed at mitigating the water scarcity problems of the Ser-Jagas Panchayat area.
- (c) Construction of a check dam, farm ponds and percolation ponds have helped the farmers significantly in enhancing the water availability for agriculture and in turn increasing their agricultural income. The check dam with a storage capacity of 5 lakh litres would benefit 25 families in Gheel village besides recharging groundwater. These farmers would be able to cultivate additional 25 ha. of land hitherto lying wasteland. Two farm ponds in Ser and Neri villages would help in cultivating additional 10 ha. of wasteland and benefit another 25 families. During the field visit, two families of Neri and Ser villages were interviewed. They informed that their annual income had increased from Rs.30000 to Rs.50000 per year as a result of additional cultivation of land through farm pond water.



Check Dam

Farm pond



- (d) The Ferro-cement tanks were successful in harvesting rooftop rainwater and have been very effective in addressing drinking water problems of several families in the project area. A total of 31 families representing 10% of the population have been benefited by the construction of 10 FC Tanks. Of these, 8 families belong to BPL category. The facility was provided on the specific request of the Mahila

Mandal of Ser village. The beneficiaries now get the drinking water right at their doorstep instead of going through the drudgery of walking everyday at least 500 meters up the hill to fetch water.

- (e) However, due to geographical constraints, only 50% of the population of the Panchayat could get the benefits from the project. Construction of more check dams, ferro-cement tanks and farm ponds was, therefore, a common demand of the people of the Panchayat. Another request of the people is in respect of provision of GI pipe for conveying the stored water to the fields. Presently, they use PVC pipes, which have a very short life due to extreme climatic conditions that prevail in the hilly areas.



A beneficiary family-Neri

A battery of FC tanks



- (f) The availability of proper sanitation facilities in the Panchayat area is far too short. There is a considerable demand of toilets from the community. Therefore, integration of water conservation projects with sanitation would be a desirable step.
- (g) Terra-Cottem is a multi-purpose soil conditioner extremely useful in soil-moisture retention (nearly 100 times of its weight), reduction in fertilizer application by 50% and increasing the overall plant productivity. A wide demonstration of the polymer application was conducted involving 125 farmers representing 38% of the project area population. Although the demonstration was quite successful, its application was not found economically viable in the hilly areas of Himachal Pradesh which supports marginal farmers only. The NGO reported two reasons for its low acceptability. Firstly, the initial cost of the polymer (Rs.500/Kg.) is beyond the means of an average farmer who is from the

low-income group. Secondly, the polymer comes over the surface during the tilling operation in the fields, and in that case its water retention capacity is no more beneficial to the plant root system. According to the NGO, this polymer is more suited to big farmers. The farmers in the hilly areas would rather prefer core facilities like check dams, farm ponds etc. which have practically no recurring cost.

- (h) A total of 10500 Devdar, 4000 Mulberry and 500 Willow plants were planted, most of which was under community plantation. Women were actively involved in this activity. About 20000 grass root plants comprising species like Lahsunia and Napier/Sterea were distributed to women for growing in their own land. However, some shortcomings were observed in this activity. Firstly, the survival rate was only about 50% and secondly, nearly 1000 plants under private plantation category were burnt due to forest fire. This is a common problem facing the forest areas. Proper supervision and an alert community can only help averting such incidences.
- (i) The NGO focused on the involvement of the community in the implementation of the project. This was accomplished by educating the beneficiaries through training camps, exposure tours and workshop. Two training camps and two exposure tours for the community were arranged which were attended by more than 100 farmers. The community was involved in the process of site selection and capacity/design for various facilities. Locally available materials and labour were utilized in the construction activities.
- (j) Organization of a workshop on the watershed management techniques and agriculture extension was a successful event. The workshop was attended by nearly 80 farmers from 10 watershed committees, village Pradhans and village officers of the area. Among the participants, there were a good number of women who contributed in a healthy discussion on the related subjects. Besides the discussions on the activities covered under the projects, the participants also shared their views on other income generating activities like floriculture, which has a tremendous potential for the rural poor of the area.
- (k) Three SHGs, two of women and one of men, have been formed in the project area. Part of the income generated through this activity would be utilized for O&M of the assets.
- (l) RUCHI, which has implemented the project, is an active and popular NGO of Himachal Pradesh. The NGO has grass-root contacts at the village level across the State. It has implemented a number of projects on watershed management and rainwater harvesting in the State. The watershed projects at Shilanjhi and Jagherkhud are regarded as the best practices in this field. The NGO was of the view that such projects should have more time for implementation rather than rushing through 12 months. According to them, it takes a great deal of time to convince the community about the long term benefits of such projects and it is after that step only that the participation of the people can be ensured.

(iv) Sustainable Development of Industrial Estates of Himachal Pradesh through Joint Industrial Planning & Management

[This is a brief account of project review. For more details, a perusal of Appendix I (iv) (pages 114-119) is recommended]

- (a) Unlike other projects of water conservation and sanitation covered under the SGF Sub-programme, this project is a study of the state of water pollution in four of the 20 industrial estates of Himachal Pradesh. The estates are Baddi-Barotiwala, Parwanoo, Mehatpur and Kala Amb. The industrial and municipal activities in these areas lead to the pollution of 4 rivers, namely: Kaushalya, Markanda, Swan and Sirsa.
- (b) The total number of industries in the 20 industrial estates of the State is about 27175 comprising 27000 of small-scale and 175 of medium and large-scale category. Of these, 876 industries -- 741 small-scale and 135 large and medium-scale -- are located in the 4 estates comprising the project area.
- (c) The objectives of the Study were to (a) prepare a status report of water pollution, (b) identify the sources of pollution, (c) make the stakeholders aware of the industrial and municipal activities responsible for pollution and (d) involve the stakeholders through a process of the Joint Industrial Planning and Management (JIPM) in addressing the issues involved.
- (d) The Study has been conducted by the Himachal Pradesh State Environment Protection and Pollution Control Board (HPSTEPPCB). An expenditure of Rs.13.27 lakhs has been incurred on it. The entire amount has been provided as a grant under the SGF Sub-programme. However, the additional cost of sampling carried out for industrial effluents has been booked to the industry, which can be considered as their contribution in the project.
- (e) The project agency prepared an elaborate plan for sampling and analyzing the pollutants. A total of 122 sampling points were identified in the four estates to assess the extent of pollution. The sampling points were carefully selected to cover all possible sources of pollution of surface as well as ground water. With a view to ensuring representative sampling, collection of samples was spread over the four seasons of a year. Samples were analyzed in the well-equipped laboratory of the HPSTEPPCB at Parwanoo for a wide range of physico-chemical and bacteriological parameters to determine all kinds of pollutants generated from the study area.
- (f) It took 18 months to complete the Study. The delay of 6 months was attributed to the inclusion of ground water sampling and analysis work which was not there in the original proposal.



A polluting drain – Baddi-Barotiwala

A polluting industry – Parwanoo



Another polluting drain

State-of-the-art-lab-Parwanoo



- (g) The agency arranged two workshops, the first in April 2002 at Baddi-Barotiwala, the largest of the four estates and the second one in November 2002 at Parwanoo. The participants in these workshops included representatives of the industry, development agencies, government officials, local bodies, NGOs and senior citizens. Nearly 200 participants attended these workshops. Several seminars/meetings with the stakeholders were organized during the study period to solicit their participation in the programme. In addition, prior to and on the World Environment Day on 5 June 2003, activities like quiz, poster competitions, debates, mass awareness campaigns etc. were organized for school children in all the four areas. Vehicular pollution monitoring campaigns and cleanliness drives were undertaken as part of awareness programme.
- (h) The outcome of the Study is an elaborate database and a comprehensive State of Environment Report of the area, which should be useful in implementing the JIPM in the near future.
- (i) One of the inconsistencies observed during the field visit was in respect of the colour and odor of the effluents flowing in the drains. The wastewater gave a look of untreated effluents, which put a question mark on the claim of the HPSTEPPCB that all industries have individually put up effluent treatment plants and only treated effluents are discharged into the drains.
- (j) Another limitation of the project was in respect of the pollution generated by the municipalities. Nowhere in the project area exist the necessary and adequate facilities for sewage treatment or handling of municipal solid waste. These are just dumped in the surface drains and account for a much larger share of pollution of rivers than the industrial effluents. The local bodies have no money to address this problem. This is a common problem facing the large towns and cities across the country. Therefore, even if the industry is made disciplined, the problem of pollution of rivers cannot be addressed unless the pollution sources like sewage and municipal solid waste are tackled.
- (k) Thus, the implementation of the findings and recommendations of the status report, which was the ultimate objective of the project, would depend on the financial resources with and the political will of the State Government.
- (l) A number of legal instruments are in place under the umbrella Environment Protection Act 1986 of MoEF to monitor and control water pollution from industrial/domestic wastes and municipal solid waste (MSW). These, *inter-alia*, include a recent Notification dated 7 July 2004 on new construction projects and MSW (Management and Handling) Rules 2000. In addition, MoEF is also supporting river-cleaning works under its flagship scheme of the National River Conservation Plan (NRCP). MoEF may consider taking up the action plan prepared by the HPSTEPPCB with the State Government for its implementation under the existing legislation.

(v) **Participatory Sustainable Land and Water Use Management in Macro-watershed Sanwalia in village Kothun, Chaksu Block, District Jaipur, Rajasthan**

[This is a brief account of project review. For more details, a perusal of Appendix I (v) (pages 120-129) is recommended]

- (a) The project area population is 2430 of which the SC population is about 5.5% only. The project has been implemented by the Indian Institute of Rural Management (IIRM), Jaipur, which is a non-government society. The expenditure incurred on the project is Rs.15.44 lakhs out of which the share of SGF grant is Rs.11.89 lakhs (77%) and that of the community and the NGO as Rs.1.19 lakhs (8%) and Rs.2.36 lakhs (15%) respectively. The project was completed five months behind the scheduled period of 12 months on account of non-availability of labour due to their pre-occupation in the sowing of crops.



Anicut at Kuthun

Eager community for a second anicut



- (b) The main objectives of the project were to harvest rainwater runoff to increase the water table and to take up soil conservation measures in the agricultural fields with a view to increasing the agricultural production.
- (c) To that extent, the construction of large anicut and 17 drop spillways has helped in achieving the objectives fairly well. These facilities have been able to service about 30% of the village land facing acute water scarcity. There are 52 wells in the command area of the project. The data of the water table for the pre and post project periods indicate that the anicut has helped the water table rise from 1' to 2' in these wells. As a result, with the availability of extra water, the farmers

were able to cultivate about 30% to 40% extra land which increased their agricultural income proportionately. Nearly 60 farmers have been benefited by the anicut.

- (d) Construction of 17 drop spillways and bunding of the fields has helped as many number of farmers in checking the soil erosion from rainwater runoff in a significant manner. In addition, the bunding activity has helped in retaining good quality silt in the fields which comes with the runoff.



A recharged well

Ramp-cum-weir



- (e) One of the innovative ideas coming from the farmers is the construction of a ramp-cum-weir in a cart carriageway. This is a low cost option serving a dual purpose. Firstly, it helps in storing rainwater upstream of the ramp and as such in recharging the ground water and, secondly, the activity helps checking the soil erosion due to runoff. The NGO informed that they only helped the community in preparing the plans. The community did the implementation of the project by itself. This only indicates of the level of community participation in the project and how it has led to enhancing the capacity of the people in addressing the stress situations. However, as mentioned earlier, due to shortage of funds, the project with one anicut is able to service only about 30% of the land holding of Kothun village.
- (f) The popularity of the project can be well imagined from the fact that nearly 40 elderly people of the nine nearby villages surrounded the Consultant during the site visit and strongly pleaded for a similar anicut with 50 spillways in their area. These facilities, if provided, would facilitate recharging of at least 400 wells and bring prosperity in the area. The cost of the project is estimated at Rs.39 lakhs.

The villagers insisted on the NGO to submit the proposal to the UNDP for replication of the project. A copy of the request letter from the IIRM to that effect is attached to the Evaluation Report placed at **Appendix I(v)**.

- (g) The IIRM prepared and implemented an elaborate plan of awareness and training of the farmers as a step towards capacity building of the community. Training programmes were arranged and literature distributed on such aspects as construction methods and procedures, better water management practices, adoption of inputs for increasing agricultural productivity, land reclamation, agro-horticulture and silvi pasture. Farmers were also taken around the Phagi Centre of the IIRM for practical training on subjects like vermi-compost, compost pits and Nadeep compost. Slogans at prominent places and putting up of hoardings in the village were also part of the awareness programme.

(vi) Sustainable Management of Wetlands in Dharbhanga, North Bihar

[This is a brief account of project review. For more details, a perusal of Appendix I (vi) (pages 130-139) is recommended]

- (a) This project is a Study taken up with the objective of developing strategies for sustainable management of Makhana (botanical name: ***Euryala ferox***) cultivation in North Bihar and improving the economic conditions of the Mallah community engaged in the cultivation. The Mithila Samajik Evam Arthik Vikas Sansthan (MSEAVS), a Darbhanga-based NGO having expertise on the subject, was commissioned for the Study.
- (b) An expenditure of Rs.3 lakhs has been incurred on the Study. The Study took 15 months against the sanctioned time of 12 months mainly to accommodate the seasonal requirements for data collection.
- (c) Makhana is grown in 9 districts of North Bihar. Of these, the species is prominently cultivated in Darbhanga and Madhubani districts. It is also grown in Manipur, Assam and Tripura in northeast. In Darbhanga district alone, there are nearly 1500 wetlands where Makhana is grown extensively. This Study has been conducted in three ponds in the Benipur Sub-division of the district about 40 kms. away from Darbhanga.
- (d) Cultivation of Makhana is done by the fishing community called Mallah. The population of the community in the district is about 3 lakhs. The community is part of 6-7 lakhs BPL population of the district. Unscientific agricultural practices resulting in lower yield, lack of knowledge in protecting the crops from pests and exploitation of the community by middlemen are some of the areas of concern which necessitated undertaking of this Study.
- (e) The role of the community was important in the data collection. Through the field visits undertaken for data collection, the NGO created awareness amongst the Mallah community on how the improved Makhana cultivation practice can help in improving their socio-economic conditions.

(f) The NGO has brought out a comprehensive report on the Study covering a huge database and academic information on the subject. The important findings emerging from the Study and the field visit are:

- ❖ Makhana provides a means of sustainable development of the Mallah community of North Bihar. It has a significant bearing on the regional economy. However, in the present system, ponds are settled in the names of influential middlemen and the community continues to remain a deprived class.
- ❖ Makhana cultivation is done in the derelict and abandoned ponds. Falling of plant leaves on the water surface and their decaying process results in decreasing the dissolved oxygen level in the pond water to nearly zero.
- ❖ For cultivation, about 1-meter deep pond is ideally suited. Crop rotation (Makhana with potato or wheat) and integrated aquaculture of Makhana with fish is possible by modifying the agronomic practices. These measures can enhance the income of the community by at least 30% from the same pond area.
- ❖ At present about 470 ha. of land is under Makhana cultivation in Darbhanga which can be increased to 5000 ha. with adequate scientific and financial support.
- ❖ Freight charged by railways for transportation is on volume and not by weight. Makhana pops being light in weight, this affects the income of the farmers adversely.
- ❖ Focus of the Department of Agriculture of the State Government to support and promote the cultivation is not visible which is one of the reasons for the continued exploitation of the community and unsustainable growth of this unique species.
- ❖ Packing of Makhana in polylined jute bags can protect the pops for a longer period from insects and moisture. Education and awareness programmes are needed to encourage the use of pesticides to protect the seeds from pests.
- ❖ The report should have also covered (a) the health aspects of the community, which has to work in the polluted water of Makhana ponds and (b) the analysis of Dissolved Oxygen (DO), Bio-chemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) without which it is difficult to assess the level of pollution in the ponds.
- ❖ A high profile workshop organized by the NGO was well attended by a large cross section of the stakeholders. The workshop covered the subject of 'Wetlands' in a rather broader perspective than concentrating over the specific issues related to the Makhana cultivation. The level of participants and the language of the workshop were also perhaps beyond the domain of understanding of a practically illiterate Mallah community.

- (g) The Study revealed that the Makhana cultivation in North Bihar was suffering due to neglect and apathy of the State Government towards this activity, although the area produces one of the finest varieties of Makhana in the country. Unless corrective steps are taken, this unique cultivation may soon vanish from Bihar.



Makhana pond

Makhana seeds



- (h) The Consultant helped the NGO in preparing an action plan based on the findings of the Study and observations emerging during the field visit which is part of his evaluation report (Para 11.6) placed at Appendix I (vi).
- (i) The outcome of the Study should lead to its logical conclusion for achieving the objective. MoEF may, therefore, consider forwarding the aforesaid action plan to the Government of Bihar for necessary action. In order to save this unique species from vanishing from Bihar, the measures suggested in the action plan need to be implemented with sincerity by the State Government.
- (vii) Popularization of Rainwater Harvesting through construction of Low Cost Ferro-Cement Tanks for Drinking Water Supply and Environment Preservation and Development of Sanitation Facilities through construction of Low Cost Sanitary Latrines in Ernakulam district, Kerala**

[This is a brief account of project review. For more details, a perusal of Appendix I (vii) (pages 140-148) is recommended]

- (a) This project consists of two components, namely; (a) construction of 60 rooftop rainwater harvesting structures and (b) provision of 50 toilets and 75 vermin-compost pits.

- (b) The project area comprises three Panchayats with a total population of about 63750. About 10% of the population belongs to the SC category.
- (c) The completion cost of the water harvesting project is Rs.18.66 lakhs, comprising SGF assistance of Rs.12.65 lakhs (67.8%), beneficiaries' contribution of Rs.3.75 lakhs (20%) and that of the NGO as Rs.2.26 lakhs (12.2%). The project was completed in just 10 months against the completion target of 12 months.



Interaction with community at Illithode

Proud owners of ferro-cement tank, Illithode



- (d) The NGO adopted an objective criterion for selection of beneficiaries for FC tanks and toilets. Among other things, preference was given to persons in BPL category, widows, persons having no access to water etc.
- (e) The completion cost of the sanitation project is Rs.3.42 lakhs, which consists of a SGF share of Rs.2.62 lakhs (76.6%) and that of the beneficiaries and the NGO as Rs.0.35 lakhs (10.2%) and Rs.0.45 lakhs (13.2%) respectively. The project was completed at a crash speed in just 70 days.



Vermi-composting

A beneficiary of toilet



- (f) The water harvesting structures have been found extremely useful in the area which is predominantly a hilly terrain. Although the area has a very high rainfall, runoff quickly flows down the sea leaving hardly any scope for water retention. Of the 60 tanks, 7 have been put up in schools and the remaining 53 given to individual families. The facility has benefited a population of about 5500, which constitutes about 10% of the population of the project area. These beneficiaries did not have access to drinking water.
- (g) The project has been able to remove the drudgery of women beneficiaries, who were to walk more than a kilometer during summer earlier for fetching water. Women are now encouraged utilizing the saved time to promote such income generating activities as backyard poultry, vegetable cultivation and tailoring.
- (h) The low cost toilet project has benefited 50 families, all belonging to BPL groups. In addition, 75 portable vermin-compost pits have also been provided under this component. These pits are useful in producing bio-fertilizers from garbage. The technology operates with special species of worms capable of biodegrading waste in about 40 days.



FC tank in an Anganwadi school

- (i) The quality of construction of both the FC tanks and the toilets was found to be very good. However, from the expenditure statement furnished by the NGO, the cost of each toilet works out to Rs.5000, which is high. In the Salaita project, the cost per unit is Rs.3900 only.
- (j) The NGO has developed an effective communication system at grass-root level in the villages through its Gramodaya units. Water Resource Committees with the representation of the community from each ward and members of the Gramodaya were constituted in the beginning of the project to analyze the problem and evolving sustainable solution.
- (k) The community was exposed to the rainwater-harvesting programme for the first time. Therefore, the NGO organized five awareness camps to educate the people about the benefits of the project. Nearly 650 participants attended these camps. Similarly, under the sanitation project, two awareness camps were organized, which were attended by about 220 participants.
- (l) The project has drawn overwhelming response from the community, which was evident from the attendance in the two meetings arranged by the NGO during the field visit of the Consultant. Nearly 30% of the population of the three Panchayats where the projects have been implemented does not have access to drinking water and sanitation. The beneficiaries, therefore, strongly pleaded for replicating the project. They were also willing to share up to 50% of the cost in the future projects.
- (m) The NGO was advised to have occasional quality checks of the harvested water to ensure its potability. The Fathers (Principals) of the two schools, where FC tanks have been provided and whom the Consultant met during the field visit, were advised to educate the students on water conservation and the use of sanitary toilets.
- (n) A meeting with the District Administration at Ernakulam was held for gaining information on the water and sanitation programmes being implemented by the State Government. Although the M/o Rural Development has a number of schemes in these sectors, the pace of these works is extremely slow and the rates allowed for construction of facilities are unrealistic. For instance, the estimated

cost of a twin-pit toilet is taken between Rs.625 and Rs.1000, out of which the GoI share is only a maximum of Rs.300 per unit. This is one of the reasons why people prefer implementation of such programmes through NGOs.

9.3.2 Review of the other 7 projects based on part information furnished by WAPCOS

(i) Techno-Economic Appraisal of Deep Infiltration Wells/Hand Pumps in Kumaon Himalaya, Uttaranchal

- (a) The project has been implemented by the Pan Himalayan Grass Roots Foundation, Ranikhet. The outlay approved for the project is **Rs.9.10 lakhs**. The project was approved in April 2000 with a 12-months time frame for completion.
- (b) The main objectives of the project were:
 - (a) To debate the location, construction, operation and maintenance of deep infiltration wells fitted with hand pumps;
 - (b) To demonstrate the feasibility of the developed technology in drinking water sector in Himachal Pradesh: and
 - (c) To analyze and document other innovative approaches being developed and practiced in the drinking water domain in the Kumaon Region.
- (c) Despite having above-normal rainfall, the entire hilly terrain of Himalayas experiences shortage of water particularly during summer months. Due to very steep slopes the rainwater runoff quickly flows down the hills. However, the phenomenon of seepage through weak planes viz. fissures, fractures, bedding, joint plane etc. helps in retention of runoff which are considered dependable sources of water supply in mountains. Such water sources have been effectively exploited in this project by using a deep infiltration well.
- (d) The technology is simple and easy to maintain. Locally trained people can do the entire construction. The technology has been field-tested in over 200 wells under varied conditions in the Kumaon Region. On the basis of the MoRD norm of one pump for 250 persons, project benefits reached nearly 50000 people.
- (e) A manual in simple language has been prepared for the field workers. Women SHGs are managing the O&M of the pumps. The technology has a great potential to address the problem of water scarcity in the Himalayan Region.
- (f) A workshop was also organized on the subject, which was attended by a large number of NGOs, Government officials and the members of the community. Finally, three sites in Himachal Pradesh were identified where construction of deep infiltration wells has been successfully completed.

(ii) Water Management in Cold Deserts

- (a) This innovative project has been implemented by a Gurgaon based NGO, Pragya in Poh village about 30 kms from Kaza in Spiti valley at an altitude of 3500

meters. The sanctioned outlay for the project is Rs.12.40 lakhs. The project was approved in January 2002 and was targeted to be completed by December 2003.

- (b) The project aimed at developing water management strategies in cold desert regions followed by a community based demonstration project in one of the cold desert pockets of the Spity Region.
- (c) The project could start in May 2002 only due to continuous snowfall till the end of April.
- (d) The area receives insignificant rainfall which is in the form of mild snowfall. Agriculture is the main source of livelihood for the tribal population of the area. Although snowmelt starts with the onset of summer, the water availability gets depleted by the end of June when the standing crops need the water most.
- (e) The project adopts an innovative approach of creating an artificial glacier in sun-shaded depressions to harness additional water for summer months beyond the month of June. A suitable site was identified in Poh village for the artificial glacier. The NHI has reported that during the winter season of 2002-03, an ice sheet having a thickness ranging from 1 to 5 meters was created in an area of about 270 m². The volume of the glacier was about 625 Kl.
- (f) The entire population of about 400 tribal remote mountainous community would be benefited by the project. The technique has a significant potential of replication in the cold desert areas of Himalaya.

(iii) Water Supply and Sanitation Projects for Bagi and Badalda villages in Chinyali Blocks, Uttar Kashi, Uttaranchal

- (a) The project was approved at a cost of Rs.12.79 lakhs in September 2002 and was to be completed in one year. The implementing Agency is the Himalayan Ecology and Treatment of Natural Agriculture (HITONA) of Uttar Kashi.
- (b) The project aims at addressing the acute water shortage problem in the villages and providing sanitary toilets to the families.
- (c) The population of the twin villages of Bagi and Badalda, located at an altitude of 1550 m, is 440 comprising 81 families. The area faces acute water shortage even to meet the drinking and household needs. Women are the worst sufferers. They have to face the drudgery of walking 4 to 5 hours daily to fetch drinking water for their families. Sanitary toilets are non-existent in both the villages.
- (d) Under the project, two natural springs within 1 to 1.5 kms. of these villages have been exploited in an attempt to mitigate the water problems of the villages. A collection tank-cum-roughing filter has been set up close to the springs. Water from this tank is conveyed through gravity to a clean water reservoir in the village provided with a chlorinator for distribution to the beneficiaries.
- (e) Under the sanitation component, double pit latrines have been constructed for all the 40 families of one of the two villages on 50% cost sharing basis.

- (f) The project is reported to have been completed with minimum investment with the community's initiative and participation in evolving sustainable alternatives to the water and sanitation problems.
- (iv) **Sustainable Development of Tribal Women through Management of Watershed (Land and Water Resources) in Jamkini Village, Himgiri Block, Sindergarh District, Orissa**
 - (a) The project has been implemented by a Bhubaneswar based NGO viz. Society for Rural Advancement and Democratic Humanitarian Action (SRADHA). The sanctioned outlay for the project is Rs.11.96 lakhs. The project was approved in September 2002 and was to be completed in 12 months.
 - (b) The project aims at community participation at all levels to deal with the water stress situations and to develop sustainable alternatives collectively to address the issues.
 - (c) The project was started by applying the Participatory Rural Appraisal technique for collecting relevant background information, identification of water and sanitation related problems, organization of general awareness and motivation camps for smooth functioning of various activities. This was followed by developing an Action Plan for implementation of the project.
 - (d) The response of the community was overwhelming once they realized the benefits that are likely to accrue to them on completion of the project. The community participated in the decision making process and organized shramdands for digging of ponds, trenches and wells and other watershed management activities like gully plugging, nursery raising and afforestation for harnessing and conservation of water. The project has benefited 125 families, all belonging to SC and BPL category. The community's participation inculcated the sense of ownership of the project and a satisfying experience in each member.
- (v) **Water Supply and Sanitation Project in 3 Villages of Thoubal District, Manipur**
 - (a) The implementing agency for the project is Wanging Women and Girls Society. The project was approved in December 2001 and was to be completed in 6 months. An outlay of Rs.13.10 lakhs has been sanctioned for the project.
 - (b) The project aims at providing safe drinking water and low cost double pit sanitary latrines in three villages of district Thoubal in Manipur. Involving the community, especially the women of the villages, in the project planning and implementation was one of the thrust areas.
 - (c) To address the water problems, three horizontal roughing filters and slow sand filters were constructed, one in each of the three villages. This facility provided safe drinking water to about 1500 families. In addition, four rooftop rainwater harvesting structures have also been constructed in one of the three villages with the active participation of the community.

- (d) Under the sanitation component, 137 low cost toilets have been constructed. The toilets have especially benefited the women and the girls of the three villages. In addition, two community toilets have also been constructed, one each in Khongjom and Wangjing Bazar.
- (e) As a step towards capacity building, 20 training sessions were organized for imparting training on the maintenance of the civil structures constructed under the project.
- (vi) Video Documentation of ‘Women’s Entrepreneurs in Water and Sanitation’**
 - (a) The project has been implemented by Vanangana, Karvi in U.P. The project was approved in November 1999 at an estimated cost of Rs.10.54 lakhs and was completed in March 2000.
 - (b) The project aimed at developing a 23 minute video film titled ‘Mechanics of Change’ on the role of women groups in the development, sustenance and management of water resources and sanitation facilities. The project was taken up as a follow-up action of a ‘Women Mela’ organised by the NGO in collaboration with UNICEF for sharing the experience of women groups working in the domain of water and sanitation.
 - (c) The video film is reported to vividly demonstrate the success stories of women entrepreneurs in water and sanitation (WATSAN) sectors. However, it is also necessary to make arrangements for its screening to a wider target audience to encourage the women groups to work in the WATSAN sectors for their empowerment.
- (vii) Sustainable Drinking Water Intervention in Puri District**
 - (a) The project was approved in April 2000 and completed in October 2000. The sanctioned outlay for the project was Rs.4.55 lakhs. The implementing agency is the F.M. Welfare Club, Puri, Orissa.
 - (b) The project aimed at developing a functional drinking water model in a coastal district in the aftermath of the super cyclone that lashed the Orissa coast in 1999 and destroyed, among other things, the water supply and sanitation system. Integration of sanitation component with the water development programme has also been attempted in the project. The project focused on community participation and gender sensitization.
 - (c) Sinking of deep tube wells for tapping fresh water aquifer, capacity building and training of the local people and creation of fund for O&M were the main outputs of the project. WATSAN committees have been formed for O&M of the assets on a sustainable basis.

10.0 Current Status of Rainwater Harvesting in India

10.1 The source of water on the earth is neither the river nor the underground aquifer and nor the lakes, wells or streams. Rain is the source of all water. In India, monsoon is brief. According to CSE, out of 8760 hours in a year, we get rains for an average 100 hours (all India average) only. Synergies exist between the rainfall, human population density and land availability. The water arithmetic shows that if all the rainwater is captured, it can meet the water needs of 68 persons in the rural arid zones and 1382 persons in the rural humid zones per day per hectare of available land. So huge is the potential of rainwater harvesting in India and yet so little has been done in this area. (*The data taken from the CSE Website*)

10.2 On the other hand, overexploitation of ground water for both drinking and irrigation purposes has resulted in the ground water levels going alarmingly low in most parts of the country. A total of 144* districts in 10* states, major ones being Punjab Haryana, Gujarat, Karnataka, Maharashtra, Rajasthan, Tamil Nadu and Uttar Pradesh, have been declared 'dark' and 'gray' zones. The Central Ground Water Authority (CGWA) is the nodal government agency under the Ministry of Water Resources for regulation and control of groundwater management and development. Despite the legislation being in place and banning of tube well drilling in notified areas, there is hardly any let up in the depletion of groundwater aquifers. (* *Source: ARWSP latest guidelines*)

10.3 Concerned with the growing problem of water, the CGWA has now taken up initiatives to promote rainwater harvesting in the country. States like Kerala, Delhi, Tamil Nadu, Haryana, Rajasthan and Gujarat have already introduced legislation on rainwater harvesting. Pro-active local bodies in places like Indore (M.P.), Kanpur (U.P.) and Hyderabad (A.P.) have also made the rainwater harvesting mandatory in all new constructions. However, this legislation is at present mostly limited to urban areas only.

10.4 According to the MoRD, about 85% of the drinking water needs are met from ground water at the national level. In the rural areas there is nearly 100% dependence on the groundwater for this purpose. Considering a population ratio of 75:25 between the rural and urban India and taking a water supply rate of 40 lpcd for rural and an average 100 lpcd for urban population (in Delhi it is 250 lpcd), the impact on groundwater level depletion on account of drinking water alone is 63% due to rural areas as compared to 37% of the urban areas. Secondly, due to rapid development in the groundwater-based irrigation, it accounts for nearly 90% of ground water abstraction as compared to only 5% needed for domestic water supply. Therefore, the impact of groundwater abstraction for irrigation purposes is nearly 18 times more than that for the drinking water. The demand in rural areas is expected to increase sharply as the development programmes improve economic conditions of rural masses. As a result, water, which is a scarce resource, would become even scarcer in future. Yet, there is hardly any focused programme as on date on rainwater harvesting and ground water development in rural areas except some small projects having been undertaken under the ARWSP and a small Central Sector Scheme of the Ministry of Water Resources implemented in 27 States at an expenditure of Rs.33 crore during the IX Five Year Plan.

(*Source: ARWSP latest guidelines*)

10.5 According to the CGWA, a Centrally Sponsored Scheme on rainwater harvesting with an estimated outlay of Rs.165 crore was proposed under the X Five Year Plan. However, the scheme has not been approved so far. Cost sharing under the scheme has been proposed in the ratio of 75:25 between GoI and States. Community contribution would be to the extent of 10% in the O&M cost only.

10.6 The National Water Policy-2002 suggests regulation of ground water resources in such a manner that abstractions do not exceed the recharging possibilities. Ground water recharge projects should be developed and implemented for improving the quality as well as availability of ground water resources.

10.7 Thus, rainwater harvesting has received the focus of government as a dependable water source. Tapping of this renewable resource in an organized manner is the key to address the growing water problems in the country.

11.0 Ongoing Government Programmes in Water and Sanitation Sector

11.1 Water and sanitation was the main focus of the SGF sub-programme. Therefore, a brief review of the ongoing Government Programmes in this sector is necessary.

11.2 Under the Allocation of Business Rules of Government, the Ministry of Rural Development is charged with the responsibility of rural water supply and sanitation. There are two major programmes; namely, the Accelerated Rural Water Supply Programme (ARWSP) and the Total Sanitation Campaign (TSC) presently under implementation in this sector. The salient features of these programmes are at *Annexure X (Page 78)*.

11.3 Under the ARWSP, the main focus is on new construction of hand pumps. The sustainability of water source and O&M of pumps have come out to be the major bottlenecks of this programme. Due to rapid depletion in the ground water level and increased incidences of quality problems of arsenic, fluorides and brackishness, a large number of hand pumps go defunct every year. As a result, despite a much-increased outlay during the IX and the ongoing X Five-Year Plans and coverage of nearly 1 lakh habitations every year, the number of problem habitations has not declined proportionately. The Central outlay for 2004-05 for ARWSP is Rs.2900 crore and with an equal provision in the States' budget, nearly Rs.6000 crore are spent on this programme every year. Poor O&M arrangements for hand pumps further compound the problem. A discussion with the State Government officials dealing with ARWSP indicated of frequent breakdowns of hand pumps due to poor material quality. Repairs are monitored centrally at the Panchayat/Block level and take longer time ranging between 3-4 weeks. Dependence on contractors for O&M makes matter worse.

11.4 Although, the Central Rural Sanitation Programme has been in place since 1986, it could not make much headway until 1996-97, when on the basis of the findings of a baseline survey, it was converted into the present format of TSC. Unlike in the past, the revised programme emphasizes more on a demand driven approach with focus on information, education and communication. The programme supports only the BPL beneficiaries and that too for plinth level construction. Construction of the superstructure is the responsibility of the BPL beneficiary. People above poverty line are expected to put up the toilets with their own funds. Somehow, this concept is not able to motivate the

marginalised population, which is quite significant in number. The rates allowed under the programme are also not very attractive. For example, the cost of a single pit unit is taken between Rs.400 and Rs.625 of which 60% comes from the MoRD, 20% from State Government and the remaining 20% from the beneficiary. Considering an equal expenditure on a proper and usable superstructure to be constructed by the beneficiary, his total share in a single pit unit would work out to 60% and that of the MoRD and State Government as 30% and 10% respectively. In a double pit unit for which the plinth level construction cost is taken as Rs.1000, the shares of beneficiary, MoRD and State Government work out to 70%, 15% and 15% respectively. Bearing the burden of 60% to 70% share in the cost appears to be quite challenging for BPL families.

11.5 Notwithstanding comprehensive and elaborate machinery at the state and the district levels, several other gaps have been observed in the implementation of these programmes. Lack of dedicated agencies at the cutting edge and multiplicity of levels in execution with diffused accountability adversely impacts on the community participation, which is cardinal to the success of such programmes. Activities like education and awareness and capacity building are not effective due to the gap between the implementing agencies and beneficiaries. This leads to the unsustainability of the programme. Projects, which are larger in size, often suffer time and cost overruns resulting from multiplicity of agencies and tendering procedures. Quality control regime is generally not very effective because of heavy dependence on contractors. These shortcomings lead to frequent breakdowns of pumps on account of substandard material quality.

11.6 As a result of these gaps, drinking water availability in a majority of the villages already covered under ARWSP is still not satisfactory, particularly during summer months. The sanitation scenario is also not very encouraging. On the other hand, as per 2001 census, 78% of the rural population still does not have access to sanitary toilets. In this scenario, the community led small projects of the type taken up under this Sub-programme in the rural areas are more popular and have higher public acceptability.

12.0 Findings

12.1 The SGF Sub-programme is the first initiative of its kind taken up as part of the Environment Programme under CCF-I (1997-2001) of UNDP. The main focus of the programme was on taking up small but innovative projects with community participation that would ultimately lead to capacity building of the economically poor and marginalised rural population, particularly women and people living BPL, to plan and manage issues related to water and sanitation. Small projects which have replication potential and which can lead to larger investments were to be supported. The projects were to be implemented through NGOs/CBOs having effective contacts with the community at the grass-root level that is essential for the sustainability of a programme of this kind.

12.2 Selection of innovative projects and competent NGOs/CBOs was the most important step towards achieving the objectives of the Sub-programme. The Steering Committee of MoEF and the Implementing Agency (NHI) played a crucial role in this regard. The draft proposals, over 60 in number, received from different NGOs were screened at several levels according to the guidelines and criteria envisaged under the programme. Out of these, only 20 projects, which fitted in the programme framework,

were finally selected for implementation. Of these, 18 projects relate to rainwater harvesting, water supply and sanitation and soil conservation and the remaining two projects cover studies on water- related issues.

12.3 The role of NHI in the project implementation has been reviewed. Initially, the WSP-SA was assigned the role of the project-implementing agency. It continued up to 31.12.2000. During their period, 9 out of the 20 projects were sanctioned. From June 2001 onwards, WAPCOS were appointed the NHI. The remaining 11 projects were sanctioned during their period and as such, they monitored these projects only. Besides a full time senior technical person as the nodal officer, two engineers and a data entry operator were deputed by the NHI to monitor the programme. However, no baseline surveys were carried out, in the absence of which the evaluation of the programme became difficult. This was a shortcoming of the monitoring process. The NHI undertook 20 field visits for monitoring the physical and financial progress of the projects. Some of the visits were undertaken during the period of scrutiny of the proposals to verify the antecedents of the NGOs and the extent of community's involvement in the projects. Several technical inputs were provided by the NHI to improve the sustainability of the programme. The NGOs and the beneficiaries were generally appreciative of the guidance provided by the NHI during the project implementation. However, some difficulties were faced by the Consultant in retrieving information from the NHI during the review of the Sub-programme. Thus, their record keeping and communication system need to be improved. Use of e-monitoring would also be desirable.

12.4 Water augmentation through rain water harvesting in Salaita and Sinsini, tapping of natural springs to meet water supply in two villages of Uttar Kashi, augmenting water supply for irrigation in cold deserts like Lahul-Spiti, demonstration trials of Terra-cottem, a soil conditioner in Rajgarh, are some of the innovations that have been supported under the SGF programme. All these projects have replication potential and can trigger larger investments in rural areas. For example, in the Bharatpur district of the water scarce State of Rajasthan alone there are more than 300 ponds that can be recharged through rainwater harvesting to address the perennial problem of water supply in the villages. Check dams like the ones in Salaita, Rajgarh and Kothun can trigger revolution and change the economic scenario in the water scarce areas. Artificial glaciers can help in making secluded areas under cold deserts in upper Himalayas self sufficient to manage the water stress situations.

12.5 All the NGOs involved in the implementation of the programme have a strong base and an effective interface with the community in their respective areas. Their operations at the cutting edge and knowledge of the day-to-day problems faced by the community relating to water and sanitation helped in selecting the right project at the right place and making the programme totally demand driven. This alone facilitated in securing the total participation of the community in the programme. The NGOs played their part well by involving the beneficiaries in the decision making process and bringing transparency in respect of programme objectives, methodology of execution and management of finances. Realization of the fact that the initiative was an opportunity to mitigate their longstanding problems inculcated the sense of ownership amongst the beneficiaries, which is the key to the success of such programmes. A classic example was seen at Sinsini in district Bharatpur where the beneficiaries were collectively engaged in deepening the recharged pond using their own tractors for increasing the water storage capacity. Involvement of women and BPL groups in the programme was

given priority. Several activities were taken up at the initiative of women groups alone. In places like Rajgarh, Angamali, Poh and Jamkini, the water and sanitation projects have benefited the tribal women and people from BPL groups.

12.6 Community participation in the programme helped in capacity building of the beneficiaries in managing water and sanitation related issues. In several cases, the community provided valuable inputs to the NGO concerned to improve the sustainability of the project. At Sinsini, the villagers guided the NGO about the correct direction of flow of runoff that helped in maximizing harvesting of rainwater. In Rajgarh, Salaita and Kothun, the sites of check dams were identified by the villagers only, who had full knowledge of the quantities and directions of runoff. Construction activities were taken up with the help of masons and helpers drawn from the community and trained for the work. This provided employment opportunities to them to take up similar works in other areas. In places like Jamkini, Sinsini, Salaita and Poh, most of the earthwork was carried out by the beneficiaries through Shramdan. Innovative ideas like the Ramp-cum-Weir in a cart carriageway by the beneficiaries at Kothun only demonstrates the extent of their knowledge and capacity to handle water-related issues. O&M of nearly 200 hand pumps constructed in Kumaon, Uttaranchal is in the hands of women SHGs that is an indication of their capacity to manage such issues. O&M committees and SHGs at all the places were seen doing good work in terms of managing the assets and generating funds for O&M purposes. Interaction with the beneficiaries during the field visits indicated that if funds were not a constraint, they were confident enough to manage the water and sanitation problems on their own.

12.7 Education and awareness activities were given high priority in all the projects. Several projects were launched with the awareness campaign as the first activity to educate the people how the activity would serve their interest. In a number of cases, the NGOs were able to change the perception, attitude and mindset of the beneficiaries about the utility of activities like ferro-cement tanks, toilets etc. Awareness camps and exposure tours were arranged by most of the NGOs to educate the beneficiaries about the latest developments taking place in the water and sanitation sector. An excellent work has been done in Salaita in this regard. Some of the women beneficiaries of the village were thrilled when they got the opportunity to move out of the village boundaries for the first time in their life. The NGO also arranged training of nearly 20 women of the village on health related issues which would open new job opportunities for them. Workshops of the stakeholders were organized in a number of projects, which served as a good forum to take stock of what had been achieved and how the project could be made sustainable. These workshops also served as a platform for sharing of experience amongst the stakeholders. For example, several innovative and commercially viable ideas emerged from the workshop organized by RUCHI at Rajgarh. The provision for workshops, though desirable, was, however, not there in all the projects.

12.8 Despite the Accelerated Rural Water Supply Programme (ARWSP) of the MoRD, being in place since 1986 in its 'Mission Mode', the availability of potable water in rural areas, especially during summer months, is still not satisfactory. The main focus of ARWSP is on construction of hand pumps fitted on tube-wells or bore-wells as a source of safe water supply. However, due to rapid depletion in the ground water level compounded with the problem of O&M of hand pumps, the number of problem villages with respect to water supply has not declined proportionately. In most of the villages, women still have to walk long distances ranging from ½ km. to 2 kms. everyday to fetch

water for their family. Although baseline surveys have not been done under the SGF Sub-programme, the facts emerging from the field visits clearly indicated that easy availability of potable water in villages was still a distant dream. In the three Panchayat areas of Kerala, it was observed that 30% of the population still did not have access to safe drinking water. The water sources provided under the ARWSP there were too inadequate to fulfil the requirements of the people. Similarly, in the hilly areas of Himachal Pradesh, despite higher rainfall, the community was facing shortage of water during summer months. In the states like Rajasthan, people depend totally on well water for both drinking and irrigation purposes. With the unsatisfactory progress of ARWSP and acute shortage of water for irrigation, people look for alternative sources of water like rainwater harvesting. In Salaita, an old woman had apparently no desire to live, as the village had no drinking water during summer months. In this scenario, the projects based on innovative ideas like rainwater harvesting through check dams and rooftop collection, tapping of natural springs in the hills and creation of artificial glaciers in cold deserts, as attempted under this programme, were found popular amongst the rural community. Large attendance of beneficiaries, particularly that of the women groups, in the interaction meetings at Angamali, Salaita and Sinsini and their willingness to contribute up to 50% in the capital cost further strengthened this view. Wherever provided, these initiatives have been able to minimize the drudgery of women to a large extent. The saved time is now being utilized by them for other income generating activities like backyard poultry, vegetable cultivation and tailoring.

12.9 Nearly 70% of the agriculture in India is rain-fed and depends upon the vagaries of monsoon. Non-uniform distribution of rains in terms of time and space makes matter worse. Fast depletion in ground water level and consequent reduced recharge compounded with deforestation activities have resulted in rendering a large area of cultivable land into wasteland. In States like Rajasthan and parts of Uttar Pradesh, farmers face acute shortage of water for irrigation during summer months. In Salaita and Kothun, fresh formation of ravines on the cultivable land is on the increase due to lack of management of runoff. In hilly areas, slopes do not permit retention of water due to quick flow down of runoff. Therefore, watershed management projects like construction of check dams, gully plugging, spillways etc. taken up under the SGF programme were found popular amongst the community. According to the final completion report, the water table in 52 wells in Kothun rose by about 1' to 2' as a result of check dam, which provided water for irrigation of additional 30-40% land. The fact that farmers in Salaita do not spend money any more on watering the fields after the construction of check dam and nearly 30% to 50% increase in the agricultural income of farmers in Kothun and Rajgarh as a result of check dams and farm ponds explains the rationale behind the popularity of such works. During the field visits, the beneficiaries strongly argued for replication of these works.

12.10 Despite a major programme of 'Total Sanitation Campaign' (TSC) of MoRD being under implementation since 1986, about 78% of the rural population still does not have access to sanitary toilets. Therefore, low cost toilets based on the concept of soak pits are in considerable demand in rural areas. Of the 7 project areas where field visits were made, 40 toilets in Salaita and 50 toilets in Angamali have been provided. In addition, provision of toilets was also there in Uttar Kashi and Manipur. In Angamali all the toilets have been provided for people from BPL groups. Due to a higher level of literacy and awareness in Kerala and Manipur, the utilization of the toilets was found to be quite satisfactory there. However, in Salaita, some of the beneficiaries were still going

for defecation in the open areas. The Head of the Mahila Samity there was requested to take up awareness work for educating the people about the benefits and use of sanitary toilets.

12.11 Another innovation tried under the SGF programme at Rajgarh is in respect of demonstration trials of a multipurpose soil conditioner, Terra-Cottem as a long-term soil-moisture-retaining agent. Although, the demonstration was successful, it was not found economically viable in the hilly areas of Himachal Pradesh, which supports marginal farmers only. The purchase price of the polymer at Rs.500/kg was reported as the main reason for its low acceptability. Marginal farmers rather prefer core facilities like check dams and farm ponds, which have practically no recurring cost.

12.12 Under the rainwater harvesting projects at Sinsini and Rajgarh, although water availability has been significantly augmented, non-availability of a small pipe network became a constraint due to which the benefits could not reach the entire population of the project area.

12.13 An investment of over Rs.2 crore has gone into this Sub-programme which ought to have been converted into some tangible benefits to the community. In the absence of a proper baseline survey, quantification of benefits and coverage of beneficiaries was difficult. Notwithstanding this limitation, an attempt has been made to list out the benefits in the following table on the basis of interaction with the community and discussions with the NHI.

Sl. No.	Activities	Quantity	Beneficiaries Covered	Remarks/Baseline Data
1	Salaita- Population-1550			
	Check Dam	1 No.	Entire farming population. Soil-moisture increased significantly.	80 million litres storage capacity. Estimated rise in water table-10 feet. Each farmer was earlier spending at least Rs.1000/year for watering the field, which is not necessary now.
	Recharging of wells	5 Nos.	Entire population of the village	Wells used to go dry for at least two months in summer but are now operative throughout the year
	Toilets	40 Nos.	40 households (200 persons)	Two units provided in BPL cluster. Utilization satisfactory and most of the beneficiaries do not go for open defecation any more. Further awareness needed to motivate users to improve

			utilization.
	F.C. Tanks	6 Nos.	2 Schools with 300 students and 4 households (20 persons)
	Education and awareness		Facility provided on demonstration basis. Two tanks provided in BPL clusters
			About 40 persons including women and girls attended 3 exposure tours, a one-year distance education course and a one-week health workers' course. This would open job opportunities for them.
2	Sinsini- Population-14800		
	Revival of a 400-year old pond and recharging of 6 sweet water wells	About 50% of the village population- 7000 persons	Wells used to go dry for at least two months in summer and women had to walk at least 1.5 km. to fetch water. The project has removed the drudgery of 50% population. However, the remaining 50% population still spends Rs.10/household to buy water
3	Rajgarh Population-1600		
	Check Dam	1 No.	About 150 (50%) farmer families. Other 50% could not be covered due to slopes being unfavourable
			0.5 million litres storage capacity. 25 ha. of additional land cultivated besides recharging of ground water. As reported by farmers, their annual income increased from Rs.30000 to Rs.50000.
	Farm Ponds	2 Nos.	About 25 (12%) farmer families
			To cultivate additional 10 ha. of land on account of which income of each farmer increased from Rs. 30000 to Rs.50000 per year.

4	FC Tanks	10 Nos.	31 households (10%)	Of these, 8 families belong to BPL group. Prior to the project, women had to walk at least 500 m on steep slopes to fetch water.
	Terra-Cottem		125 farmers (38%)	Demonstration successful but due to higher price, it was not found economically viable
	Plantation			15000 canopy and 20000 grass root plants to meet fuel and fodder needs
	Education and awareness			One workshop attended by over 80 farmers including women. Two training camps and two exposure tours
Kothun Population-2430				
5	Anicut	1 No.	About 60 farmers	Covered about 30% of the 124 ha. Well-irrigated land. Water table in 52 wells rose from 1' to 2' according to the baseline and post implementation data given in the completion report. Additional water helped farmers irrigating 35% extra land over pre-project period
	Drop Spillways	17 Nos.	17 farmers	Helped in retaining water upstream and controlling soil erosion
	3 Panchayats in Angamali Block Population-64000			
	FC Tanks	60	5500 persons	7 tanks put up in schools and 53 in individual households. Benefits to 30% of population not having proper access to drinking water
	Toilets	50	2500 persons. BPL groups form 80% of beneficiaries	Benefits to 45% of population not having access to safe toilets

	Education and awareness		7 awareness camps	About 875 persons participated
6	Kumaon	203 hand pumps	About 50000 persons @ 250 persons/pump	200 pumps in Kumaon and 3 pumps in Himachal Pradesh
7	Poh (Lahul-Spity)	Artificial glacier	400 tribal beneficiaries	An innovative technology demonstrated to tribes in the remote mountainous region
8	Bagi-Badalda (Uttar Kashi)-Population-440			
	Drinking water	Tapping of 2 Springs	Entire population	Women were walking 4-5 hrs. daily to fetch water. Their drudgery removed
	Toilets	40	All the 40 families of one village	50% cost shared by beneficiaries
9	Jamkin (Orissa)	Watershed works	All 125 tribal families of the village	All families belong to SC/BPL groups. Entire work done as Shramdan by beneficiaries
10	3 villages in Manipur			
	Water Supply		All 1500 families of 3 villages	Safe drinking water through slow sand roughing filters
	Toilets	137 individual and 2 community	137 families and 1000 persons through community toilets	Community toilets put up in Bazar area. Utilization reported satisfactory

12.14 As would be observed from the above table, the facilities like check dam, FC tanks, farm ponds etc. have rendered significant benefits to the community in terms of increase in their agricultural income and removal of drudgery of women. Facilities like check dams/anicut have also helped in groundwater recharge. Although provided at a few places only, toilet facilities have been found popular amongst the beneficiaries particularly the women groups. However, utilization of toilets needs to be improved further through awareness and motivation. On the whole, it was heartening to note that

wherever water augmentation and sanitation facilities had been provided, the beneficiaries appeared quite happy and satisfied.

12.15 The SGF Sub-programme was to serve as a demonstration model for showcasing community led small innovations aiming at capacity enhancement of poor and marginalised rural population to manage water and sanitation problems. Therefore, the focus of the programme was on technology demonstration and not on covering more areas under it. In this background, the budget (SGF contribution only) for each project had been capped at Rs.14 lakhs. Barring the Salaita project where the cost has marginally increased due to sanctioning of a revised cost estimate, all other projects have been completed within the stipulated budget. Community contribution either in the form of cash or kind or Shramdan is essential for the sustainability of such projects as also for inculcating the sense of project ownership amongst the beneficiaries. This condition was not envisaged at the time of launching the programme and was introduced at a later stage only. As a result, community contribution in the projects was not uniform. In the 7 projects where field visits were taken up, it varied from 8% to 24%. In some cases, contributions have been made by the NGOs also.

12.16 Provision of ferro-cement tanks and twin pit toilets was common to several projects approved under the Sub-programme. While the capacity of a ferro-cement tank would differ from place to place and on the user requirements, the designs of both these facilities also widely differed from place to place. As the name suggests, the toilets are supposed to be low cost with focus on water conservation. It was observed that the standard WC pans used in the urban households with piped water supply have been used. Such pans require about 20 litres of water to flush the excreta. Use of such pans in water scarce areas goes against the concept of water conservation. The design of superstructure also differed from place to place. All these variations had a bearing on the unit cost. For example, while the unit cost of a toilet in the Salaita project was Rs.3900, the same in the Angamali project was nearly Rs.5000. Therefore, it is necessary to standardize the design keeping in view the cost as well as need to conserve water.

12.17 The Sub-programme duration was envisaged as three years. However, it has taken nearly five years to complete it. There was a delay of about 6 months due to the change of implementing agency from the WSP-SA to the WAPCOS. In addition, some projects were also delayed due to delay in submission of documents by the NGOs, which in turn delayed the release of funds by the NHI. Thirdly, new projects continued to be sanctioned even in late 2003 and were to be given time for their completion. A period of 12 months was allowed to complete each project. Barring a few, all the projects have been completed within this timeframe. Some NGOs have implemented the projects expeditiously and need to be commended. For example, Andhodaya in Angamali completed the construction of 60 ferro-cement tanks, each of 10,000 litres capacity, in just 10 months and 50 toilets in just 70 days. RUCHI of Himachal Pradesh was of the view that watershed management projects should not be rushed in 12 months as more time is needed to educate and motivate the people to participate in the programme. This suggestion merits consideration for future programmes.

12.18 Some of the projects like those of Salaita, Rajgarh, Poh and Angamali have been implemented in a professional manner by involving community and other reputed NGOs and by introducing innovative measures for educating the beneficiaries. This has not only led to widening the horizon and understanding of the beneficiaries but also in optimizing

the project cost. For example, the cost of earthwork in the Salaita project could be reduced by 50% and that in the Sinsini project by 30%. More importantly, the savings were credited to the project account, which generally does not happen in the government implemented projects. Interaction with the beneficiaries during field visits indicated that the NGOs observed total transparency in respect of project objectives, methodology of execution, finances etc. which provided them credibility and helped in mustering the total support of the community.

12.19 The projects covering two Studies, one on Makhana cultivation in Darbhanga in Bihar and the other on the abatement of river pollution in Himachal Pradesh did not have close-ended objectives. Although a very good work has been done by both the organizations, due to a number of limitations, it has not been possible to achieve the goals for which these Studies were approved. Since a sizeable expenditure has been incurred on these studies, MoEF may consider forwarding the recommendations to the concerned State Governments for further necessary action.

12.20 A clear observation emerging from the field visits and interaction with the beneficiaries there is that they have a strong preference for CBOs and NGOs. over the government agencies for implementation of such initiatives. The reasons advanced by the community for this perception is that the delivery system is far quicker and transparent in the case of NGOs. As the beneficiaries of this Sub-programme were intensively involved in the project implementation and financial matters, they derived satisfaction over the fact that at least 85-90% of the funds have been spent on the hardware/assets. The beneficiaries are well aware of the general public perception that besides time overrun, the administrative costs are much higher in the government-implemented programmes like ARWSP and TSC.

12.21 An attempt has been made to analyze and compare the implementation mechanism of ARWSP with that of the one followed under this Sub-programme. The analysis covers 14 important attributes like accountability, community participation, time schedules, capacity building, transparency, post implementation O&M, approach, water quality etc. and has been presented at **Annexure XI (Page 82)**. As would be observed from the **Annexure**, although a fairly comprehensive implementation and monitoring mechanism is in place under the ARWSP, it is not generally effective. Some of the important factors responsible for this bottleneck are multiplicity of agencies and higher administrative cost as a result thereof, delays in project preparation, larger size projects with much bigger timeframe, lack of dedication as the grass root motivating agents at the cutting edge and dependence on contractors. As such, projects suffer both time and cost overruns. The SGF programme adopted an integrated water resource management approach, as against the decentralized hand pump oriented approach followed under ARWSP. While, SGF programme supplemented the groundwater recharge, the ARWSP operates on withdrawal of groundwater. Due to deeper explorations, the ARWSP is faced with the deteriorating water quality as against the good quality water available through rainwater harvesting. The analysis only strengthens the common perception that properly selected small projects can be better and more effectively managed than the large ones. This also explains why people have preference for NGOs as implementing agents.

12.22 On the whole, it is a well-conceived and well-implemented programme with a strong visibility and reaching out impact. If the response of the community is any

indication, the programme fares much better as compared to the high profile ARWSP or TSC of MoRD or the National River Conservation Plan (NRCP) of MoEF in terms of quality of implementation, accrual of benefits, community participation, education and awareness and capacity building. The Sub-programme is a true reflection of the phrase ‘Small is Beautiful’.

13.0 Lessons Learnt

In view of the foregoing, the important lessons learnt from the Sub-programme may be summarized as under:

- (i) Due to the inherent problems of depleting groundwater levels, O&M of hand pumps and deteriorating water quality under the major programmes of ARWSP and TSC of MoRD, there is an overwhelming demand of water and sanitation projects in the rural areas. Small initiatives implemented with the community participation through NGOs/CBOs are more successful and sustainable than large Government programmes.
- (ii) Selection of good projects and the NGOs is the key factor for the sustainability of a programme of this kind. NGOs, through their grass root contacts act as the opinion builders and motivating force for successful implementation of such activities. Demand driven projects with community led initiatives always show better results
- (iii) Education and awareness activities are vital for soliciting the participation of the community in the programme, which is the key to the success of a project. These activities play a crucial role in influencing the perception, attitude and mindset of the community.
- (iv) Beneficiaries’ contribution in cost either in cash or kind or as Shramdan is essential for ensuring their participation in the programme and its sustainability. It imparts the sense of ownership amongst the community.
- (v) Transparency in respect of programme objectives, methodology of execution and management of finances improves the credibility of the NGO and helps in mustering support, cooperation and assistance of the community in the project endeavour.
- (vi) Workshops of stakeholders are important fora to share the experience amongst the experts and the community and to apply mid-course corrections in the project, if found necessary. Workshops also help in improving the delivery system provided these are arranged in proper perspective.
- (vii) With a more stringent planning and monitoring, it is possible to complete such programmes in 3 years. All projects may be sanctioned during the first year of the programme leaving the remaining two years for their implementation.
- (viii) The rural community is willing to come forward, participate and contribute to any project once they are convinced that the initiative is meant for their welfare and mitigating their hardships.

14.0 Recommendations and Conclusions

14.1 Despite some shortcomings like the absence of baseline surveys and open-ended projects of two Studies, the overall performance of the SGF Sub-programme is seen as quite impressive. In this background, it would be quite appropriate to consider its replication in a bigger format. While the ARWSP and TSC, which are big sectoral programmes, would continue to address the rural water supply and sanitation issues in their own domain, undertaking of the community led small initiatives with integrated water resource management approach would have their own demonstrative impact. Keeping in view the huge potential of harnessing rainwater, a bigger programme on the recommended lines is likely to trigger major policy interventions and larger investments in this sector in future. The challenge in this sector is so large that even the concerted efforts of all the agencies put together would not be enough to exploit the full potential.

14.2 Water conservation and sanitation is part of the Business allocated to MoEF. The Ministry has been implementing an ambitious National River Conservation Plan (NRCP) since 1985. Augmentation of flows to provide adequate dilution capacity in rivers has been drawing the attention of MoEF since the beginning. It is well known that surface water flows and groundwater are complementary to each other. Thus, an Integrated River Basin Management (IRBM) approach has been on the agenda of MoEF to address this issue. IRBM would cover, *inter-alia*, activities like afforestation in the river basin and groundwater recharge through innovative methods including construction of wetlands in the river flood plains besides other identified pollution abatement measures. This provides the desired link of the programme for replication under NRCP.

14.3 NRCP is allocated an outlay of about Rs.350 crore annually. Out of this amount, provision of a small budget of Rs.10 crore for an integrated water resource management project on the lines of SGF Sub-programme should not be difficult. This outlay would be for three years i.e. Rs.3.33 crore annually and would amount to only 1% of the annual budget of NRCP.

14.4 The role of UNDP and other donors of the SGF is to promote development in the country. Going by the response this Sub-programme has generated and the need to maximize harnessing rainwater, they may also consider co-financing the project. If an additional amount of Rs.5 crore is put up by the donors, it would make a reasonable kitty of Rs.15 crore for the programme.

14.5 The programme should cover such activities as rooftop rainwater collection, harnessing of rainwater through check dams, farm ponds, artificial glaciers and other innovative watershed practices, construction of wetlands in the river flood plains and afforestation in the basin. Low cost sanitation is an identified activity under NRCP and a lot is still desired to be done in this sector to achieve the goal of covering the entire country with sanitary toilets. Therefore, this component should be integrated into the programme to make it holistic and more attractive.

14.6 Cost sharing by the community in the capital cost is essential to make the programme sustainable. MoEF operates the River and Lake Conservation programmes on cost sharing in the ratio of 70:30 between GoI and States. Although, ARWSP envisages only 10% beneficiaries' share in the capital cost with O&M cost to be fully

borne by the beneficiaries, it may not be desirable to relax the present funding pattern of NRCP for this programme. As a matter of fact, contribution of 30% in the capital cost by the community, for which their willingness to pay has been established under this Sub-programme, would ensure their total participation in the programme. In order to maintain its separate identity as a totally community led programme, cost sharing by State Governments or Panchayati Raj Institution (PRI) is not recommended. Therefore, for all activities except the sanitation component cost sharing in the ratio of 70:30 between GoI and Community is recommended. In the case of sanitation component, cost sharing in the ratio of 50:50 between the GoI and Community is recommended, as it will be close to that followed under the TSC. Unlike the TSC, provision for a full unit (inclusive of superstructure) of a reasonably good quality should be supported to ensure proper utilization and users' satisfaction and privacy. However, the designs may be standardized and cost optimized. The community's contribution in both water and sanitation components may be in the form of cash, material or labour.

14.7 Project implementation should be through competent NGOs on the lines of SGF programme. PRI at the local level should be made to play the key role in ensuring community participation in the programme. Capacity building and education and awareness should form integral part of the programme. The programme should focus on capacity building of women and BPL groups. Adequate funds need to be earmarked for baseline surveys and education and awareness activities.

14.8 The responsibility of overseeing the implementation may rest with the National River Conservation Directorate, which is responsible for implementation of NRCP. A senior officer of the rank of Director may be designated as the National Programme Director. The same institutional mechanism of the Steering Committee, the Standing Committee and the NHI, as followed in the SGF Sub-programme may be put in place for implementation of the programme.

14.9 The objectives and the selection criteria/procedure for projects and the NGOs may be clearly defined in the programme document. However, a strict monitoring mechanism may be put in place to sanction the projects within the first 12 months of the project duration and to complete the programme in a total period of three years. A wide publicity through newspapers and other Government channels may be considered for selection of competent NGOs and projects from across the country.

14.10 Under the SGF programme, which was a demonstration project, the budget for each project was limited to Rs.14 lakhs only. This amount was not adequate to cover the activities in an entire village or a Panchayat area. Therefore, the ceiling of budget (Government contribution) for each project may be raised to Rs.30 lakhs to cover a village or Panchayat area fully. With an additional 30% share coming from the beneficiaries, the total amount available for a project would become about Rs.40 lakhs, which is considered reasonable for a village/Panchayat area. Priority should be given to the water conservation projects. Out of the total amount, 70% may be earmarked for water and the remaining 30% for sanitation component.

14.11 Plantation of trees is an essential component of any watershed management programme. More stringent guidelines and workable rates need to be prescribed to improve the survival rate. MoEF is implementing a community based Joint Forest

Management (JFM) Programme, which is reported to be quite effective. Similar guidelines may be adopted for implementation of this component.

14.12 The SGF Sub-programme has proved to be a step towards integrated water resource management. A bigger initiative on the lines recommended above would be a leap forward and the beginning of a new chapter in managing our natural resources in a sustainable manner.

Curriculum Vitae of the Consultant

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|---|-------------------------------------|---|
| 1 | Name | R. P. Sharma |
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| 6 | Last post held | OSD to Minister of Environment & Forests |
| 7 | Previous post held | Adviser, in-charge of National River Conservation Directorate of Ministry of Environment & Forests in the pay scale of Rs.18,400 – 22,400 |
| 8 | Qualification | B.E., Post-Graduate Diploma in Project Management, Fellow, Institution of Engineers (India) |
| 9 | Experience & Nature of work handled | <p>(a) March, 1989 to June, 2003 – National River Conservation Directorate of the Ministry of Environment & Forests</p> <p>(i) Formulation and implementation of Government policies and programmes relating to abatement of water pollution.</p> <p>(ii) Worked as a key person in the implementation of Ganga Action Plan (GAP) Phase I, and its extension to GAP Phase II in 1993 and National River Conservation Plan (NRCP) in 1995.</p> <p>(iii) NRCP today covers 31 rivers and works are under implementation in 157 towns in 18 states. The programme size has increased from Rs.4.5 billion (US \$ 100 million) of GAP Phase I to Rs.47 billion (US \$ 1.05 billion) of NRCP.</p> <p>(iv) Worked as key person in the implementation of National</p> |

Lake Conservation Plan (NLCP), which was started in 2000. Conservation plans of 26 lakes at an estimated cost of Rs.1.4 billion (US \$ 31 million) were included under NLCP till June 2003.

(v) Worked as Head of Wetlands Conservation Division since 1997 for 3 years during which period the annual outlay of the programme was increased from Rs.16 million (US \$ 0.35 million) to Rs.60 million (US \$ 1.3 million). Instrumental in increasing the Ramsar sites in India from 6 to 20 during that period.

(vi) Handled as a key person the International cooperation work related to River and Lake cleaning programmes. Successfully negotiated the funding of Yamuna Action Plan (YAP) Phase I and Phase II with JBIC (Japan Bank for International Cooperation) for Yen 17.77 billion and 15.33 billion respectively and financial assistance from the World Bank and under the Indo-Dutch Cooperation Programme equivalent to Rs.1.5 billion (US \$ 33 million) for GAP.

(vii) Successfully negotiated a Development Study of Ganga Basin by JICA (Japan International Cooperation Agency) for preparation of feasibility reports of pollution abatement works of four major towns of U.P. viz. Lucknow, Kanpur, Allahabad and Varanasi. This will finally culminate into a major funding programme by JBIC.

(vii) Handled all Parliament matters relating to river and lake cleaning programmes of MoEF. Work included preparation of draft replies to Parliament Questions and presentation of the work of the Division before the High Powered Parliamentary Committees.

(viii) Instrumental in developing several appropriate and cost effective technologies for treatment of sewage and conservation of lakes.

(ix) Undertook training in The U.K., U.S.A and Japan on formulation, design and implementation of programmes relating to abatement of water pollution.

(x) Represented MoEF in several international conferences. Some of these are Ramsar Convention meeting in Manila and Eco Asia meeting in Tokyo.

(xi) Presented several papers in national seminars and workshops in India on subjects relating to abatement of water pollution.

Some of the important achievements during the tenure as Head of Division are:

- ❖ Development, proving and field application of low cost, energy efficient sewage treatment technologies of Upflow Anaerobic Sludge Blanket (UASB) reactor, Multi Stage Waste Stabilization Ponds and Fluidized Aerobic Bed (FAB) reactor.
- ❖ Development of Design Manual for Waste Stabilization Ponds for India. This is being extensively used all over the country.
- ❖ Development and field application of low cost Bio-remediation technologies for cleaning and conservation of lakes. The first large-scale application of this technique has been done on Powai Lake in Mumbai, which has been fully cleaned. The technology is being applied to several other lakes now.
- ❖ Evaluation of GAP Phase I by Independent R&D institutions and Universities in 1993
- ❖ Cost benefit analysis and evaluation of GAP Phase I by the Harvard Institute of International Development in 1995.
- ❖ Evaluation of YAP by IIT Roorkee.
- ❖ Preparation of detailed project reports of Conservation and Management Plans of Dal Lake (Srinagar) and Nainital Lake and four other lakes in Uttaranchal.
- ❖ Key resource person in organizing six meetings of the National River Conservation Authority, which is chaired by Prime Minister and has membership, among others, of Chief Ministers of the 18 NRCP States.
- ❖ Monitoring of grossly polluting industries along rivers and lakes as part of implementation of NRCP.
- ❖ Development of standards for bacteriological pollution in treated sewage under NRCP projects.
- ❖ Training programmes for the field staff including engineers for operation and maintenance of sewerage system, pumping stations and treatment plants.
- ❖ Training programmes for engineering staff in the States for survey and investigations for preparation of detailed

project reports for new works under NRCP/NLCP.

- ❖ Development of extensive guidelines for preparation of detailed project reports for new works under NRCP/NLCP.

- ❖ Development of interactive web site of YAP.

(b) June, 2003 to January, 2004 – OSD to Minister of Environment & Forests

(i) Assisted the Cabinet Minister in expeditious handling and disposing of matters relating to environment and forests clearances, conservation plans of rivers and lakes, coastal regulation zones, project tiger, project elephant and international conventions and protocols on climate change, protection of Ozone layer and Biodiversity.

(ii) Assisted the Minister in addressing the COP 9 (Conference of Parties) on Climate Change in his capacity as President of COP 8 at Milan, Italy.

(iii) Assisted the Cabinet Minister in setting up the National Biodiversity Authority at Chennai and restructuring of National and Regional Environment Authorities.

(iv) Assisted the Cabinet Minister in monitoring the Charter on CREP (Corporate Responsibility for Environment Protection)

(v) Assisted the Cabinet Minister in regular monitoring the Plan Outlays of the Ministry, which helped in achieving higher targets of expenditure of plan funds.

(c) May, 1978 to March, 1989 – National Research Development Corporation (NRDC) of Ministry of Science & Technology.

(i) NRDC is a premier institution in the field of transfer of indigenous technology. Worked as Regional Manager in-charge of Kolakata office of the Corporation.

(ii) Organized a national workshop on application of appropriate rural technologies for minimizing the drudgeries of rural population, including women.

(iii) Organized a training programme for small entrepreneurs on upscaling of an R&D project to a field level commercial project.

(iv) Had the distinction of transferring the know-how of building bricks from fly ash to a commercial level for the first time in the country at Kolkata.

(d) October, 1966 to May, 1978 – Durgapur Steel Plant of Steel Authority of India

(i) Worked as Manager in the Technical Appreciation and Development wing, where work, *inter alia*, included technical evaluation of various units of the steel plant on a monthly basis.

(ii) On the basis of such evaluation reports, corrective actions were taken by the higher management towards improving the performance.

TERMS OF REFERENCE

EVALUATION OF SUB-PROGRAMME IND/97/946 – SMALL GRANTS FACILITY FOR WATER SECTOR

BACKGROUND:

This sub-programme under the Environment Programme Support of the Country Cooperation Framework-I (CCF-I) is a focused effort to reach out to water-related groups in various parts of the country. The Small Grants Facility (SGF) has been developed as a multi-donor effort in recognition of the considerable interest of many members of the donor community in issues related to water and people. The SGF is ultimately intended to reinforce the Government of India's capacity to devote adequate attention to analyzing on-the-ground experience and to devise strategies for achieving wider impacts. The focus of the SGF is to promote innovative initiatives in the fields of water and sanitation in both urban and rural areas.

The SGF aims at community-level solutions which address chronic or acute water stress in areas where vulnerable human communities face serious problems in water supply or quality, safe disposal of human or industrial wastes and inadequate irrigation facilities or environmental degradation. This was to be achieved by expanding the range of available managerial and technological options consistent with environmentally sound, economically and socially accepted water resources management initiatives at the grass-roots level.

PURPOSE OF THE EVALUATION:

The progress of the SGF sub-programme appears to be quite satisfactory, though there has been a delay in implementing some of the activities. It has, therefore, been decided by UNDP and MoEF to analyze the effectiveness of the assistance provided in achieving the objectives and building capacities at local, sectoral or regional levels. The evaluation is also intended to make detailed recommendations on the lessons learnt for sharing the experience within and outside the country.

ISSUES TO BE ADDRESSED/EXPECTED OUTCOMES:

While evaluating and reporting on the following aspects, the impact should be assessed at two distinct levels (1) NGO-level in the areas of their operation; and (2) thematic (sectoral/regional) level. The impact/outcome of activities of similar projects by different NGOs should be compared and commented upon. While each initiative is a very small one and baselines may not be clearly defined in the proposals, an effort should be made to assess/establish the baseline for the completed activities, wherever possible.

The following areas are essentially required to be covered by the evaluation:

- 1) Physical progress of SGF as a whole and also each project, the geographic coverage of the programme and the spatial extent of each project and the sense of ownership by the community. How each project has evinced interest from the community/stakeholders.
- 2) How far has SGF enhanced the capacity of economically poor and marginalized rural populations, particularly women, urban slum dwellers and indigenous people to plan and manage water and sanitation in a sustainable manner?
- 3) Has SGF brought forward a strategic focus in establishing an efficient, demand-responsive mechanism for supporting community-based initiatives in the water and sanitation sector? How has its impact been on evolving community-level solutions, in addressing problems in water supply or quality, safe disposal of human or industrial wastes, irrigation facilities or environmental degradation.
- 4) Extent of local expertise, innovations, indigenous knowledge and resources used in each project?
- 5) Has the SGF (or each project) learnt/shared any experience and how it has benefited from any other project of UNDP?
- 6) How far has the capacity of NGOs been strengthened to support community-level initiatives through improved community access to managerial, technical and financial support?
- 7) Has any local level forum been established to bring together key stakeholders to promote collective decision-making and problem solving? And how the public/private/NGO partnerships have been promoted in addressing water and sanitation needs of local populations?
- 8) Comments on the educational and awareness campaigns to reinforce the impact of activities supported by the SGF.
- 9) Comments on systematic documentation/information dissemination, networking, publications, learning through workshops, networking under ongoing government programmes.
- 10) Replication impact/up-scaling of projects, broadening the agendas of NGOs, including any policy interventions at the local/State levels.
- 11) Role of the National Host Institute (WAPCOS), methodology and process of NGO selection, monitoring & evaluation, including the role of the National Steering Committee.

LESSONS LEARNT:

Significant lessons that have emerged as a result of the project, in particular what has worked well and can be up-scaled and what has not worked so well and should be avoided in future.

Any corrective actions required, if any, for the design, implementation, monitoring and evaluation of similar projects.

SCHEDULE:

The starting date of the evaluation is scheduled for 7 June 2004. The evaluation will comprise of a total of 45 days. The sites to be covered for the field visit are:

- 1) Darbhanga (Wetlands);
- 2) Etawah (Check-dam – rainwater conservation);
- 3) Solan (Soil moisture/afforestation for fodder, fuel and spices;
- 4) Ernakulam Distt. (Rainwater conservation – a unique replicable model;
- 5) Bharatpur (Social forestry programme/water resources management); and
- 6) Jaipur (Rainwater harvesting).

The schedule of visits to these locations will be agreed in advance. If during the course of the evaluation it is felt that any additional site or reduced number of visits are to be undertaken, the same may be approved from UNDP in advance. At the end of 30 days, the consultant will debrief UNDP, MoEF and the Department of Economic Affairs (DEA) and present his/her draft report. The final report will be submitted within 15 days after incorporating the recommendations on the draft report.

METHODS/APPROACH FOR THE EVALUATION:

The consultant should provide details in respect of:

- Document review;
- Interviews;
- Field visits;
- Questionnaires, if any;
- Participatory techniques and other approaches for gathering and analysis of data; and
- Participation of stakeholders and/or partners.

CONSULTATIONS:

During the period of the evaluation, the consultant will consult all reports, files, manuals, guidelines and resource people related to the project. The consultant will liaise closely with the UNDP Assistant Resident Representative/her staff, the concerned agencies of the Government, WAPCOS and the counterpart staff assigned to the project. The consultant can raise any issue or topic s/he deems necessary to fulfill his/her tasks. The consultant, however, is not authorized to make any commitments to any party on behalf of UNDP/Government.

REPORTING:

While the consultant is free to use any detailed method of reporting the report must include the following:

- 1) Executive Summary;
- 2) Introduction;
- 3) Contents;
- 4) Methodology;
- 5) Observations on the issues addressed;
- 6) Findings and conclusions;
- 7) Recommendations;
- 8) Lessons learnt,
- 9) Annexes/documents attached;
- 10) List of persons met; and
- 11) Copy of the approved TOR.

The consultant will submit four copies of the final evaluation report to UNDP.

List of projects where field visits were undertaken

Sl. No.	Project	Date of Visit
1	Augmentation of Water Resource and Hygiene Facilities in Village Salaita, District Etawah, U.P.	8/9.06.2004
2	Sustainable Development of Tal Maharaja Badan Singh for Drinking Water Supply in Sinsini Village, District Bharatpur, Rajasthan	11/12.06.2004
3	Sustainable Development through Water Conservation in Pairvi Khud Micro Watershed Area; Rajgarh, District Sirmaur, Himachal Pradesh	15.06.2004
4	Sustainable Development of Industrial Estates of Himachal Pradesh through Joint Industrial Planning & Management	16/17.06.2004
5	Participatory Sustainable Land and Water Use Management in Macro-watershed Sanwalia, Chaksu Block, District Jaipur, Rajasthan	28/29.06.2004
6	Sustainable Management of Wetlands in Dharbhanga, North Bihar	02.07.2004
7	Popularization of Rainwater Harvesting through construction of Low Cost Ferro-Cement Tanks for Drinking Water Supply and Environment Preservation and Development of Sanitation Facilities through construction of Low Cost Sanitary Latrines in Ernakulam district, Kerala	05/06.07.2004

Questionnaire listing the Issues to be addressed during evaluation

- ❖ Project Title:
- ❖ Date of Visit:
- ❖ Place of Implementation, Geographical Location, latitudes, longitudes
- ❖ Population of village, Ratio of male and female, SC, ST, Literacy Level, Main profession of the people, main crops raised, total cultivable land, average annual rainfall, means of irrigation at present
- ❖ Name and Address of NGO with e mail ID, if any, Registered Office, a small write-up on the activities undertaken by NGO, Total Experience as NGO, Details of office bearers, Financial status (Balance Sheet, Audited statement of accounts for the past two years, names of personnel put up on the project, Annual Budget, Sources of funding)
- ❖ Details of other activities, if any, undertaken by NGO:
- ❖ How was the project selected? Was it demand driven?
- ❖ Exposure of NGO in similar work
- ❖ Project components
- ❖ Cost Estimates, Basis of estimates, comparison of cost with other similar projects, Design Support
- ❖ Main Thematic Area under which the project falls:
- ❖ Details and impact of similar projects undertaken by different NGOs:
- ❖ Assessment of baseline data *vis-à-vis* completed activity:
- ❖ Physical Progress:
 - Date of approval
 - Date of start of work
 - Scheduled date of completion
 - Actual date of completion
 - Reasons for delay, if any
- ❖ Financial Progress:
 - Sanctioned cost
 - Actual expenditure
 - Contribution by WAPCOS
 - Beneficiary Contribution

Accounts keeping by NGO
Copy of final UC

- ❖ Geographical/spatial coverage of the project as % of the total area, if possible:
- ❖ No of beneficiaries covered:
- ❖ Population of the target group:
- ❖ Response of and sense of ownership by the community/stake holders and a writ up on community participation, Details of SHGs/Committees constituted to monitor the project:
- ❖ Capacity enhancement of economically poor and marginalised rural population, particularly women, slum dwellers and indigenous people to plan and manage water and sanitation in their area:
- ❖ Whether the project has been demand driven, if so how:
- ❖ How has its impact been on evolving community level solution of the environmental problem facing the stakeholders?
- ❖ Extent of local expertise, innovations, indigenous knowledge and resources used:
- ❖ Learning/sharing of experience from the project, if any:
- ❖ Benefit or exchange of information from any other project of UNDP:
- ❖ Capacity enhancement of NGO to support community level initiatives:
- ❖ Any local forum of stakeholders established for collective decision making and problem solving:
- ❖ How public/private/NGO partnership has been promoted in addressing the core issues:
- ❖ Educational and awareness campaigns, if any to reinforce the SGF activities:
- ❖ Whether any documentation/information dissemination, networking, publications, workshops etc taken up by the NGO or CBOs:
- ❖ Whether any networking done under ongoing Government Programmes:
- ❖ Replication or upscaling potential of project and initiative in that direction:
- ❖ Policy intervention at the local or state levels:
- ❖ Role of WAPCOS in methodology and process of NGO selection, monitoring and evaluation.

List of Persons met during Field Visits

1. Salaita, District Etawah, U.P.

- (i) Maj. Gen (Retd.) A.P.S. Chauhan, Vice President Sainik Foundation
- (ii) Shri Mahendra Mansingh, Village Pradhan
- (iii) Shri Mathura Singh, Dekh Rekh Samiti
- (iv) Shri Santosh Chauhan
- (v) Mrs. Kusuma Devi
- (vi) Director, Manav Bharti School, New Delhi, which conducted the distance education programme for village women
- (vii) In addition, about 20 members of the village community both male and female were present in the meeting arranged by the NGO

2. Sinsini, District Bharatpur, Rajasthan

- (i) Shri S.R. Gupta, Executive Director, LHWRF
- (ii) Shri Manoj Prabhakar, Project Coordinator, LHWRF
- (iii) Smt. Uma Chaudhary, Social Worker, LHWRF
- (iv) Smt. Pushpa, Social Worker, LHWRF
- (v) In addition, about 25 members of the village community both male and female were present at the field interaction meeting arranged by the NGO

3. Rajgarh, District Sirmaur, Himachal Pradesh

- (i) Shri Nagendra Chauhan, Project Coordinator, RUCHI
- (ii) Shri Yudhvir Raina, Technical Expert, RUCHI
- (iii) Smt. Vijaya Pundhir, Woman Organiser, RUCHI
- (iv) Shri Suresh Kumar and his family members, Beneficiary, Village Neri
- (v) Shri, Pawan Kumar and his family members, Beneficiary, Village Neri

4. Shimla, Baddi-Barotiwala and Parwanoo

- (i) Member Secretary, HPSTEPPCB, Shimla
- (ii) Dr. Madhu Soni, Principal Investigator,
- (iii) Shri, Avinash Sharda, Project Team Member, Baddi-Barotiwala
- (iv) Shri Brij Bhushan, Project Team Member, Baddi-Barotiwala
- (v) Dr. Harish Sharma, Project Team Member and Lab Official, Parwanoo

5. Kothun, District Jaipur, Rajasthan

- (i) Shri V.K. Bagda, Director, CNRM, IIRM, Jaipur and other officials of the Institute
- (ii) Shri Hanuman Chaudhary, Chairman, Project Implementation Committee
- (iii) In addition, a meeting was arranged by the NGO, which was attended by about 40 members of the community from 9 adjoining villages

6. Darbhanga, Bihar

- (i) Dr. S.S.N. Sinha, Director General, MSEAVS
- (ii) Dr. Vidyanath Jha, MSEAVS
- (iii) Dr. Dharendra Kaushal, MSEAVS
- (iv) Dr. Navin Jha, MSEAVS
- (v) In addition, an interaction meeting was held at the project sites which was attended by about 10 members of the Mallah community

7. Angamali, District Ernakulam, Kerala

- (i) Mr. Peter Thettayil, Executive Director, the Andhyodaya
- (ii) Mr. George, Director, the Andhyodaya
- (iii) Head Master, Sr. Primary School, Illithode
- (iv) Father Sebastian Thalian, Holy Family High School, Thabore
- (v) Teacher, Anganwadi School, Thabore
- (vi) Family Members of 6 FC tanks beneficiaries and 2 toilets beneficiaries
- (vii) In addition, about 60 persons including school children at the meeting at Illithode and 40 persons at the meeting at Thabore participated in the discussions

List of SGF Projects Implemented by WSP-SA as NHI

Sl. No.	Project Title	Agency/NGO	Time Frame	Cost (Rs.) in Lacs
1.	Video Documentation of 'Women's Enterprises in Water and Sanitation	Vanangara, Karvi (U.P)	11/1999 to 3/2000	10.54
2.	Prioritisation of Micro Water sheds for Management in Bijapur District Karnataka.	Centre for Environment Education –South , Bangalore	4/2000 to 3/2001	12.704
3.	Sustainable Drinking Water Intervention in Puri district Orissa	FM Welfare Club Puri, Orissa	4/2000 to 10/2000	4.55
4.	Sanitation Project in Kendrapara, Orissa	Nature's Club Mahipal, Kendrapara, Orissa	4/2000 to 10/2000	4.505
5.	Techno-Economic Appraisal of Deep Infiltration wells/Handpumps in Kumaon Hills	Pan Himalayan 'Grassroots' Development Foundation, Ranikhet	4/2000 to 3/2001	13.0
6.	Loan Support to Low Income Households for Basic Water & Sanitation facilities	Friend's of Women World Banking (FWWB), Ahmedabad	6/2000 to 5/2001	13.0
7.	Loan Support to Low Income Households for Basic Water & Sanitation facilities	Development Support Centre Ahmedabad, Ahmedabad	6/2000 to 5/2001	12.9
8.	Draught Proofing Construction of Community Rain Water Harvesting Structures in Jaipur, Ajmer, & Baran district, Rajasthan	Social Work and Research Centre, Tilonia, Rajasthan	6/2000 to 12/2000	12.8
9.	Sustainable Management of wetlands in North Bihar	Mithila Samajik Evam Arthik Viaks Sansthan, Leharai Sarai, Darbhanga	10/2000 to 9/2001	3.0
	Total			86.999

Note:- 1. Project cited at Sl. No. 1 to 9 sanctioned by WSP-SA and those cited at S.No.1,3,4 & 8 were completed prior to WAPCOS taking over the programme as NHI.

2. Projects at Sl. No. 2,5,6,7 and 9 completed under WAPCOS control

List of SGF Projects Implemented by WAPCOS as NHI

Sl. No.	Project Title	Agency/NGO	Time Frame	Cost (Rs.) in Lacs
1.	Water Supply and Sanitation Project in 3 villages of Thoubal district, Manipur	Wangjing Women and Girls Society (WWAGS) Wangjing Bazar, P.O. Wagjing-795148 Manipur	12/2001 to 6/2002	13.095
2.	Water Management in cold Desert (Lahul Spiti)	PRAGYA, Gurgaon A-212 A Sushant Lok I Gurgaon	1/2002 to 12/2003	12.40
3.	Augmentation of Water Resoruces and Hygience facilities in Salaita Village, Etawah, UP	All India Ex Soldiers League, 6090 B8 Vasant Kunj, New Delhi	1/2002 to 12/2002	13.75
4.	Sustainable Development of Industrial Estates of Himachal Pradesh through joint Industrial Planning and Management	H.P. State Environment Protection and Pollution Control Broad Bhavan, New Shimla (H.P)	2/2002 to 1/2003	13.272
5.	Sustainable Development through Water Conservation in Pairvi Khud Micro Water shed area, Rajgarh	Rural Centre for Human Interest (RUCHI) Technology Complex, Bandh P.O. Bhaguri – 173233 (HP)	9/2002 to 9/2003	10.43
6.	Sustainable Development of Tal (Maharaja Badon Singh) for Drinking Water Supply And Improvement Of Aquatic Environment in Sinsini Village Deeg block Bharatpur (Rajasthan)	Lupin Human Welfare and Research Foundation (LHW&RF) 160 Krishna Nagar, Bharatpur –321001	9/2002 to 9/2003	9.25
7.	Popularisation of Rain Water through Construction of Low Cost Ferro Cement Tanks for Drinking Water Supply	ANDHYODAYA, M.C. Road Angamaly 683572 Ernakulam, Kerala	9/2002 to 9/2003	12.651
8.	Water Supply and Sanitation for Bagi and Badalda Villages, Chinyali Saur Block, Uttarkashi Uttaranchal	Himalayan Ecology and Treatment of Natural Agriculture (HETONA) Ladari Complex, NIM Road, Uttar Kashi	9/2002 to 9/2003	12.788

9.	Participatory Sustainable and Water use Management in Kothun Village, Chaksu Block, Jaipur district, Rajasthan	Indian Institute of Rural Management Tagore Marg, Mansarovar Jaipur-302020	9/2002 to 9/2003	11.894
10.	Sustainable Development of Tribal Women through Management of Watershed (Land and Water Resources) in Jan--- Village, Himgiri Block, district Sundargarh, Orissa	Society for Rural Advancement and Democratic Humanitarian Action (SRADHA) N-5/386 IRC Village, Nayapalli Bhubaneswar –751015	9/2002 to 9/2003	11.962
11.	Conservation of Water for Drinking Water Supply and providing sanitation facilities in Moltha & Pujargaon Villages, Dhima Sunehri Gad, Bhil Ganga Valley, district Tehri Garhwal Uttarakhand	The Himalayan Sewa Samite (HSS) P.O. Devta Dhar	01/2004 to 03/2004	3.445
	Total			124.937

Annexure VIII

Details of Field Visits of NHI

Sl. No.	Project Title	Agency/NGO	Period of visit	Name of officials
1.	Water Supply and Sanitation Project in 3 villages of Thoubal district, Manipur	Wangjing Women and Girls Society (WWAGS) Wangjing Bazar, P.O. Wagjing-795148 Manipur	14.4.02 to 17.4.02	U.P.Srivastava
2.	Water Management in cold Desert (Lahul Spiti)	PRAGYA, Gurgaon A-212 A Sushant Lok I Gurgaon	7.8.02 to 13.8.02	U.P.Srivastava
3.	Augmentation of Water Resoruces and Hygience facilities in Salaita Village, Etawah, UP	All India Ex Soldiers League, 6090 B8 Vasant Kunj, New Delhi	27.4.02 to 12/2002 19.11.02 to 21.11.02	U.P.Srivastava U.P.Srivastava
4.	Sustainable Development of Industrial Estates of Himachal Pradesh through joint Industrial Planning and Management	H.P. State Environment Protection and Pollution Control Broad Bhavan, New Shimla (H.P)	11.7.02 to 15.7.02 22.11.03 to 24.11.03	U.P.Srivastava U.P.Srivastava
5.	Sustainable Development through Water Conservation in Pairvi Khud Micro Water shed area, Rajgarh	Rural Centre for Human Interest (RUCHI) Technology Complex, Bandh P.O. Bhaguri –173233 (HP)	12.6.02 to 15.6.02 24.7.03 to 26.7.02 20.11.03 to 22.11.03	U.P.Srivastava U.P.Srivastava U.P.Srivastava
6.	Sustainable Development of Tal (Maharaja Badon Singh) for Drinking Water Supply And Improvement Of Aquatic Environment in Sinsini Village Deeg block Bharatpur (Rajasthan)	Lupin Human Welfare and Research Foundation (LHW&RF) 160 Krishna Nagar, Bharatpur –321001	20.6.02 to 22.6.02 1.5.03 to 3.5.03 13.10.03 to 15.10.03	U.P.Srivastava U.P.Srivastava U.P.Srivastava
7.	Popularisation of Rain Water through Construction of Low Cost Ferro Cement Tanks for Drinking Water Supply	ANDHYODAYA, M.C. Road Angamaly 683572 Ernakulam, Kerala	2.6.02 to 5.6.02 8.1.03 to 11.1.03	P.C. Mathur U.P.Srivastava

8.	Water Supply and Sanitation for Bagi and Badalda Villages, Chinyali Saur Block, Uttarkashi Uttaranchal	Himalayan Ecology and Treatment of Natural Agriculture (HETONA) Ladari Complex, NIM Road, Uttar Kashi	26.5.02 to 30.5.02	U.P.Srivastava
9.	Participatory Sustainable and Water use Management in Kothun Village, Chaksu Block, Jaipur district, Rajasthan	Indian Institute of Rural Management Tagore Marg, Mansarovar Jaipur-302020	23.12.01 to 25.12.01 28.4.03 to 30.4.03	U.P.Srivastava Adarsh Kalhia U.P.Srivastava
10.	Sustainable Development of Tribal Women through Management of Watershed (Land and Water Resources) in Jan--- Village, Himgiri Block, district Sundargarh, Orissa	Society for Rural Advancement and Democratic Humanitarian Action (SRADHA) N-5/386 IRC Village, Nayapalli Bhubaneswar – 751015	21.5.02 to 25.4.02 8.5.03 to 11.5.03	U.P.Srivastava U.P.Srivastava
11.	Techno-Economic Appraisal of Deep Infiltration Wells/Hand Pumps in Kumaon, Himalayan.	Pan Himalayan Grass Roots Development Foundation, Ranikhet	3.9.02 to 7.9.02	U.P.Srivastava

Technical inputs provided by the NHI during field visits

Sl. No.	Implementing Agency	Technical Inputs
1	IIRM Jaipur	(i) Develop Silvipasture around Kothun (Sanwalia) and afforestation programme (ii) Laying of fast growing grass to check soil cross in Get a few ground water samples chemically analysed
2	All India Ex Soldier's League (Sainik Foundation)	(i) Protection of shoulders need special attention as on either end of the dam these are found to be fragile & weak which need burnt brick pitching (ii) Provide additional gully plugs down the gully slope (iii) To provide spillway with down the slope steps in such a way that the terminal step merges with yamuna slope (iv) Arrange educational tour for community to CG&FRI, Jhansi
3	RUCHI, Rajgarh	(i) Bench terracing to be replaced with staggered trenches which is better suited considering steep slopes of the terrain (ii) Basli (stepping spring source) to be cleaned and inlet fissures to be cleared to rejuvenate the water source for limited water supply for domestic purpose (iii) The Capacity of the FC Tank (2.5 kl) should be doubled to have reasonably good storage (iv) Additional gully plugs to be provided upslope from ser to Jagas village for flow of water for longer period of time
4	Lupin Human Welfare and Research Foundation, Bharatpur	(i) Inlet channels and the catchment for the Maharaja Badan Singh Tal to be further treated and developed (ii) The Pond bed needs to be deepened through removing 1 m thick silt layer (iii) Embankment to be provided with stone pitching and the limited pitching done needs to be redone for ensuing durability & strength to the slopes (iv) Provide one drinking water rectangular tank (6x3x1 m) for village cattles near the ancient dug well. After the ancient well is rejuvenated through cleaning/removal of muck and repairs, water will be available for filling the tank (v) Social forestry needs to be strengthened through local community's initiative as follows: <ul style="list-style-type: none"> ❖ Engage one chowkidar cum – water man to look after the sapling around the pond ❖ Provide organic manure around sapling after the removal of about 15-20 cms of hard Kankary material ❖ Replace dried up sapling with new healthy ones

		<p>❖ Mobilise women SHGs and school children for upkeep, maintenance & supplementation of social forestry work</p> <p>(vi) Through the initiative of local community and Panchayat development of self-sustaining mechanism for maintenance of Tal and preservations & protection of assets created under the project.</p>
5	SRADHA, Sundargarh	<p>(i) Provide Gabion structure at the inlet channel on the Western part of the newly constructed pond</p> <p>(ii) Slope / Embankment of the pond to be provided with vegetative cover (grass & shrubs) for ensuring stability</p> <p>(iii) Two constructed open dug wells to be provided with replaceable cover and with the consent of the village community install one handpump on either of the two dug wells on the Western part of the newly constructed pond</p> <p>(iv) Ephemeral Birja Munda Klala should be provided with 3-4 gully plugs and one gabion structure at the exit point</p> <p>(v) Create village fund (gram Kash) for Post Project O&M</p>
6	HPSEPPCB, Himachal Pradesh	<p>(i) Collect representative ground water samples from each of the micro basin and determine chemical characteristics (26 parameters)</p> <p>(ii) Impart training course to Scientist / Engineers in ORACLE for storage/ retrieval and management of large data spectrum</p> <p>(iii) Collect Raw Water samples being used in different Industries for Comparative study with the effluents</p> <p>(iv) Chemical Lab should Install ToC. With GC in place, it is desirable to procure TOC</p> <p>(v) It is desirable to analyze select effluent samples for Cn, Se, Cu, Mn, As, Hg, Cr (hexavalent), Cd, F&B considering the existence of Electroplating, Leather & Textile Dyeing Industries in the area</p> <p>(vi) Chemical Laboratory should procure selective Ion meter</p>
7	ANDHYODAYA, Angamali	<p>(i) Integration of sanitation and environmental issues with water harvesting and water supply works</p> <p>(ii) Harvesting of surface run off through construction of check dam in future through funding from other sources</p>
8.	Wangjing Women and Girl's Society , Thoubal	<p>(i) Suggested modification in the community toilets in Bazar area from two compartment to three out of which one to be reserved for exclusive use of women & girls</p> <p>(ii) Maintenance of the created assets to be managed by the community funds through engaging poor member on monthly payment basis</p>
9.	PRAGYA, Poh	<p>(i) Lifting of Poomarang Nala waters across spity river up to the Poh village fields ruled out and PMU was advised to drop this option</p> <p>(ii) Similarly deployment of Hydrams was ruled out in view of operational difficulties (due to shifting water levels & heavy silt load).</p>

		(10) PMU was encouraged to locate a glacier artificially created in a sunshade area but avoid location of site in higher reaches to avoid land slide hazard
10.	HETONA, Uttar Kashi	<p>(i) Mass awareness & motivation of mountain community needs to be strengthened for effective management of water resources and drainage and sanitation hazards.</p> <p>(ii) PMU was advised to form women SHGs, Pani Samiti, monitoring committee and create a village fund (GramKash) for up keep and maintenance of assets created under the project</p> <p>(iii) Regular Monitoring of discharge of Khuneta and Chaubara spring especially during the load period, the record should be well documented</p> <p>(iv) Central water reservoir to be provided with chlorinator</p>

Review of ARWSP and TSC of MoRD

1.0 ARWSP

1.1 The water supply and sanitation programmes for the rural sector have been under implementation, though under different names and pattern of funding, right from the commencement of the first Five Year Plan in 1954. Since then these have traveled a long journey of ups and downs, continuation and discontinuation, success and failures.

1.2 With a view to accelerating the pace of the water supply in the villages, a modified programme; namely, the Accelerated Rural Water Supply Programme (ARWSP) was introduced in 1972-73 with 100% grant-in-aid. With the introduction of the Minimum Needs Programme, ARWSP was withdrawn during the fifth Five Year Plan in 1974-75 and again reintroduced in 1977-78. The entire programme was given a Mission approach with the introduction of the National Drinking Water mission in 1986, renamed later as the Rajiv Gandhi Drinking water Mission in 1991 which is presently under implementation.

1.3 Despite the increased outlay during the ninth Five Year Plan and change in technology focus to hand pumps, the availability of potable water supply to rural areas, particularly during the summer months, did not improve to the satisfactory levels. Although, 1 lakh habitations were being covered every year, the number of problem habitations did not decline proportionately. The reasons for this scenario were:

- (a) Fast depletion of ground water level, which increased the incidences of quality problems of Arsenic, fluoride;
- (b) Water sources going dry and defunct with consequent reduced ground water recharge;
- (c) Heavy emphasis on new construction and poor attention to maintenance; and
- (d) Lack of people's participation and neglect of traditional water management practices and systems.

1.4 Accordingly, the implementation guidelines were revised in April 1999 with focus on effective O&M, increased public participation, control on over extraction of groundwater and stronger links with watershed management.

1.5 The revised guidelines put more emphasis on sector reforms with earmarking of 20% of the outlay for this purpose. These reforms, *inter-alia*, aim at making the programme totally demand driven and community participation in sharing of capital cost (at least 10% in cash or kind) and bearing the O&M cost fully. These reforms have been under implementation in the identified pilot districts only.

1.6 Project implementation is on cost sharing between MoRD and State Governments in the ratio of 50:50. Of the total outlay, a minimum of 25% for SCs and 10% for STs has been earmarked. In addition, a provision of 15% of funds for O&M and enhanced

role of women in making decisions on the locations of hand pumps and maintaining them is envisaged.

1.7 The revised guidelines also provide for undertaking Sub-missions to address the problems of water quality like fluorides, arsenic, brackishness, excess of iron etc. and for ensuring source sustainability through rainwater harvesting, artificial recharge etc. Up to 20% of the funds can be earmarked for the Sub-missions with a cost sharing between the MoRD and States in the ratio of 75:25. It is, however, seen that the main emphasis under these Sub-missions is on water quality related issues and not much has been done to promote the traditional practices like rainwater harvesting and groundwater recharge.

1.8 The programme mainly focuses on constructing hand pumps fitted on tube wells or bore wells as a source of supply of safe drinking water. A norm of 40 litres/capita/day (lpcd) is adopted for water supply in the rural areas. With a normal output of 12 litres per minute, one hand pump is provided for every 250 persons. It is seen that at this rate, the hand pump would be required to be in operation for 14 hours/day to meet the supply norm of 40 lpcd. An output of this kind on a continuous basis appears to be quite challenging besides involving a long waiting time for beneficiaries. A discussion with the State Government officials dealing with ARWSP indicated of frequent breakdowns of hand pumps due to poor material quality. Repairs are monitored centrally at the Panchayat/Block level and take longer time ranging between 2-3 weeks. Dependence on contractors for O&M makes matter worse.

1.9 One hand pump is located within a radius of 1.6 km in plains and or 100 m (elevation) in the hilly areas.

1.10 Annual plans are prepared by the State Governments and Submitted to MoRD for approval. It takes about 4-5 years to complete a sanctioned project.

1.11 The annual outlay of the Department of Drinking Water Supply of MoRD for water supply for 2004-05 is Rs.2900 crore. Considering an equal amount available in the State Budgets, the availability of total funds for this sector becomes Rs.5800 crore.

1.12 A publication issued by MoRD on the 15th August 2004 indicated that 99.7% of the villages already have access to safe drinking water.

2.0 TSC

2.1 The Central Rural Sanitation Programme (CRSP) was launched by Government in 1986 with the objective of improving the quality of life of the rural people and to provide privacy and dignity to women. With a view to improving the programme quality, the Indian Institute of Mass Communication was commissioned to conduct a comprehensive baseline survey in 1996-97 on the knowledge, attitudes and practices in rural water supply and sanitation. The survey showed that 55% of those with private latrines were self-motivated, only 2% claimed the subsidy as the motivating factor and 54% claimed to have gone in for sanitary latrines due to convenience and privacy. The survey also showed that 51% of the people were willing to spend up to Rs.1000 to acquire a sanitary toilet.

2.2 On the basis of these findings, the CRSP was improved and converted into the present format of the Total Sanitation Campaign (TSC). The revised programme emphasizes more on a demand driven approach with focus on information, education and communication (IEC), capacity building and human resource development.

2.3 The programme includes the following major components:

- (a) Startup activities which cover baseline survey and preparation of project implementation plan. The expenditure on this activity is not to exceed 5% of the project cost and is met fully by the MoRD.
- (b) IEC activities are intended to educate and motivate the people to create demand of sanitary toilets for households, schools, Anganwadies, Balwadies and community complexes. The expenditure on this activity should be a minimum 15% of the project cost and is shared in the ratio of 80:20 between the MoRD and State governments.
- (c) Actual construction of individual household latrines, community complexes, Anganwadi toilets, School sanitation etc.

2.4 The grant-in-aid facility for individual toilets is available for BPL families only. It is assumed that the above poverty line (APL) families will take up the construction with their own funds. Both single pit and double pit toilets are provided depending on the capacity of the beneficiaries to pay for their contribution in the cost. Government subsidy is available only for the plinth level construction i.e. pit and the platform with WC pan. The superstructure is to be provided by the beneficiaries themselves.

2.5 The cost sharing amongst the MoRD, State Government and the beneficiaries is as under:

Basic Low Cost Unit Cost (in Rs.)	Contribution (%)					
	MoRD		State		Beneficiaries	
	BPL	APL	BPL	APL	BPL	APL
Up to Rs.625 (single Pit)	60	Nil	20	Nil	20	100
Between Rs.625 and Rs.1000 (double pit)	30	Nil	30	Nil	40	100
Above Rs.1000	Nil	Nil	Nil	Nil	100	100

2.6 Based on the consideration that the cost of super structure would be nearly the same as that of the plinth level construction, the cost of a complete single pit unit and double pit unit is taken Rs.1250 and Rs.2000 respectively and the shares of MoRD, State and beneficiaries would workout as under:

Type	Share in Rs.		
	MoRD	State	Beneficiaries
Single Pit-Rs.1250	375 (30%)	125 (10%)	800 (60%)
Double Pit-Rs.2000	300 (15%)	300 (15%)	1400 (70%)

2.7 The Panchayati Raj Institution has a pivotal role in the implementation of the TSC at every stage including the social mobilization work.

2.8 The annual outlay of the MoRD for the TSC for 2004-05 is Rs.400 crore. Despite the programme being in place since 1986, nearly 78% of the rural households still do not have access to sanitary toilets.

Comparative Analysis of various project attributes of SGF Sub-programme and Government Funded ARWSP/TSC in the Water, Sanitation and Environment Domain

Sl. No.	Attribute	SGF Sub-programme	ARWPS/TSC
1	Project Drivers	Execution of project activities was through grass-root level NGOs who have closer interaction at the cutting edge and are dedicated to the cause of community. Organizational skill, proper co-ordination and orientation ensured smooth operationalisation of project activities	Execution machinery has several levels in the hierarchy. Due to a larger gap between the agencies and community, the actual needs of the latter are not perceived adequately. As such the operationalisation of work programme lacks thrust and orientation
2	Accountability	The NGO and the participating community were fully aware of their responsibilities for proper conduct of the project activities. Hence they took upon themselves the accountability for any time and cost over run, as also the quality of performance. In several projects, the cost of major items like earthwork registered significant reduction over the approved cost. Such savings were credited to the project.	Accountability is generally diffused due to multiplicity of levels and hierarchical mechanism of project execution. Savings in the approved cost are generally not seen and if there, not credited to the project and become part of the contractor's profit.
3	Time Schedule	Small project size, fixed and a small timeframe of only 12 months. In majority of the cases it was adhered to. No tenders involved. No cost overruns.	Firstly there are delays in the process of project preparation and approval which has to pass through several levels. Projects have a much bigger timeframe of about 4-5 years as the size of project itself is very large. Due to multiplicity of agencies and tendering procedure, projects invariably get extended often having both time and cost overruns.
4	Community Participation	Was an important component in the project formulation. Through the good offices of the NGO, closer interaction and participation of the community was ensured at all levels of project implementation. The	These features did not exist till Marc 1999. Even today, the community participation & education and awareness components, are not very focussed in the absence of a

		projects were demand driven and, therefore, sustainable.	dedicated driver agency for promoting motivation
5	Capacity Building	Capacity building attribute was comprehensively achieved by involving the beneficiaries in the decision making process and through effective awareness & training campaigns and exposure tours.	This attribute is weak in the absence of dedicated motivating agency at the grass root level
6	Project Governance	Local Self Government i.e. Panchayat along with elected/selected representatives of the community having deep interest in the welfare of the beneficiaries involved which ensured a quick and transparent delivery system. Physical and financial monitoring of project had a strict and regulated inspection regime to make the monitoring meaningful and credible	As the projects are of larger size with bigger timeframe, the governance is less effective due to lack of coordination between the Block and Panchayat level functions. Monitoring regime tends to be weak and generally lacks thrust.
7	Fiscal Management	Community was encouraged to contribute through general consensus to augment the fiscal resource to be used for its own welfare programme. Leakages were minimum and up to 85% of the cost went into the project hardware. This gave credibility to the NGOs and inculcated the feeling of ownership of the project amongst the beneficiaries.	Cost sharing by community under ARWSP did not exist till March 1999. In the revised programme a 10% cost sharing is proposed on pilot level only. The community is not adequately motivated to contribute due to poor credibility factor of the Executing Agency. Administrative costs are high and the real money going into the project is less. Under the TSC, where the subsidy is available for BPL families only, the community has to bear nearly 60-70 % of the cost which is quite challenging for BPL groups.
8	Gender Sensitization	Project focussed on the role of women in managing stress situations. This ensured their participation through the SHGs and O&M committees.	This attribute has been added only after April 1999. It is now part of the implementation process but the agencies are generally imperceptible to the needs of women groups
9	Overhead	Minimal	Hierarchical staff pattern

	Expenditure & Staffing		and generally unbridled overhead expenditure
10	Transparency	Total transparency in respect of financial matters viz. funds made available by donor agency, contribution raised by the community and the NGO as also the expenditure on different items of each activity. Accounts were audited in time. Similarly there was total transparency in respect to targets vis-à-vis time frame, role of community & the SHGs and method of implementation of the project	Transparency is there at government level but the fiscal management is beyond the purview of community and decisions on expenditure are unilateral.
11	Material Management	The NGO and the assigned representative of the community ensured proper quality of the material procured for the project. Beside prompt and timely action was taken to ensure that the material was in place at the time it was needed	Quality control management regime is generally not very effective as the government functionaries depend heavily on the contractors. Frequent breakdowns of hand pumps is a common feature and is due to substandard material quality.
12	Institutional arrangements of post project O&M	The project design provided an in-built system where the community was capacitated through awareness and training to undertake O&M during the post project period. Formation of SHGs, Technical & Monitoring Committees and creation of village fund (Gramkosh) etc. were some of the efforts made for the institutionalization of O&M	Not much focus on O&M till March 1999 which was one of the reasons for unsatisfactory performance. However, now O&M is an integral part but the mechanism is not very effective and result oriented. Repairs are controlled at Panchayat/Block levels and take at least 2-3 weeks. Dependence on contractors makes matter worse.
13	Project Approach	Integrated water resource management. Project supplemented groundwater recharge	Main focus on water supply through hand pumps. Project adds to groundwater depletion
14	Water Quality issues	No problem of water quality as the rainwater is always pure. At the most only disinfection through chlorination required.	With the depletion of groundwater level, complicated quality problems like fluorides, arsenic, brackishness, excess of iron etc. are encountered.

**Evaluation Report
on
Augmentation of Water Resource and Hygiene Facilities in Village Salaita,
District Etawah, U.P.**

Date of Visit 08-09 June-2004

1.0 Background

1.1 The project has been taken up in Salaita village of District Etawah. Salaita is the extreme most village complex in the west on the high ridge running along the north bank of Yamuna. It is 90 kms east of Agra and 16 kms west of Etawah. The village is located at a height of 120 m above the mean sea level. The ridge is interspersed with deep nalas which make the ravine ideal for water harvesting. Etawah is positioned between 26° 21' and 27° 1' north latitudes and 78° 45' and 79° 45' east longitudes. The present population of Salaita is 1550 comprising 820 males (53%) and 730 females (47%). The population of Scheduled Caste category of persons is only 81, which is about 5% of the total population of the village. The average literacy level is about 35% and only about 10% women can read and write.

1.2 Ex-servicemen form major part of the population of the village. The majority of the people are dependent on agriculture. Wheat, Bajra and Jowar are the main crops. Some farmers grow mustard also in the Rabi seasons. The area has an average rainfall of about 700-800 mm. The total cultivable land in the village is about 40 ha which is totally dependent on monsoon. Meagre precipitation and typical terrain configuration have resulted in semi-desert conditions all over the area. The water table is receding rapidly. The present level is about 45 m below the ground.

1.3 Before the project, the village was facing acute shortage of water during summer months. The bore wells, which are the main source of drinking water, would become dry during that period. Agriculture productivity had reduced significantly due to shortage of water. Sanitation facilities were practically non-existent in the village.

1.4 It was in this background that the water harvesting and sanitation project at Salaita was taken up under the SGF programme of the UNDP.

2.0 Scope of Project

2.1 The Sainik Foundation, an NGO, is engaged in the welfare activities of ex-servicemen in northern India. While carrying out a survey of the people living in the ravines adjoining the Yamuna river in Etawah district, the problems faced by the people of Salaita came into focus of the NGO. A pathetic statement by an old widow of the village that "she should not be solicited for her vote on every election but be shot instead, as there was no water in the village in summer" was what triggered the process of planning this project.

2.2 With a view to mitigating the problems of the villagers, Sainik Foundation surveyed the area with the senior citizens of the village to explore the possibilities of rainwater harvesting and the need for sanitation facilities. Based on the survey, and with the active participation of the community, a project proposal covering water conservation and sanitation problems of Salaita was prepared by the NGO.

2.3 The main components of the original project submitted to and approved by WAPCOS were:

Item	Quantity
(i) Construction of an earthen check dam	1 No.
(ii) Recharging of old wells	5 Nos.
(iii) Construction of ferro-cement tanks	12 Nos.
(iv) Gully Plugging of nalas	As needed
(v) Sanitation – Toilets	55 Nos.
(vi) Tree Planting	7000 Nos.
(vii) Exposure Tours	As needed

2.4 However, the NGO later on submitted a revised cost estimate to WAPCOS for a few additional items, namely: Construction of a spillway, brick pitching works on the check dam, rehabilitation of an ancient well, additional gully plugging works and plantation. These works were also approved.

3.0 Project Objectives

The main objectives of the project were:

- (i) To utilise the deep gorges of ravines for rain water harvesting by constructing a check dam
- (ii) To revive the old well to address the drinking water problems during summer months
- (iii) To construct toilets in individual houses so that beneficiaries do not go into open fields for defecation
- (iv) To construct ferro-cement tanks for rooftop rainwater harvesting
- (v) To plant trees at the check dam site to prevent soil erosion
- (vi) To take education and awareness programmes for the community

4.0 About the NGO

4.1 The Sainik Foundation is an All India Ex-soldiers' League, raised in 1997 as a non-profit, non-political, voluntary body of ex-servicemen and their wives. The Foundation is registered under the Society Act 1860. As stated earlier, the Foundation is primarily engaged in the welfare activities of ex-servicemen, 90% of whom hail from rural hinterland.

4.2 The NGO undertakes activities in the fields of health, hygiene, awareness, education, water etc. in rural areas through grooming and spreading a temper for science in the rural youth. The Foundation is structured into state, district and tehsil bodies with

their autonomous management. The hub of activity is the district headquarters. At the village level, membership is open to all self-help groups and voluntary committees.

4.3 This project has been implemented under the supervision of Major General (Retd.) A.P.S. Chauhan, Vice President of the League. The other functionaries involved in the project work include S/Shri Kalyan Singh-Field Coordinator, Mahendra Man Singh-Village Pradhan, Mathura Singh, Santosh Chauhan and Mrs. Kusuma Devi.

5.0 Criteria for Selection of Project

5.1 The main considerations in selecting this project for implementation in Salaita village were:

- (i) Acute shortage of water was severally impacting on the agricultural productivity of the farmers. Water was not available even for drinking purpose during summer months as all wells would become dry.
- (ii) Tilling of land for agriculture was done by well water, which was a laborious process. Moreover, each farmer was spending at least Rs. 1000/- for watering the field.
- (iii) Water table was going down rapidly.
- (iv) The terrain configuration with deep ravines was ideal for water harvesting.
- (v) The sanitation facilities were non-existent and the villagers were using open fields for defecation.

5.2 The village community was eagerly looking for technical and financial support for overcoming these problems and improving the environment of the village. During the course of discussion and survey with the NGO, the villagers could foresee the long-term benefits of the project in addressing their problems and removing drudgery on account of water shortage. As a majority of the population belongs to ex-servicemen, the community assured the NGO of their full support and cooperation in making the project sustainable.

5.3 The project was, thus, demand driven and had full support of the community.

6.0 Project Cost

6.1 At the time of submission of the original proposal, the estimated cost of the project was Rs.13.75 lakhs. The contribution of the community was not envisaged in the initial proposal.

Later, on approval of the revised proposal with additional components as mentioned in para 2.4 above, the cost was revised to Rs.16.72 lakhs.

7.0 Project Execution

7.1 The project was approved in January-2002 with a target of completion one year. According to the NGO, the project was completed in February-2002 with a small delay of about one-month only, which was reportedly due to delay in receipt of funds.

7.2 In terms of the scope of work of the project, the following works have been executed:

Item	Expenditure (in Rs. Lakhs)
(i) Check dam and Gully Plugging	10.75
(ii) Pitching work on dam surface	1.21
(iii) Spillway	0.62
(iv) Toilets (40 nos.)	1.56
(v) FC Tanks (6 nos. of 2000 ltr. each)	0.35
(vi) Recharging of 5 wells	0.15
(vii) Rehabilitation of ancient well	0.36
(viii) Exposure tours/training	0.21
(ix) Plantation and fencing (1000 trees)	0.26
(x) Office overheads	2.13
Total	17.60

7.3 The contribution of community in the project was Rs.1.81 lakhs, which works out to about 10% of total cost. The details are:

(i)	WAPCOS	Rs. 15.79 lakhs (90%)
(ii)	Community	Rs. 1.81 lakhs.(10%)

Total Rs. 17.60 lakhs

7.4 Being an All India Ex-Soldiers' League, the Sainik Foundation was able to obtain help in getting certain earthmoving equipments from the Army at a reasonably lower cost. Economy in cost without sacrificing quality was the main focus of the NGO. This helped in brining down the cost of works and reducing the construction period. It can be observed that the entire earthwork of about 75 m long check dam was completed in about five months. This included borrowing of about 2000 m³ of earth from 300 m upstream of the dam.

7.5 The site selection of the dam was done in consultation with AVM S. Sahani of the Development Alternatives and the Village Committee Members. The soil samples were sent for testing at the Soil Research Laboratory, New Delhi. Due to poor soil condition, it was decided to build a brick masonry hard core for the safety of the dam. The Sainik Foundation, thus, took all precautions in ensuring a technically sound and foolproof design of the structure.

7.6 One of the economic features of the dam construction is that it has been possible to complete the work at almost half the rate of Rs. 400/m³ of earthwork approved by

WAPCOS. This was possible only due to the active participation of the community in providing labour during construction and other cost cutting measures.

7.7 Another cost saving measure adopted by the NGO is in respect of construction of the spillway to allow flow of excess water during monsoon. Initially there was no provision in the budget for this work. The NGO identified an existing gully feeding the basin of the check dam about 100m north of the site. This gully provided a natural spillway, thereby saving in the overall cost. The cost of spillway has now being added in the revised cost of the project.

7.8 However, the overall cost of the dam increased from the proposed amount of Rs.8.63 lakhs to Rs.10.46 lakhs mainly due to increase in the scope of work by about 20%, borrowing earth from outside, pitching of the surface and difficult site conditions because of sandy soil.

7.9 The designed water storage capacity of the dam is 82500 m³.

7.10 The design of low cost toilets was obtained from the UNICEF. In the initial proposal, provision of single pit toilets was proposed @ Rs. 2800 per unit. The community, however, rejected this design and insisted for twin pit toilets, the estimated cost of which was Rs. 3910 per unit. Each beneficiary contributed Rs. 900 (23% of the cost) per unit. In view of this, the number of toilets was reduced from the original 55 single pit units to 40 double pit units. Locally available materials were used for construction as far as possible. The roof of the toilet has been constructed with local materials only.

7.11 The technique of rainwater harvesting and collection of water in ferro-cement tanks was unknown to the community. As such, they were initially hesitant for this component. Following intensive discussions with the villagers and readily available information on the subject, it was decided to install only six tanks, each of 2000 litre capacity on a demonstration basis against the original provision of 12 tanks. Since the technique was new to the village, the NGO arranged training of two masons at RUCHI in Himachal Pradesh, which has done an extensive work in this area.

7.12 With the construction of the check dam, it has been possible to revive the five community wells, which used to become dry during summer months. The NGO took another noble task of reviving an ancient well reported to be of the 1857 period. This well is on the Etawah – Salaita road, a little ahead of the village. Several tonnes of debries have been removed from the well. Good quality potable water is now available from the well. The well is now quenching the thirst of the villagers commuting on the road during hot summer months.

7.13 An expenditure of Rs. 21143 has been incurred on plantation of about 1000 trees around the dam as part of soil conservation measures. The NGO took help from the National Grass and Fodder Research Institute at Jhansi for seeds of fast growing grass species to be planted on the dam surface to prevent soil erosion. A tubewell has also been provided at the site for watering the plants. As a water conservation measure, the NGO has installed sprinkler system for this purpose to prevent wastage of water.

8.0 Beneficiaries Covered

8.1 Construction of the check dam has given a considerable relief to the community in the very first year. The entire population of the village has been able to reap the benefits of the facility. The availability of water for irrigation will further improve as the retention capacity of the dam increases in next one or two years. The villagers no more spend money now on watering the fields before tilling. The output from agriculture is likely to increase significantly in the near future.



A Toilet in SC Cluster

A Ferro-cement Tank in a School



8.2 With the construction of 40 individual toilets, nearly 80% of the population of the village has been covered. Of these, two toilets have been constructed in the SC community area.

8.3 As for the FC tanks, due to initial reluctance of the community, only six units, each of 2000 litres could be installed on a demonstration basis. Of these, one tank each has been put up in the two schools of the village and another two tanks have been put in the SC cluster. In addition, one unit has been put up in the house of the Gram Pradhan and the last one has been given to the Dekh Rekha Samiti (Operation & Maintenance Committee) of the village.

8.4 Recharging of the five wells and an ancient well would provide benefits to the entire population of the village. This has removed the drudgery of women, who had to travel long distances during summer to fetch drinking water.

8.5 The plantation activity will help in preventing soil erosion in the check dam area.

8.6 Training programmes and Exposures tours have not only strengthened the awareness of the community in the water and soil conservation works but also helped the villagers particularly the women groups in educating themselves on various aspects of health care.

9.0 Community Participation

9.1 The main focus of the NGO was to ensure total participation of the villagers in the project to make it sustainable. Decisions on site selection of the dam, ferro- cement tanks toilets etc. were taken collectively after surveying the area. Five village committees and self-help groups (SHG) were constituted and various responsibilities given to them during the project implementation period.

9.2 With a view to involving the District Administration in the project, the NGO invited the Chief Development Officer and the District Forests Officer to join the task force constituted for its implementation. However, there was no response from them.

9.3 The NGO held extensive consultations and exchange of views on various aspects with other NGOs, viz. Development Alternatives, AnaRDe, RUCHI, Tarun Bharat Sangh etc. All these NGOs have vast experience in water and soil conservation projects.

10.0 Education & Awareness

10.1 Since this kind of project was taken up for the first time, neither the villagers nor the District Administration were aware of such works. The NGO, therefore, considered it necessary to organize visits and exposure tours of the members of the community at places where such works have been implemented. The Sainik Foundation also developed a programme on awareness on health and hygiene.

10.2 Vice President and another senior official of the Foundation attended a Sammelan on water harvesting at Tarun Bharat Sangh, Nimmi, Rajasthan in April 2002.

10.3 An eight-member team comprising representatives of the Mahila Samiti and Jal Sanchayan Samiti attended an all India Jal Sammelan organised by the Tarun Bharat Sangh from 18th to 22nd January 2003 under the auspices of UNDP at Bhikampura, district Alwar. This was a first of its kind exposure for the women of Salaita. All issues relating to water management and conservation were addressed in the Sammelan.

10.4 A one-year distance education course for 10 girls of the village was organized for the National Open School Certificate in Early Childcare and Education. The final examination of the course was held at Delhi. All the participants were given a certificate on completion of the programme. One girl even got a job in a primary school. This was a very popular and successful programme.

10.5 A one-week health workers' course was organized in March 2003 for 10 girls and a boy of the village on health and hygiene. A retired Major lady doctor of the Army conducted this course.

10.6 A team from the Community accompanied by the Vice President of the Foundation visited Taragram of the Development Alternatives and the National Grass

and Fodder Institute Jhansi during 2002. This visit provided a good exposure to the members about the activities of the Development Alternatives in the field of rural technologies and community self help groups. At the Grass and Fodder Institute, the participants were exposed to a variety of developments in the field of grass and fodder. A few species of fast growing grass were obtained for use over the dam surface to prevent soil erosion. The NGO took help from The Central Arid Zone Research Institute, Jodhpur and the Forest Research Institute, Dehradun in selecting proper species for plantation.

11.0 Institutional Arrangements

11.1 Five SHGs and committees were put in place at the inception stage of the project.

11.2 A Jal Sanchayan Samiti to address the issues relating to the water management and conservation has been constituted. The Gram Pradhan is the Chairperson of this Samiti with four members including a woman.



A Ravine-Ideal for Rainwater

Interaction with Community in



11.3 A Mahila Samiti has been setup, which consists of a chairperson and five members. One of the enterprising women of the village who attended some of the exposure tours, namely, Smt. Kusuma Devi, is the chairperson of this committee. The main functions of the Mahila Samiti are awareness generation and capacity building. Under the auspices of this samiti, women came out of their houses for the first time for exposure tours and training programme outside the village.

11.4 Another committee called the Dekh Rekh Samiti has been constituted which performed the role of a watchdog during the construction period and authenticated all

purchase of materials. The committee is headed by an ex-serviceman of the rank of Junior Commissioned Officer and has four members including a Dalit. This committee is also responsible for the operation and maintenance of the assets including the dam.

11.5 A Swasthya Samiti has been constituted with a chairperson and four members, all female, to create awareness programme on health related issues. The Samiti, with the help of the NGO, is perusing a Distance Education and Health Awareness Programme for the villagers.

11.6 A 'Gram Kosh' (Village Fund) was established in December-2002. The Kosh will be operated jointly by the Gram Pradhan and the head of the Mahila Samiti. The funds collected under this Kosh will be utilized for O&M of the assets.

11.7 As the operation has been supervised by Sainik Foundation of ex-servicemen, special focus has been put on keeping all records of the community activities like a war diary. This will be done through a 'Gram Granth'.

11.8 Although, the facilities created, particularly the check dam are already in the hands of the village committees, the Sainik Foundation would continue to oversee the project. A six-monthly report shall be prepared and submitted to WAPCOS/UNDP.

12.0 Observations Emerging from the Field Visit

12.1 The project area was inspected on 8-6-2002. Shri A.P.S. Chauhan, Vice President of the Sainik Foundation was present during the inspection. Meetings and discussions were held with the villagers and members of the various committees to elicit information on the benefits reaching them from this project.

12.2 The check dam, the spillway, toilets, ferro-cement tanks and the recharged wells were physically inspected. The following observations emerged from the inspection and interaction with the community:

- (i) Construction of the check dam has provided considerable relief to the community during the very first year of operation. Although at the time of inspection, there was no water seen in the dam, the fact remains that the harvested water has helped recharging the water table in a significant manner. According to the estimate of the NGO, the check dam has helped the water table to rise at least by 10 ft.
- (ii) As a result of this, water has reappeared in the five old wells. An ancient well of 1857 period has also been revived. These wells are now being extensively utilized to meet the drinking water needs of the entire village.
- (iii) Agricultural soil has enough moisture now to facilitate tilling operation and villagers do not spend money any more on buying water for this purpose.
- (iv) It is expected that the water retention capacity of the dam will gradually increase with the formation of a silt layer at the bottom in next one or two years. This layer will help in balancing the percolation rate to ensure that the water remains

in the dam throughout the year and also percolates down to charge the water table.

- (v) The NGO, however, reported that construction of earthen check dam in sandy soil is a difficult task, as it requires enormous efforts to hold and compact the soil. The NGO informed that there were several emergency situations occurring during the construction period, when the earth caved in disrupting the work and threatening the safety of the people. This not only resulted in delay but increased the cost also. The Sainik Foundation would recommend a brick masonry structure only, in such places.
- (vi) The provision of a spillway is necessary for the safety of the dam. This item was not included in the original estimate but has now been included in the revised cost.
- (vii) The Sainik Foundation informed that in order to increase the capacity of the dam, its height can be increased from the present 6.5m to 9m. This can be taken up once the observation on the existing profile and the spillway are completed after the next monsoon. They are, however, looking for additional funds for this work from the UNDP.
- (viii) The villagers appeared to be very happy with the provision of toilets. During the discussions it was noted that most of the toilets are being used but still some women are going for defecation in the open fields. The head of the Mahila Samiti was advised to take up an awareness campaign in the village to educate the women about the hazards of open defecation.
- (ix) Some of the toilets were physically inspected. These were found to be well maintained. However, it was noticed that WC pans of high quality porcelain had been used. Since these are low cost options, perhaps a cheaper pan, which uses minimum water for flushing, may be a better substitute. Sulabh International has been using such pans. Money saved on this item can help in building more toilets.
- (x) Provision of six FC tanks under the project has been done on a demonstration basis to prove the technology. The NGO has been surveying the houses of the villages which are suitable for rooftop harvesting of rainwater. The NGO informed that 225 houses with a 3000 m² area have been identified for this purpose. FC tanks in these houses may be provided in future depending upon the availability of funds.
- (xi) Nearly 1000 saplings were planted in the dam area during July-August 2002. However, the survival rate was about 30% only due to dry spell and shortage of water. A bore well with a DG set has now been put in place, which is proposed to be used, among other things, for watering the plants. The community is planning to plant more trees during the coming monsoon. To save the plants from cattle grazing, fencing in the area has been provided. These measures are expected to improve the survival rate.

- (xii) It was observed that the training programmes and the exposure tours significantly helped the community in raising their education level and understanding the project better. The Sainik Foundation informed that they would continue to have such activities in future also.
- (xiii) The NGO strongly recommended integration of such projects in a holistic manner where all water and soil conservation issues in a small village like Salaita can be addressed in a single project. They suggested that the area has a great potential of harnessing solar energy which must be exploited.
- (xiv) On the whole, the NGO has done an excellent work which should be commended and encouraged. The project has started paying good dividends to the community. Women and SC groups have been closely integrated with the project. The benefits shall continue to grow as the operation of the check dam stabilizes.
- (xv) One of the important lessons learnt from this project is that construction of earthen check dam is not suitable in sandy soil areas like that of Salaita. The best option in such places is to construct a brick masonry dam.

**Evaluation Report
on
Sustainable Development of Tal Maharaja Badan Singh for Drinking Water Supply
in Sinsini Village**

Date of site visit: 11-12 June, 2004

1.0 Background

1.1 The project has been implemented in Sinsini village, which is located 30 kms north of Bharatpur in Rajasthan. The present population of the village is about 14800 comprising about 1300 families. It is reported to be one of the biggest villages of Bharatpur district. The average household size is 11. The population of males is 55% while that of females is 45%. The average literacy level is 57%. About 22% of the population belongs to SC category.

1.2 Sinsini is recognized as a heritage village because of the residence of the ruling family of Bharatpur in earlier days.

1.3 The main profession of the people is agriculture. Due to lack of infrastructure for irrigation, agriculture is rain dependent. The average annual rainfall is about 500 mm. The village faces acute shortage of water during summer months when wells and ponds around the village become dry. Bore wells are the only source of water supply for the village. The water of the wells located in the village is brackish and not potable.

1.4 To provide potable water for the village, Maharaja Badan Singh, the then ruler of the Estate had constructed a 6 ha. pond on the outskirts of the village some 400 years ago. Six wells were dug on the periphery of the pond, which were used for drinking water by the village. However, over the years, due to poor operation and maintenance, the pond nearly vanished and the land came under encroachment. Due to gradual depletion in the water table, the wells also started drying up during summer months increasing the drudgery of the village women, who have to walk 3-4 kms daily to fetch drinking water.

1.5 On the other hand, runoff during monsoon months was posing a severe problem of submergence of the sweet water wells and water stagnation in the entire village. The village community for a long time was eagerly looking forward to help towards mitigating their water woes.

2.0 Scope of Project

2.1 The Lupin Human Welfare and Research Foundation (LHWRF) is an NGO and has been actively engaged in the welfare activities in the rural areas of Bharatpur district. The NGO, during the course of their routine activities came across this problem in the year 2000. The plot of land where once the pond existed was under encroachment over half of its area. A survey of the area indicated that the plot of land was ideally suited for rainwater harvesting. When LHWRF discussed the proposal, the villagers were only too

glad to solicit their cooperation. The village community ensured its help in removing the encroachment from the land. This was how the project was conceived in the year 2000.

2.2 The project proposal comprised the following components:

- (i) Excavation of the 6 ha. pond and removal of about 1.2 lakh m³ of earth;
- (ii) Construction of dykes around the pond with the excavated earth;
- (iii) Plantation of trees over the dykes;
- (iv) Renovation and up gradation of six wells along the shoreline of the pond. One of these wells is a historical one;
- (v) Construction of drain for improvement in catchment area to bring rain water in the pond;
- (vi) Construction of temporary sand bag weir to prevent the backflow of water from the pond;
- (vii) Construction of approach road; and
- (viii) Pisciculture in the pond.

3.0 Project Objectives

The principal objective of the project was to refurbish the pond, named after the then Maharaja Badan Singh, and revive the 6 sweet water bore wells on the shoreline of the water body. Upgradation of the bore wells, provision of approach road and proper drainage were also aimed at to make the project sustainable. Participation of community in the project was the focal point.

4.0 About the NGO

4.1 LHWRF is an NGO promoted by the Pharmaceutical giant Lupin Laboratories towards fulfilling its Corporate Social Responsibility (CSR). The NGO is engaged in multifarious rural development activities in Rajasthan since 1988. Though LHWRF does such works in Maharashtra, Madhya Pradesh and elsewhere in Rajasthan, the scope of its activities in Bharatpur is so extensive that it is often perceived as a parallel government.

4.2 In the last 15 years, LHWRF has put up 125 schools (either singly or with government help), provided drinking water facilities in 80 villages, and helped 25000 people cross the 'poverty line'. The NGO has set up a fish hatchery to supply fish seeds to the community on no profit no loss basis. They have started a novel programme called the 'Apna Gaon Apna Kaam' which means you work for the welfare of your own village. At the heart of the LHWRF CSR model lies the concept of convergence, which envisages 'LHWRF putting some money, government puts some more and the beneficiary puts the rest'. The programme has become extremely popular.

4.3 The registered office of LHWRF is located at 160, Krishna Nagar, Bharatpur-321001, Rajasthan.

4.4 The project under consideration has been implemented by a team of technical and social workers under the guidance of Shri S.R. Gupta, Executive Director, LHWRF and with the active cooperation of the village community.

5.0 Criteria for Selection of Project

5.1 The culmination of the project was a result of an intensive survey by the NGO to study the acute problem of drinking water faced by the village community during summer months. The community knew the problem but did neither have the solution nor the resources to realize it. Utilizing the support of the villagers and the expertise of LHWRP in such works, a need-based project for harnessing monsoon runoff was prepared with the prime objective of meeting the drinking water requirement of the village.

5.2 Realizing the fact that the project was expected to remove their age-old drudgery, the entire village community was behind the NGO to make the project a success story.

5.3 The project was, thus, demand driven.

6.0 Project Cost

The estimated cost of the project submitted by LHWRP for approval was Rs.15.86 lakhs. The project envisaged sharing of cost amongst WAPCOS, community and LHWRP as under:

(i)	WAPCOS	Rs. 9.25 lakhs (58%)
(ii)	Community's contribution	Rs. 2.48 lakhs (16%)
(iii)	Contribution from LHWRP	Rs. 4.13 lakhs (26%)

Total	Rs.15.86 lakhs
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7.0 Expenditure

7.1 According to the project completion report submitted by the NGO, the project was completed on 15.12.2003. Thus there was no time over run in the project.

7.2 The total expenditure booked by the NGO on completion of the project is Rs.1417200 the item wise break up is given below:

(in Rupees)

(i)	Excavation of pond	914640
(ii)	Plantation & Agro-forestry	21640
(iii)	Construction of dykes (serving as earthen road)	41975
(iv)	Cement top to stop silt and boulder pitching	165963
(v)	Upgradation of 5 bore wells	147010
(vi)	Excavation of trenches	7800
(vii)	Pisciculture	17000
(viii)	Upgradation of the historical well	84078
(ix)	Administrative Expenses	17094

Total	141720
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(Source: Income and expenditure account of the project for the period from 13.11.2002 to 15.12.2003 duly certified Chartered Accountants)

7.3 As the grants-in-aid under the Small Grants Facility (SGF) programme was limited to Rs.9.58 lakhs, the balance cost has been shared by LHWRF and the village community. The cost sharing is as under:

	(in Rs. Lakhs)	%ge
Grant-in-aid under SGF Programme	9.58	67.6
Contribution by villagers	1.40	9.9
Contribution by LHWRF	3.19	22.5
Total	14.17	100.0

8.0 Project Execution

8.1 The project was sanctioned on 26 August 2002 and the agreement between the NGO and WAPCOS was executed on 15 October 2002. Physical implementation of the project was started from 25 December 2002 with the target of completion in 12 months.

8.2 Immediately upon approval of the project, an intensive awareness campaign was taken up by the NGO to sensitize the village community. The community not only facilitated removal of encroachment from the land identified for the pond but also provided valuable inputs in the design and implementation of the project. The villagers had the full knowledge of the quantities and direction of flow of runoff, which helped in constructing the inlet drain to maximize the intake of water in the pond. The excavation of the pond was done by way of Shramdan in which the entire village participated wholeheartedly. Local and indigenous methods were used as far as possible to ensure community participation. This provided multifarious benefits. One, it offered employment to the villagers, though for a short duration, two, it brought down the cost and lastly but more importantly, it inculcated the sense of ownership amongst the community.

8.3 The impact on the Shramdan by villagers can be well appreciated by the fact that the cost of excavation was reduced from the PWD scheduled rate of Rs.21/m³ to about Rs.16/m³. Thus, on the excavation work alone, there was a saving of Rs.6 lakhs. Use of cut and fill method for construction of dykes also helped in optimizing the cost as the entire excavated earth was utilized on the project site itself.

8.4 The NGO reported that about 1000 trees have been planted on the dykes towards eco-development of the area. An amount of Rs.21640 has been spent on this activity. During the inspection of the site it was, however, observed that there was no protection made for the plants and as such most of them were eaten away by cattle.

8.5 A provision of Rs.17000 has been made towards pisciculture in the pond. This activity is expected to generate fairly good revenue, which would help sustaining the operation and maintenance of the system.

9.0 Institutional Arrangements

9.1 The issues of institutional arrangements have been well addressed in this project. A 14 member Organizing Committee of villagers (under the Chairmanship of one Shri Shyam Lal) was constituted for implementation of the project. The committee had several meetings where the project details, the problems and the possible solutions were discussed to arrive at a sustainable alternative.



Interaction with Community

Interaction with Community



9.2 Another 21- member Operation and Maintenance (O&M) Committee has been constituted for overseeing the running of the project after its completion. The Committee has a chairperson and a treasurer and 19 members, one from each ward, to ensure equitable representation of the entire village in the project.

9.3 Women of the village were the main sufferers due to the drudgery of bringing water on their head from longer distances prior to this project. Therefore, they have been motivated to form Self Help Groups (SHG) to ensure rational use of potable water and for the second phase expansion of the project. Five such SHGs have been constituted with 12 members in each group. These groups have been able to accumulate funds amounting to Rs.24000, part of which may utilized to meet expenditure on O&M.

9.4 According to the NGO, two more committees, one for plantation and another for pisciculture are proposed to be constituted shortly.

10.0 Educational Awareness

The village community has been actively involved in the project right from concept to the commissioning stage. However, the NGO should initiate documentation and dissemination of the best practices and success stories elsewhere in the states, where they are active. They should also hold workshops and group discussions to share their experience with others to facilitate replication of such initiatives across the state. The NGO should approach the state government to support such activities.

11.0 Observations Emerging from the Field Visit

11.1 The project area was inspected on 11-12 June 2004. Discussions were held with the NGO. Interviews of men and women fetching water from the pond/wells were taken at the site. A meeting with the members of the community, both males and females was held in a school building in the village, the same evening. About 20 males and an equal number of female members attended the meeting.

11.2 The observations emerging from the inspection and interaction with villagers and NGO are summarized below:

- (i) At the time of site inspection, the pond was practically dry except a few isolated patches of water in some parts. The villagers informed that water harvested during monsoon remained in the pond during the first year for nearly 9 months. The retention period would gradually improve as the soil in the pond bottom gets stabilized and its retention capacity increased. In any case, the harvested water has not gone waste but it has percolated down the ground level which has facilitated recharging of the six wells along the shoreline of the pond. That the wells were operative in the midst of thick summer month of June is a clear indication of this phenomenon.
- (ii) With the recharging of the sweet water wells, which now operate round the year, the entire community appeared to be happy and satisfied. At the time of site visit (about 4 pm on 11.6.2004) there were nearly 50 women fetching water from the well. In addition, there were 3-4 bullock carts carrying water in large drums for distribution in the village. The scene resembled a rural fair.
- (iii) The ladies carrying water pots on the head and their faces covered told that their time for fetching water has been considerably reduced with the commissioning of the pond.
- (iv) It was, however, observed that due to the constraint of distance, the entire village is not able reap the benefit of the facility. The village is too big and for those living on the other side of it, the distance to the ponds becomes a discouraging factor. Most of these households spend Rs.10/day to buy water.
- (v) In this background, one of their common demands was to provide piped water supply to the village. The NGO was advised to tap the MP/MLA local area development funds for this purpose. Alternatively, they can also approach the Ministry of Rural Development for help under the Accelerated Rural Water Supply Scheme.



A View of the Pond

Beneficiaries Fetching Water



Villagers deepening the Pond

A view of the Fish Hatchery



- (vi) Another interesting activity observed at the site was that several tractors were excavating earth from the dried portion of the pond to increase its water retention capacity. This only indicates how well the concept of the rain water harvesting has worked and how deep the sense of ownership has developed amongst the beneficiaries and stakeholders.
- (vii) According to the NGO, Pisciculture in the pond was started in 2003-04. The pond was stocked with 2 lakhs fry of major carp. However, because of new digging the percolation rate was high resulting in poor growth. The NGO proposes to restock the fish this year again and hopes it will start yielding revenue shortly. The activity would be maintained by a SHG constituted for this purpose and income from it would be utilized to meet O&M cost of the project.
- (viii) In view of the poor survival rate of plantation, the NGO was advised to provide the necessary protection. The NGO is planning to plant more trees during the forthcoming monsoon season with proper protection.

**Evaluation Report on
Sustainable Development through Water Conservation in Pairvi Khud Micro
Watershed Area; Rajgarh, District Sirmaur (H.P.)**

Date of Visit: 15 June 2004

1.0 Background

1.1 The Project Area is located in the Ser-Jagas Panchyat comprising five villages and six hamlets in Sirmaur District of Himachal Pradesh. The villages are Neri, Ritoli, Ser, Jagas and Gheel. The implementation area is located about 8 kms west of Rajgarh and 40 kms from Solan at altitudes between 1200 and 2010 m. The latitudes and longitudes of the place are 30° 51' to 30° 53' north and 77° 15' to 77° 18' east respectively. Except Neri, which is on the road, all other villages and hamlets are remotely located. While Jagas is about 7 kms, the other villages are 2-3 kms away from the nearest road.

1.2 The present population of the project area is about 1600 comprising 325 families. The population comprises 51.5% males and 48.5% females. About 60% population belongs to the Scheduled Caste category, which is the highest percentage in the State. The literacy level is 80%. The main profession of the villagers is agriculture. Maze, wheat and vegetables are the major crops. The average land holding is about a hectare. The total cultivable land in the project area is 306 ha. of which about 80% is rain fed and only 20% of it is irrigated.

1.3 The area has an average rainfall of about 1300 mm which is above the national average. However, most of the rainwater flows down as runoff quickly leaving very little for the agriculture and drinking needs of the population. Rainwater runoff also results in soil erosion and land degradation. Acute shortage of water during dry months has severely affected the income of the villagers, who solely depend on agriculture. Low moisture- retention capacity of soil leads to low agricultural productivity. Lack of fuel wood and fodder is another problem arising from acute water shortage. The women have to undergo severe drudgery for bringing drinking water from long distances.

2.0 Scope of Project

2.1 The Rural Centre for Human Interests (RUCHI) is an NGO actively engaged in the integrated rural development activities in the Solan and Sirmaur districts of Himachal Pradesh. The NGO has close interaction at the Panchayat level in these districts. With a view to mitigating the problems faced by the community in the project area due to water scarcity, the NGO, in consultation with the Panchayat authorities, prepared a proposal of micro-watershed development for consideration under the SGF project of UNDP.

2.2 The proposal comprises the following components:

Item	Quantity
(i) Check Dam	1
(i) Farm Ponds	2
(iii) Percolation Ponds	4
(iv) Ferro Cement Tanks	10
(v) Trenching	320 m ³
(vi) Gully Plugging and Stone Bunding	100 m ³
(vii) Plantations	15000
(viii) Use of Terra-cottem (Soil Conditioner)	Lump sum

3.0 Project Objectives

The main objectives of the project were:

- (i) To utilize the available water resources through rainwater harvesting to fulfill the irrigation and drinking water needs of the farmers
- (ii) To address the problems of fuel and fodder faced by the villagers
- (iii) To encourage the community to adopt water and soil conservation measures to mitigate drought conditions and enhance food security
- (iv) To introduce new technologies for improving the soil condition and energy conservation

4.0 About the NGO

4.1 RUCHI, a non-political, non-profit-making society under the Society Registration Act (1860) was established in 1980 in a remote village Chopal in Shimla district. The Registered Office of the NGO is located at Shalna, Rajgarh in Sirmaur district and Head Office at Bandh, P.O. Bhaguri in Solan district.

4.2 RUCHI set up a Technology Resource Centre (TRC) at its Head Office at Bandh in 1994 with the support of CAPART (Council for Advancement of People's Action and Rural Technology) of the Ministry of Rural Development. The TRC has developed projects in over 200 villages in the steep hilly terrain of Rajgarh and Dharampur development blocks. A number of innovative and appropriate rural technologies have been demonstrated at the TRC. Some of these are Hydraulic Pump, Vermi-composting, Poly House, Electric Fencing, Compartmentalized Trash Bins etc. The NGO has an elaborate demonstration model of rooftop rainwater harvesting set up at its Shalna office, which meets the drinking water needs of the Centre round the year.

4.3 The major thrust areas of RUCHI are micro-watershed development, environment, technology promotion, health care, education and awareness generation. The NGO arranges regular exposures and training programmes, which are attended by people from all over the country. The micro-watershed developed by the NGO at Shilanji and Jagher-khud are regarded as some of the best practices and examples of people's participation in soil and water conservation.

4.4 The NGO has a regular staff of 35 persons having expertise in watershed management, engineering and other related areas. Another 30 persons are employed on

contract basis on various projects. Shri Dharamvir Singh is the Executive Director and Head of the NGO. The main sources of project funding of RUCHI are CAPART and District Rural Development Agency (DRDA). Specific project funds are also received from international donors from Germany, Japan, New Zealand and Norway. The annual budget of the NGO is about Rs. 50 lakhs.

4.5 The project under consideration has been implemented under the supervision of Shri Nagendra Chauhan assisted by Shri Yudhvair Raina and a woman organiser Ms. Vijaya Pundhir. All the team members have experience in implementing similar projects in the area.

5.0 Criteria for Selection of Project

5.1 The main and the foremost consideration in selecting the area for this project was that unlike the other neighbouring Panchayats, no development work was ever taken up in the Ser-Jagas Panchayat for the benefit of the Scheduled Caste population. The farmers were facing acute water shortage for drinking as well as irrigation. With adequate runoff, the location of the check dam was ideal. The Panchayat was pursuing the NGO for a long time to help mitigating their problems. They assured the NGO of their full cooperation in the implementation and running of the project. The villagers were also ready to share part cost of the project according to their financial capacity.

5.2 The project was thus action oriented and demand driven and had the full support of the community.

6.0 Project Cost

At the time of submission of the proposal, the estimated cost of the project was Rs.10.43 lakhs. No contribution from the beneficiary was envisaged in the original proposal.

7.0 Project Execution

7.1 The project was approved on 1.11.2002 with a completion period of one year. The project completion date, as reported by the NGO, is 28.11.2003. The small delay of 28 days was reported to be due to delay in receiving funds.

7.2 In terms of the scope of work covered in the project, the following works/activities have been executed:

Item	Quantity	Details	Cost (in Rs. lakhs)
(i) Check Dam at Ratoli	1	capacity- 5 lakhs litres.	1.20
(ii) Farm Ponds one each at Neri and Ser	2	capacity-1.1 lakhs litres each	1.60
(iii) Percolation Ponds two each at Jagas and Ser	4		0.90
(iv) Ferro Cement Tanks one for community and 9 for individuals	10	2500 litres-9 3000 litres-1	0.75

(v) Trenching	320 m ³	0.50
(vii) Gully Plugging and Stone Bunding	100 m ³	0.50
(viii) Plantation	15000 nos.	1.50
(ix) Application of Terra Cotta	Lump sum	3.15
(x) Miscellaneous and Administrative Cost		3.63
Total		13.73



Gully Plugging

Project Beneficiaries



7.3 Check dam and farm ponds are aimed at storing rainwater runoff for use in irrigation of crops during dry periods. Farm ponds are cemented tanks serving as reservoirs to store rainwater. Percolation tanks have been constructed at the top of the hill so that these can recharge the ground water besides serving as a drinking water source for animals and wildlife. These are earthen structures constructed by excavating the earth.

7.4 Ferro-cement tanks are meant to store rainwater harvested from rooftop. Out of the 10 units, one tank, each of 2500 litres, has been provided to each of the nine individual beneficiaries, who contributed a cash amount of Rs.600 each towards their share in the cost. The remaining one tank has been provided for community purposes at Ser village. The capacity of this tank is 3000 litres.

7.5 Trenching helps in moisture retention in the soil. This was done around the land used for plantation.

7.6 Gully plugging and stone bunding help in reducing the force of the water flow and thus facilitate in controlling soil erosion. The gully plugging also saves the dam structure from any damage due to the velocity and force of runoff.

7.7 The plantation work included 10500 devdar, 4000 mulberry and 500 willow plants. Out of the 10500 devdar trees, 8000 were planted under community plantation on the top ridge at Jagas and 100 plants were given to each beneficiary in Ser Jagas and Neri village. In addition, grass root plantation comprising 2000 Lahsunia and 18000 Napier/Sterea plants was also taken up. The Napier/Sterea plants were distributed to women for growing in their own land.

7.8 The use of Terra Cotte was a step towards educating the people about the latest technologies available for farming. Terra Cotte is a soil conditioner. It is a polymer that can absorb water nearly 150 times its weight. It can be put in a small quantity in the root of the plant where it becomes the source of water and thus greatly enhances the plant growth even during dry periods. Terra Cotte was applied to fruit crops (peach), tomatoes, capsicum, garlic, peas and devdar plantation.

7.9 In addition to the above core activities, two training courses each of one-day duration were organized at the local community center. The programmes were attended by more than 100 farmers.

7.10 An exposure tour of farmers was arranged to the Shilanj and Jagher-khud watersheds, which are the success stories of micro-shed development in the area. Farmers were also taken to the Y.C. Parmar University of Horticulture and Forestry at Nauni (Solan).

7.11 A workshop was conducted in November 2003 on watershed management techniques and agriculture extension. The workshop was attended by nearly 80 participants including an official from WAPCOS. The participants were distributed packets of Terra Cotte for wider propagation of this innovative material.

8.0 Community Participation

8.1 The main focus during the project execution was to involve the community in decision making. The Panchayat played the leading role in assisting RUCHI in the timely implementation of the project. Sites for different activities were selected through the process of discussion and collective survey of the area. Actual project implementation was done by the Gram Sabha. People's participation was solicited as Shramdan during the construction of the check dam, farm ponds, percolation tanks and ferro-cement tanks. Their labour input was regarded as their part contribution in the cost of the project. In addition, a contribution of Rs.600 each was made by the 9 individual beneficiaries of the ferro-cement tanks towards their share in the cost.

8.2 Locally available stones were used as the main construction material. These were supplied by the beneficiaries, which was taken as their part contribution in the project cost. Even the masons were taken from villages and trained as a step towards enhancing the capacity of the local people.

8.3 As the work progressed and after the exposure tours, the villagers started realizing the long-term benefits of the project and their responsibility in making it sustainable. Training programmes, exposure tours and workshop greatly helped in ensuring community participation in the project.

9.0 Expenditure

9.1 The total expenditure incurred on the project has been reported as Rs.13.73 lakhs (Para 7.2 above). This includes a grant component of Rs.10.43 lakhs from UNDP (76%) and beneficiaries' contribution of Rs.3.30 lakhs (24%). The beneficiaries' contribution consists of Rs.5400 (1.6%) cash and the remaining amount of Rs.324000 (98.4%) in the form of labour and material.

9.2 The NGO reported that the final utilization certificate has already been sent to WAPCOS.

10.0 Beneficiaries Covered

10.1 Due to geographical constraints, facilities like check dam and farm ponds have not been able to cover the entire population of the project area. According to the information given by the NGO and some of the members of the community, about 50% of the population of the Panchayat has been reaping the benefits from this initiative.

10.2 The farm pond at Ser will benefit and cultivate an area of 5 ha. Total 12 families of Ner village will reap the benefits from the other farm pond. This pond will also irrigate 5 ha. of cultivable waste land.

10.3 Provision of ferro-cement tanks will help 9 families in Ser, of which 8 families belong to SC category and another 22 families in Jagas, where a community tank has been put up towards meeting their drinking water needs. The community tank was constructed on the specific request of the Mahila Mandal of Ser village. These facilities will help removing the drudgery of the women who used to spend hours to fetch drinking water from distant places.

10.4 The check dam will provide storage of about 5 lakh litres of water for irrigation during dry months of the year. Besides, it will also help significantly in ground water recharge. Total 25 families of village Gheel will get the benefit of the facility, which will cultivate about 25 ha. of waste land.

10.5 Plantation will help increasing the green cover and soil conservation. Use of Terra Cottem has provided the villagers an exposure to the latest technological developments in agriculture.

11.0 Education and Awareness

11.1 A workshop on the watershed management technique and agriculture extension held in November 2003 was an important step towards addressing the education and awareness issues. The workshop was attended by over 80 farmers, 10 watershed committees and some village officers of Himachal Pradesh. Among the participants, there were a good number of women who contributed in a healthy manner.

11.2 Officials of other Panchayats shared their views on floriculture, an innovative income generating activity for rural poor. They shared their total experience from cultivation to the marketing of the floriculture produce.

11.3 Views were exchanged on other important issues related to community participation, role of self-help groups (SHG), advantages of Terra Cotte etc. On the whole, this single step created the much-needed awareness amongst the participants of the long-term benefits of such projects which helped soliciting their active participation in the initiative.

11.4 Two training programmes and a couple of exposure tours of farmers to similar demonstration projects and educational institutions further helped in consolidating the community participation in the project.

12.0 Institutional Arrangements

12.1 Three SHGs, two of women and one of men have been formed. The women's groups have a membership of 15 persons and the men's group has 20 members.

12.2 The operation and maintenance of the check dam is at present with RUCHI. It is proposed to hand over the facility to the Panchayat shortly. Considering the nature of works covered in the project, no major expenditure on operation and maintenance is needed. Therefore, with the training support provided by the NGO, it will be possible for the Panchayat to maintain the facility effectively and independently. The farm ponds, percolation ponds and the plantation works are being looked after by the beneficiaries themselves.

12.3 The women's SHGs are collecting Rs.10 per family per month in their area. The men's SHG collects Rs.20 per family per month. The funds so collected are given on 12% interest to the needy persons for such activities as purchase of seeds, house construction, health care etc. The interest earned from the kitty is distributed amongst the beneficiaries. This has become an additional source of revenue particularly for women of the Panchayat.

13.0 Observations emerging from the Field Visit

13.1 The project area was inspected on 15 June 2004. Shri Nagendra Chauhan, the key person in the project implementation was present during the inspection.

13.2 A farm pond, a percolation tank, the check dam, gully plugging, trenching site and ferro-cement tanks were inspected. Meetings were held with some of the beneficiary families to elicit their views on the project. On the basis of interaction during inspection the following observations emerged:

- (i) Provision of farm ponds and check dam has benefited the farmers significantly. With improved water availability now, more wasteland has come under cultivation and farm income has increased considerably. According to Shri Suresh Kumar and Shri Pawan Kumar of Neri village, with the provision of a 1.1 lakh litre farm pond in the village, their annual income has increased from

Rs.30,000 to Rs.50,000. The population of this village is about 250 comprising 19 families. Every family has the same story to narrate. However, due to geographical constraints, the check dam and the farm ponds are able to cater to only about 50% of the cultivable land in the village. The villagers feel that a few more check dams may change the socio-economic picture of the whole area.

- (ii) Another problem facing the villagers is in respect of conveying the stored water to the fields. Due to poor financial resources, they cannot afford to have GI pipe network for this purpose. Alternatively, they have to depend on the polythene/rubber pipes, which have a very short life due extreme climatic conditions in the area. A permanent pipe network for water conveyance is a common expectation of the people.
- (iii) Prior to this project, most of the women of Ser and Jagas village were to go about 0.5 km to fetch drinking water every day. This was taking a considerable time and labour. Provision of ferro-cement tanks in these villages has changed the scenario. Good quality potable water is now available at their doorstep. This has removed the drudgery of the women, who can now utilize their saved time for other productive work. What is more relevant is that the facility of FC tanks has significantly benefited the hitherto deprived SC families. Due to inherent advantages, the demand of FC tanks in the project area is increasing. According to the NGO, only about 50% of the population is covered. Provision of more FC tanks to cover the remaining families would be of great advantage to the project.
- (iv) Provision of percolation tanks will help raising water table besides serving as a source of drinking water for the grazing cattle and wildlife. But seeing the total area covered under this project, two tanks are far too short to fulfill the objective. These are low cost options which render significant environmental benefits. Therefore, most of the families are expecting more of such tanks in their Panchayat area.
- (v) Plantation of about 15000 trees and grass root plants were aimed at providing fuel and fodder to the villagers. However, the survival rate was reported as 50% only. There is a possibility to increase the survival rate further by proper supervision and care. The NGO has taken note of it and proposes to seek more intensive participation of the community for awareness generation in this regard. Participation of women in grass root plantation in their own land will go a long way in sustaining this activity. It was informed that out of the 7000 private plantation, nearly 1000 plants have been burnt due to forest fire. This is a common problem facing the forest areas. Proper supervision and an alert community only can help averting such incidences.



RUCHI Office at Rajgarh

Water Harvesting Structures



- (vi) Terra Cotte is a multi-purpose soil conditioner extremely useful in moisture retention, reduction in fertilizer application and increasing the overall plant productivity. It is applied in the root system of the plants, where it remains active for 8-10 years. This material is very useful in water scarce areas. However, it is a high cost item selling at Rs.500/kg. About 125 beneficiaries have been covered for application of Terra Cotte under this project. Depending upon the capacity, 1 kg to 10 kg of Terra Cotte was distributed to the farmers free of cost. An expenditure of Rs.3.15 lakhs has been incurred on this activity. Farmers were also educated of the benefits of this polymer through the workshop. However, according to the NGO, the response of the farmers has not been encouraging. The following factors are reported to be responsible for this situation:
- (a) The cost of the material is beyond the affordability of an average farmer, who is from the low-income group. Although, the material is to be applied once in ten years, the immediate cash outgo is a severe constraint for a poor farmer.
 - (b) In order to get the maximum benefit from the application of the polymer, it is necessary that it remains lodged underground in the plant root system. However, It is observed that the polymer comes to the surface when soil gets inverted during tilling operation. In that case, the moisture retention quality of the material is not helpful any more to the plant growth. It was informed that the application of the polymer is useful only when it is applied in the pit for new plants. It is also useful for tuber crops like garlic, ginger etc.

- (vii) RUCHI is of the view that the application of Terra Cottom would be more popular with the higher income group farmers. In the remote hilly areas like those of Himachal Pradesh, alternative facilities like check dams and farm ponds are comparatively more economic and useful. According to RUCHI, with the expenditure of Rs.3.15 lakhs which has gone on the application of the Terra-Cottom, it would have been possible to construct 1 check dam, 2 farm ponds and 2 farm reservoirs. With these facilities, at least 20 ha. of additional land would have come under cultivation.
- (viii) Another observation emerging from the site visit is that such projects should not be rushed in 12 months time. It takes a great deal of time to make the community aware of the long term benefits of such programmes. It is only after that that their participation in the programme can be ensured. RUCHI took 2-3 years in completing similar other projects and got better results of community participation.
- (ix) A common demand of the villagers was for toilets. Most of the families do not have toilets in their house. As such, the family members including women go for open defecation which is a health hazard. Integration of sanitation with the water and soil conservation will make the programme more popular.

**Evaluation Report
on
Sustainable Development of Industrial Estates of Himachal Pradesh through Joint
Industrial Planning & Management**

Date of Visit: 16-17 June, 2004

1.0 Background

1.1 The small projects sanctioned under the SGF programme are mostly in the water and soil conservation and sanitation sectors. All these projects have been implemented by Non Government Organizations (NGOs). This project, however, falls under a different category of monitoring of industrial pollution.

1.2 Unplanned growth of industries and increasing anthropogenic pressures have led to severe environmental degradation of our natural resources. Whether it is air, water or forest, the impact of haphazard growth can be seen everywhere.

1.3 Until 1970s, the entire Himachal Pradesh was almost a no industry zone. It was only in early 1980s that the State Government initiated efforts towards industrialization by offering several incentives and facilities to entrepreneurs. Today, there are 174 medium and large-scale and 27000 small-scale industries located in 20 industrial estates. Industry accounts for about 10% of the GDP of the State.

1.4 Himachal Pradesh is drained by five major river systems, namely: Chenab, Ravi, Beas, Sutlaj and Yamuna. There are several other small rivers flowing through the State which are tributaries of these major rivers. Kaushalya, Markenda, Swan and Sirsa are the small rivers draining the four industrial areas under consideration of this project.

1.5 This project is a detailed Study aiming at preparing a database and status report on the current pollution scenario in the four industrial estates, namely; Parwanoo, Baddi-Barotiwala, Mehatpur and Kala Amb. There are 876 industries in these estates of which 135 are in the large and medium sectors and the remaining 741 in the small-scale sector.

1.6 The category-wise details are as under:

Industrial Estates (River)	Population	No. of Industries			Names/Category of Major Industries
		Large & Medium	Small	Total	
Parwanoo (Kaushalya)	6000	50	350	400	Gabriel, Purolators, Eicher, Samtel, HPMC.
Mehatpur (Swan)	6500	35	-	35	Rangar Breweries, Him Valves, Extol chemicals, Him Steel, Liquor & Bottling Plant, Spatia Chemicals, Punjab Laminates etc.

Baddi-Barotiwala (Sirsa)	1,50,000	46	325	371	Textiles, Pharmaceuticals, Food & Beverage, Plastic Products and Packaging.
Kala Amb (Markanda)		4	66	70	Pulp & Paper, Textiles, Metal Finishing and Electroplating.
TOTAL		135	741	876	

1.7 Lack of infrastructure for handling domestic sewage and municipal solid waste in most of the towns and cities of the State has led to disposal of such wastes into open drains, where industrial effluents – in partly treated and partly untreated form - are also discharged. These drains finally discharge the combined wastewater into rivers resulting in severe water pollution. The rivers and tributaries affected by the disposal of mixed effluents from the four industrial estates are Sirsa, Swan, Kaushalya and Markanda.

2.0 Objective of the Study

The main objectives of the Study were:

- (i) To create awareness amongst the stakeholders about environmental degradation due to various activities of the industrial estates and their role in preservation and improvement of environment.
- (ii) To ensure participation of all the stakeholders including individual industries, industrial associations, communities, NGOs, local bodies, industrial workers, Government Departments etc. in the waste water planning and management.
- (iii) To evolve Joint Industrial Planning and Management (JIPM), which would ensure participation of all the stakeholders in planning and management of the wastes emanating from the industrial estates.
- (iv) Besides this, the local Industries Associations would also be involved in the process of self-regulation to meet the permissible limits of various parameters through a Self-Regulatory Order Mechanism.

3.0 Implementing Agency

The Himachal Pradesh State Environment Protection and Pollution Control Board (HPSTEPPCB) was commissioned to conduct the Study. The following personnel of the Board were involved in the project implementation:

- | | |
|--|--------------------------------------|
| (i) Dr. Madhu Soni, Principal Investigator | (ii) Er. Chetan Joshi, Team Member |
| (iii) Er. Shirawan Kumar, Team Member | (iv) Er. Avinash Shards, Team Member |
| (v) Er. Brij Bhushan, Team Member | (vi) Er. S.K. Dhiman, Team Member |
| (vii) Dr. Harish Sharma, Team Member | (viii) Mr. Anup Vaidya, Team Member |

4.0 Methodology

4.1 One of the main objectives of this Study was to identify the sources of pollution of water bodies/rivers from the four industrial estates. Accordingly, a number of sampling points were fixed so as to assess the pollution generated from all possible sources and impact of such sources on water quality of the drains and the receiving water body. With a view to ensuring representative sampling, samples were collected during all the four seasons of a year. The samples were analyzed in the laboratories of the Board for the following parameters:

pH, Conductance, Total Dissolved Solids, Total Suspended Solids, Temperature, turbidity, Dissolved Oxygen, Biochemical Oxygen Demand, Chemical Oxygen Demand, Chlorides, Sulphates, Nitrates, Alkalinity, Acidity, Salinity, Total Hardness, Calcium, Magnesium, Total Chromium, Iron, Zinc, Cobalt, Nickel, Lead, Copper, Total cyanide, Phenol, Total Coliform, Faecal Coliform etc.

4.2 Thus a very wide spectrum of parameters was selected to determine all kinds of pollutants generated from the study area.

4.3 In order to assess the impact of pollutants, samples of ground water at various possible locations were taken.

5.0 Criteria for Selection of Study Area

Out of the 20 odd industrial estates in Himachal Pradesh, these four estates are major polluters. The rivers receiving pollution from these areas are used for water supply and irrigation purposes. Moreover, some of these rivers or their distributaries flow down to the neighbouring States. It was, therefore, felt by the HPSTEPPCB to prepare a State of Pollution Report in these areas with the ultimate objective of developing an action plan of pollution abatement through self-regulatory mechanism of JIPM.

6.0 Project Cost and Expenditure

6.1 The project was approved in January 2002 at an estimated cost of Rs.13.27 lakhs and was to be completed in 12 months. However, the duration was extended by six months and the Study was actually completed on 31.8.2003.

6.2 According to the Board, the extension was on account of the fact that the correlation established between the pollution load generated and the impact reflected on the quality of recipient water bodies demanded inclusion of ground water monitoring. The additional monitoring could be completed in February 2003 only. The interpretation of the huge data generated from the Study needed at least an additional six months to prepare the action plan through JIPM.

6.3 The item-wise details of expenditure are as under:

Item	Expenditure in Rs.lakhs
(i) Monitoring, sampling and analysis	8.77
(ii) Seminars, camps, workshops	1.00

(iii)	Publicity and extension	0.50
(iv)	Eco-development work through local bodies	1.00
(v)	Environment audit/waste minimization	2.00
Total		13.27

7.0 Outcome of Study

7.1 The outcome of the Study is an extensive database in which the various sources of pollution, quality of effluents generated by each industry, water quality of various drains and finally the water quality of the rivers have been analyzed and tabulated.

7.2 Based on this information, the State Pollution Control Board organized several meetings and seminars with the members of the industries and other stakeholders, namely: the Municipal Corporations and Urban Development and Housing Authorities.

7.3 In terms of the objectives of the Study, a JIPM plan has been developed where the main focus is to motivate the polluters to take the necessary pollution abatement measures through a self-regulatory mechanism. The Board in consultation with the stakeholders has prepared an Action Plan for speedy implementation of the pollution abatement measures by both the industries and the local authorities.

8.0 Observations Emerging from the Field Visit

8.1 The project area was inspected on 17.06.2004. Two of the four estates viz. Baddi-Barotiwala and Parwanoo were inspected. Officials of HPSTEPPCB were present during the inspection.

8.2 Drains carrying combined wastewater were inspected. Discussions were held with members of the team involved in the study. Earlier on 16.06.2004, a meeting was held with the Member Secretary, State Pollution Control Board at Shimla, where the Principal Investigator of the project team was also present.

8.3 The following observations emerged from the site visit and discussions with the Board officials:

- (i) There are three main sources of water pollution in the industrial estates covered under this Study, namely; Industries, Municipal Bodies and Housing Authorities.
- (ii) According to HPSTEPPCB, almost all the industries have set up effluent treatment plants (ETP). However, several ETPs need to be upgraded. Inspection of the drains carrying mixed effluents at Baddi-Barotiwala presented a rather dismal picture. The colour as well as odor of the effluents flowing in drains raised a question mark over the claim that only treated industrial effluents are discharged into the drains. The officials of the State Pollution Control Board tried to explain that it is the colour only in the effluents which gave a bad look otherwise the quality was in accordance with the prescribed discharge standards. However, there was no way to cross check this statement.



A Drain carrying Polluted Water

Another Polluted Drain



- (iii) The second category of pollution which is considerably larger in quantity than the industrial effluents is the domestic sewage from the residential areas. There is no sewage treatment plant in any of the four industrial estates. The septic tanks provided for sewage treatment are non-functional and as such untreated sewage overflows from these tanks into the drains. State Government or the Housing Authorities have no funds for either upgrading the septic tanks or putting up proper sewage treatment plants. The State Pollution Control Board informed that at Baddi-Barotiwala, the Housing Board has constructed 500 houses and is presently in the process of constructing another 250 houses. But there is no plan for constructing septic tanks or sewage treatment plants for the additional pollution generated from these houses. Under the circumstances, there seems to be no possibility of any remedial measure to address this source of pollution.
- (iv) The third category of pollution is the municipal solid waste generated in the towns which is often dumped into the open drains. The local bodies in these four estates are cash starved and have hardly shown any concern to address the problem.

9.0 Recommendations

9.1 The State Board has prepared an excellent State of Environment Report in respect of the four industrial estates. However, its implementation would depend on the financial resources and the political will of the State Government. Past experience indicates that local bodies are always cash starved and that handling and treating of sewage gets the last priority.

9.2 The Ministry of Environment and Forests (MoEF) through the Central Pollution Control Board (CPCB) regularly monitors the pollution of rivers and lakes. The action plan prepared by the HPSTEPPCB may be forwarded to CPCB for ensuring its compliance.

9.3 MoEF has issued a Notification under Environment (Protection) Act 1986 on 7 July 2004 under which environment clearance is mandatory for all new construction projects which generate a minimum 50000 litres of wastewater per day. This was a much-desired instrument needed to check pollution generated from new townships. All new construction activities should be governed by this legislation.

9.4 Intervention of MoEF is necessary to check pollution from municipal solid waste under MSW (Management and Handling) Rules 2000.

9.5 States are always facing resource crunch to take up construction of capital intensive sewage treatment plants on their own. MoEF, under its massive scheme of the National River Conservation Plan (NRCP), funds such projects. Works under NRCP are in progress in 18 States covering all major rivers of the country. However, Himachal Pradesh does not appear on the NRCP map. MoEF may consider including some of the important works identified in these four industrial estates under NRCP.

9.6 The State Government and HPSTEPPCB need to closely monitor the pollution generated from the industry so that at least this source can be addressed immediately and effectively.

**Evaluation Report
on
Participatory Sustainable Land and Water Use Management in Macro-watershed
Kothun, Chaksu Block, District Jaipur, Rajasthan**

Date of Visit: 28-29 June 2004

1.0 Background

1.1 The Project Area is located at village Kothun, 10 kms from the block town of Chaksu and about 50 kms from Jaipur on the Jaipur-Tonk National Highway. It is part of the Macro-watershed, Sanwalia and is designated as micro-watershed No. 8 Khawada. The area lies along the latitude of 26° 55' north and longitude of 75° 49' east.

1.2 The population of Kothun village, where the works have been executed, is 2430, comprising 288 households. The ratio of male to female is 50.5:49.5. The population of SC/ST is 135, which is 5.5% of the total population. The average literacy level is about 45%. Only 16% of women are literate. The main profession of the people is agriculture and agricultural labour.

1.3 Average annual rainfall in the area is about 500 mm. The total cultivable area in the village is 1350 ha. Of this, 124 ha. is irrigated by wells, 953 ha. is culturable waste land and 133 ha. is not available for cultivation. Irrigation is largely dependent on rains as in the absence of proper monsoon, wells go dry. In this scenario, semi-desert conditions prevail all over the area due to frequent occurrences of droughts. Farmers look for alternative sources of water such as rainwater harvesting for agriculture.

2.0 Scope of Project

2.1 With a view to mitigating the problems of the farmers, the Indian Institute of Rural Management (IIRM), Jaipur prepared a proposal of micro-watershed management in village Kothun for consideration under the SGF programme of UNDP.

2.2 The proposal submitted by IIRM comprised the following components:

	Item	Quantity
(i)	Big Size Anicut	1
(ii)	Drop Spillways	17
(iii)	Training, Education and Public Awareness	

3.0 Project Objectives

The main objectives envisaged in the programme were:

- (i) Recharging of groundwater aquifer through rainwater harvesting;
- (ii) To increase water table in the surrounding wells, where it has been falling at an alarming rate;

- (iii) To increase area under irrigated crop; and
- (iv) To check erosion of fertile land.

4.0 About the NGO

4.1 IIRM is a reputed Business Management Institute located at Jaipur. The Institute is run by an NGO, the IIRM Society. The Institute came into existence in 1988. Starting with a humble beginning with some research and consultancy projects, the Institute has grown today into a centre of excellence in management education.



A view of IIRM Jaipur

4.2 The Institute has an independent NGO wing which deals in rural development activities. The wing has various centres which are headed by subject experts and work independently. The NGO wing is presently implementing two major operational projects, one of watershed management in 15 districts of Rajasthan and the other of drinking water management project funded by the KFW, Germany.

4.3 The Centre for Natural Resource Management (CNRM) is an independent division of the NGO wing responsible for watershed management programme. The Centre is headed by a Director, Mr. V.K. Bagda, who retired from the Government of Rajasthan as Director, Agriculture. The activities covered by CNRM in the past include:

- (i) Watershed development programme in 48 micro-watersheds;
- (ii) District Poverty Initiatives Project (DPIP) in Tonk district;
- (iii) Training and Evaluation;
- (iv) Total Sanitation Campaign in Sikar, Rajasthan; and
- (v) Agriculture Extension Work under a World Bank Project in Sriganganagar district.

4.4 The annual budget of the CNRM is about Rs. 1 crore. This SGF project has been executed by CNRM under the supervision of its Director, Mr. V.K. Bagda.

5.0 Criteria for Selection of Project

5.1 The CNRM has been implementing DPIP of the Government of Rajasthan in Tonk district. The project is funded by the World Bank. It was during the implementation of this project that the CNRM came across the problems of water shortage facing the Kothun village. The area suffers from frequent droughts resulting in poor agricultural yield from whatever little cultivable land the villagers have. The village has a vast area of wasteland, which remains uncultivated due to acute shortage of water.

5.2 During the implementation of the DPIP, the NGO was approached by the villagers for help in managing large quantities of rainwater runoff from the watershed in a sustainable manner. The contours of the area facilitate the runoff flow down quickly without helping much in recharging groundwater. On the other hand, rainwater runoff adds to the problem of erosion of fertile agricultural soil. According to the NGO, the villagers have the full knowledge of the problem as also its solution but are helpless to address the issues due to shortage of financial resources.

5.3 It was in this background that this project was picked up by IIRM on the request of community. The project aimed at harvesting part of the rainwater runoff and provision of spillways and contour bunding to check soil erosion.

5.4 The project was thus site specific and demand driven.

6.0 Project Cost

The estimated cost of the project approved by WAPCOS was Rs.15.44 lakhs. The shares of SGF, beneficiary and the NGO were envisaged as under:

	Share (in Rs. lakhs)
SGF	11.89 (77%)
Beneficiary	1.19 (08%)
NGO	2.36 (15%)
Total	15.44

7.0 Project Execution

7.1 The project was approved on 4.10.2002. However, the implementation work was started on 15.9.2002. The project duration was envisaged as 12 months. The NGO informed that the project was completed on 15.2.2004, about five months behind, mainly on account of non-availability of labour due to their preoccupation with the sowing of crop.

7.2 The major works executed under the project include an anicut of 31.5 meter length and 2.5 m height constructed at a cost of Rs.6.84 lakhs and 17 drop spillways at a cost of Rs.4.61 lakhs. The sites of the anicut and spillways were selected in consultation with the members of the community and after surveying the area.



A View of the anicut

A Recharged Well



7.3 Under normal conditions, the anicut can store nearly 1 lakh m³ of rainwater runoff which will help in recharging the wells in the surrounding area.

7.4 Drop spillways will help increasing the productivity of land and checking soil erosion. With the construction of these structures, it will be possible for the farmers to construct earthen bunds in their fields for *in situ* retention of rainwater.

7.5 The villagers have converted their ideas into an innovation by way of constructing a ramp-cum-waste weir in a road cum drain area to collect rainwater runoff. This low cost option has been tried in a carriageway for bullock carts which becomes a drain during monsoon. It serves a dual purpose, one, it helps storing rainwater and ground water recharge and two, it prevents soil erosion in the carriageway.

7.6 In addition, five group meetings of the villagers and slogan writings on walls formed part of the education and awareness programme. An amount of Rs.0.22 lakhs has been spent on this activity. Training of beneficiaries in various aspects of watershed management was an integral part of the project. Training material and literature were prepared on watershed management and distributed amongst the beneficiaries. An amount of Rs.1.08 lakhs was incurred on training.

8.0 Expenditure

8.1 The total expenditure incurred on the project is reported as Rs.16.19 lakhs against the approved cost of Rs.15.44 lakhs. The NGO informed that the excess expenditure of

Rs.0.75 lakhs was due to additional administrative cost during the extended period of five months.

8.2 The details of activity-wise project expenditure are as under:

Item	Quantity	Expenditure (in Rs. lakhs)
(i) Anicut	1	6.84
(ii) Drop Spillways	17	4.61
(iii) Survey and DPR Preparation	LS	0.65
(iv) Education and Awareness	LS	0.22
(v) Training		1.08
(vi) Overheads of NGO		2.79
Total		16.19

8.3 The NGO informed that they have requested WAPCOS to approve the additional cost of Rs.0.75 lakhs which was due to unavoidable reasons.

9.0 Community Participation

9.1 Participation of community was the cardinal point of the project. The NGO fully relied on the information and knowledge of the villagers and designed the project accordingly. A committee consisting of five important members of the village was constituted by the community itself for implementation of the project and collection of contribution from beneficiaries.

9.2 The physical implementation of the project was carried out by the community, while the IIRM played the role of facilitator only in preparing the plans and estimates. The sites for construction of structures were selected by the implementation committee.

9.3 The construction of a ramp-cum-weir in a cart carriageway is an innovative contribution of the community and only indicates that the villagers do understand the problem as much as any watershed management expert would do.

9.4 The construction activities generated short-term employment for the members of the community. All the labour and masons were picked from the same area. The NGO informed that the project provided 1600 man-days of skilled labour and 4300 man-days of unskilled labour during its implementation. Inputs in terms of labour and materials from the villagers were adjusted against their contribution in the project.

9.5 Implementation of this project has imparted a fairly high level of confidence amongst the community which can now implement such projects on its own. The project has, thus, helped in the capacity enhancement of the villagers.

10.0 Beneficiaries Covered

10.1 Seventy-nine farmers have been directly benefited from the project. The drop spillways have benefited 17 farmers, whereas the anicut has helped 52 farmers by way of

recharging of their wells. The increased availability of well water helped the farmers irrigating their fields adequately during the very first year of the project.

10.2 According to the NGO, the project has been able to service about 30% of the cultivable land in the village.

10.3 Going by the nature of the project, it was not possible to focus on the women and SC/ST groups.

11.0 Education and Awareness

11.1 The NGO organized five awareness camps during the initial period of project implementation which were well attended by the members of the village community. In these camps, detailed discussions were held on such issues as site selection for structures, construction activities involved and the benefits accruing to the community from the project.

11.2 Slogan-writing on walls and on small boards specially put up in the project area for this purpose was another activity taken up to make the farmers aware of the project.

11.3 Training programmes on construction methods and procedures for masons and labours and better rainwater management practices for farmers were arranged. Discussions on issues like crop rotation, crop diversification and dry farming practices were arranged, which helped the farmers to cultivate their land across the slopes during monsoon and thereby increasing the productivity.

11.4 Group discussions on land reclamation, agro-horticulture and silvi-pasture were arranged during the training programme.

11.5 Farmers were taken to the IIRM College of Engineering and Technology at Phagi, where they were given exposure on vermi culture and Nadeep type compost pits.

12.0 Institutional Arrangements

12.1 The Project Management Committee constituted during the implementation of the project continues to look after the assets and post implementation maintenance. The committee consists of five elder members of the village under Shri Hanuman Choudhary.

12.2 No other committee or self-help groups exist in the village.

13.0 Observations Emerging from the Field Visit

13.1 The project area was inspected on 28-29 June 2004. Shri V.K.Bagda Director, CNRM, Chairman of the project implementation committee and some of the beneficiaries were present during the inspection.

13.2 The anicut, most of the drop spillways, recharged wells, and the ramp-cum-weir were inspected. The observations emerging from the inspection are summarized below:



A drop Spillway

A Weir-cum-Ramp in the Cart



13.3 At the time of visit, there was no water in the upstream reservoir of the anicut. However, Shri Hanuman Choudhary informed that the reservoir became nearly full during the very first monsoon after completion of the dam. This helped in the recharging of 52 wells in the command area of the anicut in a significant manner.

13.4 With more volume of water available in the wells, farmers were able to irrigate at least 30 to 40% extra land which increased their agricultural income.

13.5 Construction of spillways and farm bunding has helped the farmers in retaining rainwater upstream of the structure. Deposition of silt (coming with runoff) could be seen in the fields upstream of the spillway which indicates the extent to which the farmers have been benefited from these facilities.

13.6 The villagers informed that the area suffered on account of droughts during the past four years. Despite the fact that during the last monsoon, the rainfall was below normal, the water table in the surrounding area has risen from 1' to 2'. This is confirmed by the data collected by the NGO on the water levels in the 52 wells for the pre and post monsoon periods. These data have been furnished in the completion report.

13.7 The beneficiaries informed that irrigation of additional land by the harvested water has increased their agricultural income significantly.

13.8 The construction of a ramp-cum-weir in the cart carriageway is a novel idea coming from none other than the villagers themselves. This is an indicator of the capacity enhancement of the village community.

13.9 Seeing the results of this project, not only the members of Kothun village but also those from other villages of the same Panchayat were strongly pleading for more similar structures in the area. The Kothun village community pleaded that this project has serviced only about 30% of their area and, therefore, financial assistance to cater to the remaining 70% is necessary. They have identified another site for a second anicut which can harvest at least 10 times more water than the present one.

13.10 The height of the existing anicut may also be increased by at least 1 meter to increase its capacity significantly.

13.11 Nearly 40 villagers from the nine nearby villages met the team during inspection. There are nearly 855 wells in these villages most of which become dry during summer months adversely affecting the agriculture potential. All of them strongly pleaded for a similar anicut of 50 m length x 2.5 m height and construction of about 50 spillways which would recharge more than 400 wells in the area. This would enhance their agricultural income and the economic prosperity of the area as a whole. They insisted on the NGO to submit a proposal to the UNDP for replication of the project. The IIRM has estimated the cost of the project at Rs.39 lakhs. A copy of the request letter from the IIRM is attached to this report.

13.12 One of the spillways was found to be damaged as a result of soil erosion. The Project Committee was advised to repair it before the next monsoon.

श्री २ लाल वर्मा

कालू लाल वर्मा

दलमान

श्रीमद्वाग्वरणीक

श्री २ लाल वर्मा जी

रामकिशोर लाल

मुकेश

कालू लाल वर्मा

कालू लाल वर्मा

Gajendra

श्री २ लाल वर्मा जी

श्रीमद्वाग्वरणीक

श्रीमद्वाग्वरणीक

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श्रीमद्वाग्वरणीक

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श्री २ लाल वर्मा जी

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**Evaluation Report
on
Sustainable Management of Wetlands in Dharbhanga, North Bihar**

Date of Visit: 2.7.2004

1.0 Background

1.1 The entire North Bihar is a bowl shaped land. Regular floods in the Kamla, Kosi and Balan and other small rivers leave the region submerged for 8-9 months in a year. Excavation of ponds in the region for socio-economic purposes is a common practice. Flood conditions have converted a large part of the land area into wetlands.

1.2 This project aims at a comprehensive study of the management practice of freshwater wetlands in North Bihar with reference to Makhana (botanical name: *Euryala ferox*) cultivation. Makhana is a dry fruit used in several forms in Indian homes. Some of the common uses of this fruit are making curry and sweet pudding with milk etc. It is also used for religious purposes during worships in temples and during marriage ceremonies.

1.3 Makhana is grown in 9 districts of North Bihar. These are Darbhanga, Madhubani, Saharsa, Supaul, Madhepura, Kishanganj, Araria, Purnia and Katihar. Of these, it is prominently cultivated in Darbhanga and Madhubani districts. In Darbhanga district alone, which forms the study area, there are nearly 1500 wetlands where Makhana is grown extensively. This study has been undertaken in three ponds about 40 kms north of Darbhanga town.

1.4 Makhana cultivation is done by the fishing community called Mallah. The community has a population of about 3 lakhs in the district. All belong to SC/ST category and are part of the 6-7 lakh population of below poverty line group. Unscientific agricultural practice resulting in lower yield, lack of knowledge in protecting the crop from pests and exploitation of farmers by middlemen are some of the reasons for the prevailing poor economic conditions of the community.

1.5 It was for these reasons that this Study was commissioned under the SGF project of UNDP.

2.0 Scope of Study

2.1 The Mithila Samajik Evam Arthik Vikas Sansthan (MSEAVS), a Darbhanga based NGO, was assigned the Study based on their proposal submitted for approval under the SGF project.

2.2 The Terms of Reference (TOR) of the study focuses on developing strategies for sustainable management of Makhana cultivation in North Bihar with a view to improving the economic conditions of the Mallah community.

2.3 The scope of work to be covered under the study was:

- (i) To select a series of water bodies in a representative area and study the existing practice in detail;
- (ii) To use participatory methods in the survey to maximize the community's participation;
- (iii) To carry out literature survey for gaining information on augmenting the yield of Makhana in a sustainable manner;
- (iv) To identify indigenous promising varieties of Makhana and to evaluate their nutritional values;
- (v) To identify systematic diseases at the seed stage and remedial measures for crop protection;
- (vi) To study morphology of plants grown in primitive and modern conditions and to pick up best varieties suited for the area for higher yields and disease resistant quality;
- (vi) To analyze the pond water quality at pre and post harvest stage for gaining information on the potential of water pollution by the crop;
- (vii) To conduct trials on seeds to get a spectrum of mutants to find out plants with smaller petioles so that it may be cultivated in shallow waters; and
- (viii) To suggest modern methods of agriculture for improving yield.

3.0 About the NGO

3.1 The Society has an eminent scientist, Prof. (Dr.) S.S.N. Sinha as its Head in the capacity of Director General. Prof. Sinha is an M.Sc. Ph.D (London) and F.L.S (London). He retired as University Professor in Botany and HOD Bihar University, Muzaffarpur. Out of his total 40 years' experience, he spent 35 years in research work. He has contributed 35 papers in foreign journals and over 100 papers in Indian journals. Prof. Sinha has done extensive research on Makhana cultivation.

3.2 MSEAVS acts in collaboration Shekher Seva Sansthan and Hardeva Anusuaia Trust both located at Darbhanga. The NGO is engaged in various activities aimed at improving the living conditions of the weaker sections of society. A number of scientists, most of them on part time basis, support Prof. Sinha in different projects implemented by the Society.

3.3 In the Study under reference, Prof. Sinha has been assisted by Dr. Vidyanath Jha, Shri Navin Jha and Dr. Dharendra Kaushal.

4.0 Criteria for Selection of Project

4.1 Wetlands are important eco-systems and have great economic values. They provide multifarious benefits to the society. Wetlands help in groundwater recharge, serve as pollution sink and thereby improving the water quality, provide flood barriers and support the community economically. More importantly, wetlands serve as a habitat for biodiversity. Therefore, sustainable management of these eco-systems is important from the point of view of environment protection.

4.2 The wetlands of North Bihar are under threat due to unscientific agricultural and management practices used in economically exploiting these eco-systems by the

stakeholders. This has resulted in low yield and inferior quality of Makhana, which is extensively grown in these wetlands. Unless remedial steps are taken to address the problems, Makhana cultivation is likely to disappear soon.

4.3 Considering the potential of Makhana cultivation in North Bihar and to promote its farming in a scientific manner, the Indian Council of Agricultural Research has started a Makhana Research Institute at Darbhanga in 1999. However, the Institute is yet to start functioning. Therefore, there was need to take up this study to develop strategies towards mitigating the problems of Makhana cultivators. An eminent scientist, Prof. J.S. Singh, FNA from the Banaras Hindu University motivated the NGO to take up this study in the interest of the Mallah community of North Bihar. The members of the community and other stakeholders also approached the NGO for help.

4.4 It was in this background that this study area was selected.

5.0 Project Cost

An amount of Rs.3 lakhs was approved in August 2000 for completing the study. The expenditure was proposed mainly on items like travel, hiring of three ponds, manpower for the study, report preparation and workshop for dissemination of findings. The study was to be completed in 12 months.

6.0 Makhana Processing

6.1 Cultivation and processing of Makhana is a complex activity. The crop cycle starts with the sowing and germination of seeds from November to January. Around February and March, leaves start growing on the water surface. Around this period only, the leaves face attack of a blight which causes spots on its surface. Farmers use local crude methods to save the crop from such attacks. Plants start flowering and fruiting during April to June. Two types of flowers are produced, one, which remains above the water surface (called chasmogamous) and the other which remains under water (called cleistogamous). Both types of seeds are reported to be equally fertile. In July-August, fruits start bursting on maturity to produce seeds. Seeds float on the water surface and then sink to the bottom of the pond. A healthy plant produces 15-20 fruits, which in turn produce 400-500 seeds. Collection of seeds from the bottom of the pond is a difficult and skilled job which is performed by the Mallah community. It is also a health hazard, as the Mallah has to dive and remain under polluted pond water for 3-4 minutes.

6.2 The next step is to process the raw Makhana seeds, which is a laborious and time-consuming activity. Seeds are first washed and cleaned and then sun dried. Dried seeds are stored for a small period at ambient conditions. During storage, water is sprinkled to keep the seeds fresh. The seeds are sun dried again before popping. The popping process involves roasting, tempering and popping. Popped seeds are hit by a mallet carefully to separate the Makhana from the shell.



A view of the Makhana Pond

Makhana Seeds



6.3 After segregating and grading, the Makhana fruits are packed in gunny bags for marketing.

7.0 Execution of Study

7.1 The work was started in November 2000 and was to be completed in 12 months. However, it took 15 months for the NGO to conclude the study. The delay was for accommodating seasonal requirements.

7.2 The expenditure of Rs.3 lakhs has been incurred on the following activities:

Item	Expenditure (in Rs.)
(i) Travel cost to project sites	71000
(ii) Hiring of 3 ponds for experiments	30000
(iii) Purchase of Research Material and Survey Work	15000
(iv) Labour cost and Sundry Expenses	10000
(v) Salary of Scientific Staff	132000
(vi) Workshop Expenses	20000
(vii) Report Preparation	22000
Total	300000

8.0 Community Participation

Makhana farmers across the district were aware of the study and cooperated with the NGO. Survey and data collection was done through their support only. Through the workshop and field visits, the community was educated as to how they can switch over to a better practice to increase their farm income.

9.0 Findings of the Study

9.1 The Study was conducted in the ponds of Benipur Sub-division of the district about 40 kms away from Darbhanga.

9.2 A visit to Guwahati and Deepar Beel in Tripura where Makhana is grown was undertaken in November 2000.

9.3 Literature survey was carried out for Makhana cultivation in North Bihar and lower Assam.

9.4 Makhana provides a means of sustainable development of the Mallah community of North Bihar. It has a significant bearing on the regional economy. However, in the present system, the ponds are settled in the names of influential middlemen and the Mallah community works as labour only. As such, the community continues to remain as a deprived class.

9.5 The Mallah community has developed a near monopoly in the seed collection and processing, which is laborious, intricate and hazardous. The processing of Makhana in the Lower Assam area is done by the North Bihar labour only.

9.6 Nearly 90 % of the Makhana cultivation is done in derelict and abandoned polluted ponds. Falling of Makhana plant leaves on the water surface and their decaying process results in decreasing the dissolved oxygen in the pond water to nearly zero. As such only air breathing fish can survive in such waters.

9.7 Physico-chemical characteristics of water and soil in Makhana ponds did not cover DO, BOD and COD analysis without which, the pollution level in ponds cannot be assessed.

9.8 Seeds from different parts of North Bihar and Assam were collected and analyzed. The results indicate that Katihar (in Bihar) seeds have the highest germination rate followed by Guwahati and Darbhanga.

9.9 For Makhana cultivation, about 1 metre deep pond is ideally suited. Crop rotation (Makhana with potato or wheat) and integrated aquaculture of Makhana with fish is possible by modifying the agronomic practices. This can significantly increase the income level of farmers.

9.10 Makhana pops are very light in weight. Freight charged by railways for transportation is on volume and not by weight. This affects the income of farmers.

9.11 Fungal tumors, algal blooms, aquatic weeds and insects and loss of water table during summer are growth constraints resulting in loss of crops.

9.12 Makhana contains 10-12% protein and 79% carbohydrates and amino acids which makes it superior to most plant based diets.

9.13 At present about 470 ha. of land is under Makhana cultivation in Dharbhanga which can be increased to 5000 ha. with adequate scientific and financial support.

9.14 Focus of the Department of Agriculture to promote Makhana cultivation in the State is not visible.

9.15 Farmers have developed the implements used in Makhana cultivation from locally available materials.

10.0 Education and Awareness

10.1 As part of the TOR, the NGO organized a two-day Seminar on the subject on 21-22 July 2002. The Seminar was attended by nearly 270 persons comprising scientists, Gram Pradhans, stakeholders, progressive farmers, students and government officials.

10.2 A number of scientific papers were presented. A cursory look at the abstracts of these papers indicates that the Seminar was more of a science event where the subject of Wetlands was discussed in a broader perspective. However, it would have been better if the Seminar had specifically focussed on the subject of the Study and the interaction was in the stakeholders' language.

10.3 The NGO should also have published the recommendations of the Seminar for future action.

10.4 The NGO, however, created awareness on the work that was assigned to them amongst the Mallah community and other stakeholders during their interaction with the community and field visits.

11.0 Observations Emerging from the Field Visit

11.1 The project area was inspected on 2.7.2004. Prof. (Dr.) Sinha and his other scientists were present during the inspection. About 4-5 Makhana ponds around Darbhanga were inspected. Interaction was done with the pond owners/farmers and members of the Mallah community.

11.2 The community members were well aware of the work that was being done by the NGO. They are, however, looking for technical and financial assistance from government sources, which can help increasing their economic condition.

11.3 The staff employed on the study appeared to be very knowledgeable persons on the subject. Particularly, Prof. Sinha is one of the leading experts on the Makhana cultivation. The NGO has gathered a lot of data and information on the subject as covered in the TOR. However, the findings of the study should have been presented in

the form of an action plan to achieve the set objectives. The NGO informed that due to limitation of funds, they could not complete this work.



A Mallah taking out a Makhana Plant from

Members of Community with NGO



11.4 Nevertheless, the database generated by the Study should be used to approach the State Government to give priority to this unique cultivation. Primarily, it is the responsibility of the State to appreciate the problems facing the Makhana farmers, which is unique to the State and provide the necessary technical and financial support for sustainable management of this species.

11.5 The report does not address the health impacts on the Mallah community, which works in the polluted water of ponds.

11.6 During the discussions with the NGO, the following action plan was evolved based on the findings of the Study. A copy of the action plan is attached to this report. The Ministry of Environment and Forests may like to forward this plan to the Government of Bihar for implementation.

- (i) The coverage of Makhana plantation could be extended through proper soil amendments to the unused water pockets which are at present lying as wasteland.
- (ii) For easy operation and a healthy Makhana crop, its cultivation should be promoted in knee deep water only.

- (iii) Integrated aquaculture by thinning out the plants in the middle of the pond may be tried to increase the income of farmers. This would allow water to retain more dissolved oxygen which can sustain carp and other conventional catfishes.
- (iv) Relatively less deep fields used for arable crops could also be utilized for Makhana cultivation by making arrangements for assured supply of water. This can increase the income of farmers by 30% from the same area.
- (v) Education and awareness programmes are needed to encourage the use of pesticides on seeds to protect them from pests.
- (vi) Packing of Makhana in polylined jute bags can protect the pops for a longer period from insects and moisture.
- (vii) Farmers have to work for long hours in cold and dirty water which may affect their pulmonary system and cause skin infection. This needs to be looked into by the state government for taking necessary health protection measures.
- (viii) The marginal Makhana farmers suffer from exploitation from the middlemen. Financial assistance needs to be extended to them at cheaper rates.

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Date: ~~03-07-2004~~

After discussions with Sri R. P. Sharma, UNDP Consultant, the following suggestions are being submitted to the UNDP for implementation through suitable agencies for better and healthy management of Makhana crop-

- (1) The coverage of Makhana plantation could be extended to the unused water pockets, which are at present lying as wasteland, through proper soil amendments.
- (2) During our field work we could identify areas which have knee-dip water. Technique evolved by us could give healthy Makhana crop under that depth of water. If the crop is cultivated in knee-dip water, the collection of seeds would be much easier and the percentage of seed wastage due to sinking in mud would be far less than in the conventional method applied.
- (3) We have successfully done the integrated aquaculture by thinning out the plants in the middle of the pond. This allows water to retain sufficient dissolved oxygen which sustains carp fishes along with the conventional catfishes.
- (4) Relatively less deep plots which are being used for arable crops could also be utilized for Makhana cultivation after making arrangements for assured supply of water. This has been successfully done in the present case with approximately 30% increase in the farmers income from the same area of the plot.
- (5) The use of pesticides on the collected seeds protects them from the attack of pests. It has been successfully done during the present work.

- (6) A thin layer of polythene inside the jute bag protects the pops for a longer period from insects and moisture.
- (7) Makhana growers have to work for long hours in cold and dirty water which affects their pulmonary system and causes skin infections. Suitable health insurance of the workers could prove to be a step in the right direction.
- (8) The low water level in the Makhana ponds during the hot summer months makes a heavy loss to its yield. The crop also suffers a heavy damage due to the attack of insects and other pests. Hence there is a need of crop insurance also.
- (9) The marginal Makhana farmers suffer from the exploitation of the middle men. There is a need to extend financial assistance to them at cheaper rates. All attempts have to be made to make the processes of harvest and pop making less cumbersome.

Shashi Shekhar N. Sinha
Shashi Shekhar N. Sinha 2/7/04
Director General
Mithila Samajik Evam Arthik Vikas Sansthan.

**Evaluation Report
on
Popularization of Rainwater Harvesting through construction of Low Cost Ferro-
Cement Tanks for Drinking Water Supply
and
Environment Preservation and Development of Sanitation Facilities through
construction of Low Cost Sanitary Latrines in Ernakulam District**

Date of Visit: 5-6 July 2004

1.0 Background

1.1 The project has been implemented in three Panchayats of the Angamali Block in the Ernakulam district. The Panchayats are Ayyampuzha, Karukutty and Malayattoor. The project areas are located about 20 to 30 kms north and north east of the Angamali Municipal town and lie between the latitudes of 9° 42' to 10° 18' north and 76° 12' to 76° 46' east. All the three Panchayats form part of a steep, hilly and rocky terrain which makes the area difficult to exploit underground water resources like digging of bore wells.

1.2 The total population of the three Panchayats is 63738. The details of males and females and SC/ST population are as under:

Sl. No.	Panchayats	Population			SC		
		Male	Female	Total	Male	Female	Total
1	Ayyampuzha	8002 (51%)	7618 (49%)	15620	904	846	1750 (11%)
2	Karukutty	12311 (49%)	12629 (51%)	24860	1066	1018	2083 (8%)
3	Malayattoor	11711 (50%)	11547 (50%)	23256	1056	1084	2140 (9%)

1.3 The literacy level is over 90%. About 80% of the population is below poverty line. Agriculture and rubber tapping are the main professions of the people of the area.

1.4 Kerala is one of the States which have a very high rainfall. The State receives two monsoons. The southwest monsoon starts from June and continues up to September. This is followed by the northeast monsoon, which continues up to November. The project area has an average rainfall of about 2800-mm. However, as the area is a steep hilly terrain, it takes only 48 hours for the entire rainwater runoff to flow down the Arabian Sea leaving hardly any scope for water harvesting or conservation. Despite a long and heavy monsoon, the area suffers from acute water shortage from February to May, when most of the wells become dry. The Ayyampuzha Panchayat with a population of over 15000 has only 7 wells and is therefore, the worst sufferer. The number of wells in the other two Panchayats are also far too less to meet the drinking water requirements of the area. During the summer months, women of these Panchayats have to travel 3 to 4 kms. daily to fetch drinking water.

1.5 Non-availability of sanitary latrines is another problem facing the project area. The NGO informed that about 30% of the population, mostly falling under BPL, do not have toilets in their houses and go for defecation in the open. This is a health hazard.

1.6 In this background there has been a constant demand by the community for toilets and rainwater harvesting measures.

2.0 Scope of Project

2.1 With a view to addressing the above problems the Andhyodaya, an NGO based at Angamali in Ernakulam district prepared the following two separate proposals for consideration under the SGF Programme of UNDP.

- (i) Popularization of rainwater harvesting through construction of low cost ferro-cement tanks for drinking water supply; and
- (ii) Environment preservation and development of sanitation facilities through construction of low cost sanitary latrines.

2.2 The proposals comprised the following components:

	Item	Quantity
A.	Rainwater Harvesting	
(i)	Rainwater Harvesting Tanks	60
(ii)	Awareness Camps	5
B.	Sanitation	
(i)	Low Cost Toilets	50
(ii)	Vermi-Compost Pits	75
(iii)	Awareness Camps	2

2.3 While the rainwater harvesting works were proposed in all the three Panchayats, the sanitation works were to be taken up in the Malayattoor Panchayat only, where very few toilets existed.

3.0 Project Objectives

The main objectives of the projects were:

- (i) Construction of rainwater harvesting structures and low cost toilets;
- (ii) Provision of portable vermin compost pits;
- (iii) Creation of awareness amongst the community on these technologies; and
- (iv) Community participation in the project.

4.0 About the NGO

4.1 Andhyodaya is a popular NGO of Kerala State and is based at Angamali in the Ernakulam district. They started their operation in 1990 with a vision to formulate and implement development projects and programme in the rural areas. The NGO has constituted self-help groups (SHGs) at the grass-root level in each ward of the Panchayat, which ensures their direct contact with the community on a day to day basis. This also helps in understanding and appreciating the problems of the community and finding solutions of such problems with their active participation. This ensures sustainability of the development projects they are taking up for the benefit of the community.



Andhyodaya Head Quarters, Angamaly

FC Tank in a School Building, Thabore



4.2 The main thrust areas of work of the Andhyodaya are water conservation, sanitation, popularization of use of solar energy and farmers' development programmes. On the basis of their performance, the Kerala Water Authority (KWA) has selected the NGO for implementing the VERSHA programme of rainwater harvesting in three problem districts of Kerala. The project involves construction of 1500 ferro-cement tanks at an estimated cost of Rs.2.5 crore. The NGO has also implemented a sanitation project supported by CAPART in Lakshadweep. Under a World Bank assisted programme, the Andhyodaya has implemented a Solar Energy Programme comprising 75 solar water pumps, 125 street lights, 11000 solar lanterns and 2 lakh litres per day of water heating systems. The Ministry of Non-conventional Energy Sources has selected the NGO as one

of their authorized solar energy equipment shops. The NGO implemented projects amounting to Rs.3.10 crore during 2003-04.

4.3 The NGO has a regular staff of 20 in their Angamali office which is located in an impressive building. The works are overseen by a full-fledged Board of Directors. Mr. Peter Thettayil is the Executive Director, under whose supervision the SGF project has been implemented. The activities of the NGO can be browsed at their website: www.theandhyodaya.org

5.0 Criteria for Selection of Project

5.1 The NGO through their grass-root units of Gramodaya was in the full knowledge of drudgery faced by the community on account of shortage of water and sanitation facilities in the three Panchayats. Water Resource Committees with representation of the community from each ward and members of the Gramodaya were constituted to analyze the problem and evolving sustainable solution. Thus, the participation of the community was ensured from the conceptual stage of the project.

5.2 The Water Resource Committees developed criteria for selecting the beneficiaries in an objective manner under both the projects. Preference was given to the following categories of beneficiaries:

- | | |
|-----------------------------|--|
| (i) Persons falling BPL | (ii) Persons having no access to water |
| (iii) Widows | (iv) Families having many girl children |
| (v) Persons belonging to SC | (vi) Persons willing to contribute 25% of cost |

5.3 Thus, both the projects were demand driven.

6.0 Project Cost

The approved cost of the rainwater-harvesting project was Rs.17.48 lakhs and that of the sanitation project Rs.3.42 lakhs. SGF assistance to the projects was envisaged as Rs.12.65 lakhs (72.5%) and Rs.2.62 lakhs (76.5%) respectively. The balance cost was to be met through the contributions from the beneficiaries and the NGO.

7.0 Project Execution

7.1 The rainwater-harvesting project was executed in three phases. A uniform design of 10000-litre capacity has been adopted for all the places.

7.2 The first phase was started on 20 September 2002 in the Ayyampuzha Panchayat and was completed in just 4 months on 20 December. A total of 23 tanks have been constructed in this Panchayat.

7.3 Under the second phase, the work of construction of 19 tanks was taken up in the Malayattoor Panchayat from 20 December 2002 onwards. This phase was completed in about 3 months time by 31 March 2003.

7.4 The third and the final phase was started on 1 April 2003 for construction of 18 tanks in the Karukutty Panchayat and was completed in 4 months on 31 July 2003.

7.5 Thus, the entire construction work was carried out in an organized manner in just 10 months against the target period of 12 months. The average cost of construction of ferro-cement tanks was reported as Rs.2.50 per litre, which is considered quite reasonable.

7.6 As the community was exposed to the rainwater-harvesting programme for the first time, there were several reservations and inhibitions in their minds about the effectiveness and sustainability of the ferro-cement tanks for harvesting rainwater. This was overcome through an extensive education and awareness programme organized by the NGO. Five camps were organized in the three Panchayats, which were attended by nearly 650 members of the community.



Ferro-cement Tank at Anganwadi,

A Portable Vermi-compost Pit



7.7 The sanitation project comprising 50 low cost double pit toilets and 75 portable vermin compost pits was completed at a crash speed in just 70 days which in itself is an achievement. All the beneficiaries of this project are from BPL and SC group.

7.8 Good quality construction materials including lightweight cement blocks have been used in the toilets. This increased per unit cost of the toilet to about Rs.5000. However, the quality was seen to be excellent.

7.9 The other component of the sanitation project was for provision of 75 portable vermin-compost pots. These pots are effective in producing bio-fertilizer from garbage. Since composting is done in an earthen pot, which can be moved easily from one place to another, the technology has been well adopted by the villagers. Each pot costs Rs.600.

The NGO informed that special species of worms have been obtained, which biodegrade the waste in about 40 days.

7.10 The sanitation project has been implemented in the Malayattoor Panchayat only, where the toilets were needed most. The NGO informed that most of the toilets have been provided to people falling BPL and of SC groups.

7.11 With a view to removing the doubts of the beneficiaries about the usefulness and health benefits of toilets, two awareness and education camps were organized. Nearly 220 villagers attended these programmes.

7.12 The NGO informed that a team of Project Officer, Project Coordinator, members of Gramodaya and Water Resource Committees and the beneficiaries worked day and night to ensure effective and timely completion of the project.

8.0 Community Participation

Community involvement was the focal point of the projects. The constitution of Water Resource Committees and objective selection criteria of beneficiaries greatly helped in ensuring active participation of the community. Part of the contribution of the community was adjusted against their labour and material inputs. Locally available materials were used wherever feasible. Masons from the project area were trained for construction of ferro-cement tanks.

9.0 Expenditure

The completion costs of the two projects as reported by the NGO are Rs.18.66 lakhs for the water harvesting project and Rs.3.42 lakhs for the sanitation project. Details of cost sharing amongst the stakeholders are as given below:

Project	(figures in Rs. lakhs)	
	Water Harvesting Project	Sanitation
(i) SGF Assistance	12.65 (67.8%)	2.62 (76.6%)
(ii) Beneficiary's Contribution	3.75 (20.0%)	0.35 (10.2%)
(iii) NGO's Contribution	2.26 (12.2%)	0.45 (13.2%)
Total	18.66	3.42

10.0 Beneficiaries Covered

10.1 Out of the 60 rainwater-harvesting tanks, 53 have been installed in the individual households and the remaining 7 in schools. Considering a household size of 5 persons and 750 students in a school, the total population covered under this project is about 5500. The total population of the three Panchayats is about 63750. Considering that 30% population does not have proper access to drinking water, the target population becomes 19000. Thus, the project has covered about 30% of the target population only.

10.2 As for the low cost toilets, 50 toilets have benefited as many households covering a population of about 2500. On the assumption that 30% population does not have access to sanitary toilets and of this 80% are in BPL group, the target population for the toilet project was 5600. Thus, the project has covered about 45% of the target population.

11.0 Education and Awareness

11.1 As mentioned earlier, seven education and awareness camps were organized during the implementation of the two projects. These camps were attended by nearly 875 persons of the project area. The awareness camps helped in a significant manner removing the doubts from the beneficiaries' minds about these facilities. The whole process facilitated in achieving a high degree of acceptance of the programme.

11.2 Masons for construction of tanks and toilets were selected from amongst the community. Twelve masons were trained for this purpose. The training has helped these masons finding job opportunities in similar projects elsewhere in the State.

11.3 User manuals have been prepared and distributed to each beneficiary, which would help them maintain the facilities properly. The NGO also took up dissemination of information on proper water storage, conservation and management through the assets created under the programme. A similar exercise of dissemination of information about hygienic toilet habits and recycling of bio-waste through vermin composting was taken up under the sanitation project.

12.0 Institutional Arrangements

12.1 For making the project sustainable, a number of water resource committees have been constituted in the project area. These committees are proposed to be reconstituted every six months so that each member of the Gramodaya gets a chance to be associated with the project. This will help in popularizing the technology in the entire project area.

12.2 SHGs of farmers are also being constituted to help them increase their agricultural income by eliminating the middlemen in the sale of farm produce.

12.3 With a view to utilizing the time saved by women in fetching water from long distances, SHGs are proposed to promote such income generating activities as backyard poultry, vegetable cultivation and tailoring.

13.0 Observations during Field Visit

13.1 The project area was inspected on 5-6 July 2004. Mr. Peter Thettayil, ED, the Andhyodaya along with his other Director and members of implementation team were present during the inspection. The facilities provided in Illithode village under the Malayattoor Panchayat and Thabore in the Karukutty Panchayat were inspected. One of the ferro-cement tanks provided in a school in Illithode was dedicated to the school administration during the inspection.

13.2 Two meetings of the villagers and beneficiaries were arranged in the schools, one at Illithode and the other at Thabore. These meetings were well attended. In the Illithode meeting, a large number of students from class IV to class VII were also present.

13.3 The villagers complained that the water connections provided by the Panchayats were expensive and not affordable by most of them. The water taps provided by the roadside did not have water most of the time. The area being a hilly terrain, digging of wells is difficult and expensive. Therefore, the availability of drinking water during summer months is a serious problem facing the community.



Interaction with Community at

A Proud Owner of Toilet



13.4 It was observed that most of the villagers are keen to have ferro-cement tanks and toilets. To overcome their drudgery, the villagers are ready to contribute up to 50% of the cost.

13.5 At least 10 tanks and a couple of toilets were inspected. The quality of construction was found to be excellent. The beneficiaries were proud of owning the facilities as these have removed their drudgery.

13.6 The NGO was advised to have occasional quality checks of the drinking water from the ferro-cement tanks to ensure its potability.

13.7 Fathers of both the schools were advised to educate the students about water conservation.

13.8 The Father of Thabore school was advised to explore the possibility of ground water recharge around an old well in the school utilizing the excess harvested water from the roof top.

13.9 The farm ponds and percolation tanks have been very effective in similar hilly terrain in Himachal Pradesh. The NGO was advised to try such facilities in Kochi area also. They were asked to contact RUCHI, which has implemented the SGF project in Himachal Pradesh.

14.0 Meeting with District Administration

14.1 A meeting with the District Administration, Ernakulam was held on 6 July 2004 to know the status of State Government Programmes on water and sanitation, which are funded by the Ministry of Rural Development, Government of India.

14.2 The following observations emerged from the meeting:

- (i) Water supply projects funded M/o RD under its Accelerated Rural Water Supply Scheme (ARWSS) are implemented by the water supply agencies like the Kerala Water Authority (KWA). KWA is presently implementing the VERSHA Programme in three problem districts of Kerala. The physical execution of the project comprising 1500 tanks has been entrusted to the Andhyodaya. It will take three years to complete the project at an estimated cost of Rs.2.5 crore. Thus, an average amount of Rs.30 lakhs only would be available per year for the entire State, which is far too short to meet the drinking water needs of the people. The project cost is shared in the ratio of 90:10 between GoI and State Government. GoI funds are available on submission of proper project proposals and approval by the M/o RD, which is a time consuming process.
- (ii) The M/o RD has another scheme, viz. 'Total Sanitation Campaign' for construction of toilets for the BPL families, schools, Anganwadys etc. Projects under this scheme are also required to be submitted and approved by the M/o RD, which takes a long time. Moreover, the rates allowed under this scheme appeared to be rather unrealistic. The M/o RD has kept the cost of a double pit toilet at Rs.1000, out of which its share is only Rs.300. The balance money has to be provided by the State Government and the Panchayat, which is a constraint and results in time overrun.