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**Aga Khan Housing Board for Pakistan  
WATER AND SANITATION EXTENSION PROGRAMME (WASEP)**

**Six Monthly Progress Report**

**July to December 1997**

822-PK98-14729

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## INTRODUCTION

### Highlights

1997 marks the first year of WASEP implementation. The responsibility of Programme management was formally shifted from AKHSP to AKHBP in July 1997. However, due to the delay in the completion of the negotiation process between KfW and the Government of Pakistan, the expected funding for the Programme did not materialize, making it impossible to follow the original workplan for 1997. The efforts being made by AKHBP and AKF to arrange bridging funds from other sources were partially successful, and activities were adjusted accordingly. While modifying the 1997 plans, consideration was made to ensure that the implementation targets were not largely effected, and that the trained staff were retained. This was made possible by delaying the purchase of non-critical capital equipment, deferring training and external consultancies and holding back the recruitment of new staff.

While the resource availability was limited, significant progress was made to accomplish programme targets during the period under review. A major achievement was the implementation of water supply schemes in four villages in Gilgit and Baltistan, and sanitation implementation in two villages in Chitral. In total, nearly 5500 people living in 370 households in the six villages were served through water supply and sanitation activities. Programme staff actively participated in developing planning and implementation tools including the WASEP - Village Terms of Partnership and the Implementation Strategy. The latter document serves as a guide for activities in the field and to assist in training new staff. Similarly, the job descriptions of the existing staff were reviewed with inputs from individual staff members to match the changing needs and responsibilities.

Steady progress was made with the research and development activities in the field of community water treatment. The monitoring of three full-scale and four pilot plants in different locations in Gilgit and Baltistan was initiated in July and was concluded in October. The findings of this research is expected to lead to improved and comparatively economical designs in the future.

WASEP staff continued to support the four partner communities that had been included under the IRC/PAR project. During the period under review, two of the communities completed rehabilitation of their water supply schemes.

A Terms Of Reference was signed to formalize WASEP - AKRSP collaboration for the implementation of AKRSP water supply schemes in the Gilgit region. WASEP technical staff undertook field investigations in five villages that were identified by AKRSP and submitted a proposal for implementation. It is expected that construction work in four of the AKRSP villages will start in April 1998. Also, efforts were made to formalize linkages with AKRSP and AKHSP for their support to WASEP implementation. Staff continued working on documentation of some of the WSHHSP results and lessons learned. This include reports on water quality, the water and diarrheal disease correlation study, and sanitation.

Towards the end of the year, a number of steps were taken in order to bring the existing administrative and support system of WASEP in line with that of the AKHBP. This involved development of various management systems and tools and the introduction of a new computer software for managing the financial system.

## **Senior Management and Staff Changes**

In July Mr. John Collett, former Project Director WSHHSP, completed his contract and left the country. Before his departure he compiled an End of the Project Report summarizing the activities of the Studies Project. On his departure, the responsibility of Programme management was delegated to Mr. Jolyon Leslie, the then Project Director of BACIP, who also left in September. Since then the WASEP Programme Engineer has been leading the team.

The Chitral based microbiologist left WASEP to join AKHS in November. The Project Artist had also left earlier to join AKHSP. Two of the IRC/PAR project team members who were on secondment from AKRSP and AKHSP decided to return to their respective institutions after working with the project for about two years. This resource gap in the IRC/PAR team was compensated, to some extent, by the two female staff of WASEP who were appointed during the fourth quarter. Considering the current activities, financial situation and shift of Programme leadership to AKHBP, the financial arrangements with three of the part-time workers including a microbiologist, the AKHS Health Education Support Unit Coordinator, and the AKHS Senior Accountant was discontinued.

The Programme is grateful to all its ex-staff for their vigorous and dedicated work both in the office and in the field, which concluded into the conception of a fascinating WASEP now taking off the ground.

## FIELD ACTIVITIES

### Village Water Supply Schemes

The extensive work during the Studies Phase gave WASEP a wide introduction in the area. As a result more than 50 applications were received from villages for assistance to implement water supply and sanitation schemes by mid-1997. A shortlist of these villages was prepared during the WSHHSP annual workshop in late 1996 for inclusion in the 1997 programme. Visits to some of the shortlisted villages were also conducted in early 1997 in order to verify the available information. In August, when the situation with funding was clarified the programme activities and targets were re-adjusted, and these translated into three small-to-medium village schemes. On the basis of the existing applications no further need was felt for making any announcements to invite new applications. The limitations of available resources and time, however, led to the preparation of a new shortlist of villages. While the final draft of WASEP Village Selection Criteria was ready, high priority was given to village size, local working season and accessibility in finalizing the village selection. This was undertaken using a Matrix Ranking exercise, an approach designed to prioritize villages on the basis of the selection criteria. Table 1 presents some of the major problems which were identified by the villagers related to the existing situation with drinking water supply.

Table 1. Major problems identified by people in scheme villages.

Major problems identified	Chira	Ayzenabad	Sari	Skoyo
Major water shortage, an average of four months per year	Yes	Yes	Yes	Yes
Distance of 1 Km or more between winter water source and households	Yes	Yes	Yes	Yes
Significant time and labour burdens placed on women due to water collection and transport especially during winter	Yes	Yes	Yes	Yes
Water gets turbid in the summer months	Yes	Yes	Yes	No
Existing water source/system becomes dirty as a result of upstream use	Yes	Yes	Yes	Yes
Spread of diseases because of contaminated water	Yes	Yes	Yes	Yes

A series of meetings were held in the selected villages in order to obtain villagers' consensus on the terms and conditions set in the WASEP - Village Terms of Partnership (TOP). Some of the major items in the TOP include: (a) formation of a village Water and Sanitation Committee which shall be responsible for managing the villagers' input for construction and later for scheme-management; (b) community's willingness to provide free un-skilled labour, local materials and land for construction of the scheme; (c) appointing a caretaker (plumber) for the system O&M and establishing a system for his remuneration; and (d) selecting a female Health and Hygiene Worker who will facilitate health and hygiene education related activities organized by the Programme and to act as a contact person between the village women and the Programme female staff.

The final agreement with two villages, i.e., Chira in Gilgit and Sari in Skardu, Baltistan, was reached in September. Meanwhile field investigations for system design were also continued which included

topographic surveys and water quality sampling to guide the selection of the water source and intake point. Design of the pipe network was carried out using the computer software "BRANCH". The estimated cost for the mentioned villages was such that there was budgetary provision for undertaking an additional small village-scheme in each Gilgit and Baltistan. The selection of the two additional villages, i.e., Ayeenabad, Gilgit and Skoyo, Skardu, was also finalized by the end of September following a similar process like the one mentioned above.

The construction work was initiated in early October. Except in Skoyo where the need for building a storage reservoir did not exist, the remaining three schemes comprised a storage reservoir, main and distribution pipes, and a mix of house/yard/communal tapstands. Generally, the system design included house/yard connections, however, for situations where drainage and excavation was a bigger problem communal tapstands were also provided. Despite the mentioned conditions there was a general inclination towards individual taps. Members of the village WSCs and the Committee representatives, i.e., President and Secretary, were formally elected/selected in the village general body meetings. These Committees undertook the responsibility of managing the community input during construction as specified in the TOP. With the exception of some delays in some inputs, the villagers generally complied with their responsibilities. Each community selected a system caretaker to obtain training during construction. The WSCs, in consultation with the villagers also developed systems to ensure equal and timely contributions from each beneficiary family for construction. These details were recorded by the WSCs. The Committees were also instrumental in resolving the disputes emerged in three villages in connection with the distribution of communal work and the routing of the pipeline.

Involvement of the village women during the early stages of planning and implementation was limited due to the absence of female staff. This was later overcome with the inclusion of two female staff members to the team during the last quarter. Women meetings were organized in all villages to discuss and explore the potential role that they could play in managing the schemes. The women took a keen interest in participating in the scheme management and pointed out that they could ensure the proper usage of tap water, oversee minor repair needs around the tapstand, and influence the menfolk in timely contribution and collection of user fees. In Chira and Ayeenabad, female WSCs were also formed. While it is encouraging to observe the women's interest in the management of the water supply schemes, it is also realized at the Programme that more intensive support is required in order to sustain such initiatives. It is expected that this requirement shall be met with the inclusion of more professional staff in future.

The construction activities continued till mid-December at most sites. Except for some minor works that had to be postponed for the next working season due to extreme cold, the water supply schemes were completed before the end of the year. This provides access to safer water to more than 2000 people living in 183 households in the four villages. Data on cost and coverage for individual schemes has been presented in Table 2. It shows that community contribution for construction ranged between 20 to 27 percent of the total cost. Also worth noting is the fact that the per capita cost for smaller schemes was noticeably greater than those for the larger schemes. This can be explained by the fact that the housing pattern in smaller villages was generally scattered resulting in the need to lay more pipes. The comparatively lower cost in Skoyo points to the fact that no storage reservoir was built there. In effect, the Skoyo village is comprised of two separate settlements. The eastern settlement of 14 households had a water storage reservoir built with the assistance from the Peoples' Works Programme earlier in the year, but no pipes were provided to establish the supply network. With some minor repairs the existing storage reservoir was satisfactorily used for the supply system. The western part of the village has 12 households which are using a spring as the main source for domestic water. This same spring was utilized for the piped supply, and a spring protection structure was also built to avoid the risk of contamination.

Table 2. Cost and coverage of village water supply schemes implemented during 1997.

Name of the village	# of hhs.	Population (cap)	WASEP share			Community share			Total cost (Rs.)
			Cost (Rs.)	% total	Cost/cap (Rs.)	Cost (Rs.)	% total	Cost/cap (Rs.)	
Chira, Gilgit	60	604	323,576	73	536	122,700	27	203	446,000
Ayeenabad, Gilgit	21	210	317,750	80	1,513	79,100	20	377	397,000
Sari, Skardu	76	912	326,000	77	358	100,750	23	110	427,000
Skoyo, Skardu	26	312	204,000	79	654	54,265	21	174	258,000



Figure 1. Villagers preparing site for storage reservoir in Ayeenabad, Gilgit.



Figure 2. Excavation for pipe burial in Sari, Baltistan.



Figure 3. On the scheme completion event in Chira, Gilgit.



## Sanitation and Hygiene Education

While revising the workplan for Chitral during the second half of the year, consideration was also given to the existing skills in the Chitral office. It was planned to undertake sanitation activities in two villages during the 1997 season. During the trial implementation phase in 1996 Raman and Parsan villages were included for implementation of family latrines. About 150 families in the two villages were assisted with the construction of ventilated dry pit latrines (VDPLs). The Programme had received applications for assistance from the remaining families in the two villages. Therefore, the same villages were selected for the second phase of implementation. The TOP was finalized in early September when nearly 200 families agreed to initiate construction. The WSCs in both Raman and Parsan were active and instrumental during construction. They facilitated Programme staff in various aspects of implementation including organizing village meetings, motivating owners for timely and speedy construction, and managing the external inputs at the village level. By December a total of 185 latrine units were completed including 120 units in Raman and 65 in Parsan. The minimum actual cost of a single unit worked out to about Rs. 4,000, nearly 80 percent of that was contributed by the user families in the form of labour and local materials.

Following a pressing demand for sanitation programme from village Chowodok in the suburbs of Chitral town which comprises 35 households, staff initiated the process of village meetings and dialogues in October. However, these initiatives were later abandoned when a parallel programme was introduced in the area by the District Council with assistance from UNICEF. Under the mentioned programme the individual families were offered a contribution of more than Rs. 4,000 to cover the cost of skilled labour and external materials for building a pour flush latrine. The Programme policy on subsidy levels for sanitation programme needs a thorough re-assessment keeping in view the above and some other programmes in the Northern Areas and Chitral which seem to offer better monetary incentives.

Meetings were held to discuss and finalize plans for sanitation activities in the scheme-villages in Gilgit and Baltistan. The village women were thoroughly consulted through separate meetings organized by the Programme female staff. The majority of the families in these four villages have shown keen interest to take part in the mentioned activity. Families in Chira and Ayeenabad will build Twin Pit Composting latrines (TPCLs), whereas those in Sari and Skoyo will improve their existing Balti latrines. The construction activity has been postponed till the next working season in March/April due to the pre-occupation of villagers with the implementation of their water supply schemes. It should be mentioned that in four of the above villages, there is a strong tradition of using latrine waste as fertilizer. The TPCLs and the Improved Balti Latrines have been recommended after extensive practical research and development undertaken during the Studies Project, whereas for Chitral and Ghizer where re-use of human waste was not common, efforts were being made on the R&D of the VDP latrines.

In collaboration with the AKHS Health Education Support Units (HESU) in Gilgit and Chitral, female health and hygiene education sessions were organized in all the scheme villages. These participatory sessions which made use of pictures and graphic materials focused the personal and domestic hygiene behaviors related to drinking water and sanitation. In November a four-day training workshop on participatory health education was also organized for WASEP female staff with the help of the AKHS HESU in Gilgit.



Figure 4. Health and hygiene education session in progress in Raman, Chitral.



Figure 5. Health and hygiene education session in progress in Ayeenabad, Gigit.

## Water Treatment Research and Development

The full-scale treatment plants in Oshikhandaas, Murtaza Abad and Hurchus remained functional during the review period without causing any operational problems. In all three sites, the plant operators were responsible for the system O&M. However, the Programme staff closely supervised the monitoring activities which were also undertaken by the operators. The operators were paid by the communities from the user tariff funds however, some delays in these payments also caused frustration among the operators. The WSC members who were responsible for the tariff collection and paying the operators held the villagers responsible for the above situation. According to them, difficulties were faced due to the negligence of the people in making regular and timely payment of the tariff. The majority of the Committee members reported that the tariff collection activities were exhausting and time consuming. The Programme staff are in the process of holding meetings with the villagers and the WSCs to assist them in improving the tariff-collection system. This tariff collection situation which emerged in some cases generally reflects the non-existence of a tradition of paying for natural resources like water. More intensive efforts will be needed in order to ensure the viability of such processes in the future.

Monitoring of the three full-scale plants was initiated in June and was completed in October when the turbidity in the source waters was considerably reduced. The monitoring activity involved recording turbidity readings at the inlets and outlets of various plant components. Bacteriological sampling was also undertaken periodically to assess the plant performance. From the point of turbidity reduction, the performance of the Oshikhandaas and Hurchus plants has been highly encouraging. At both sites, the raw water turbidity which was recorded to generally remain around 2,000 TUs for periods of more than a month, was reduced to less than 5 TUs. The turbidity measurements were carried out with the help of Del'Agua Turbidity Tubes, the minimum scale on which was 5 TUs. It is believed that the effluent turbidity was generally close to zero for most cases (see Figure 6).

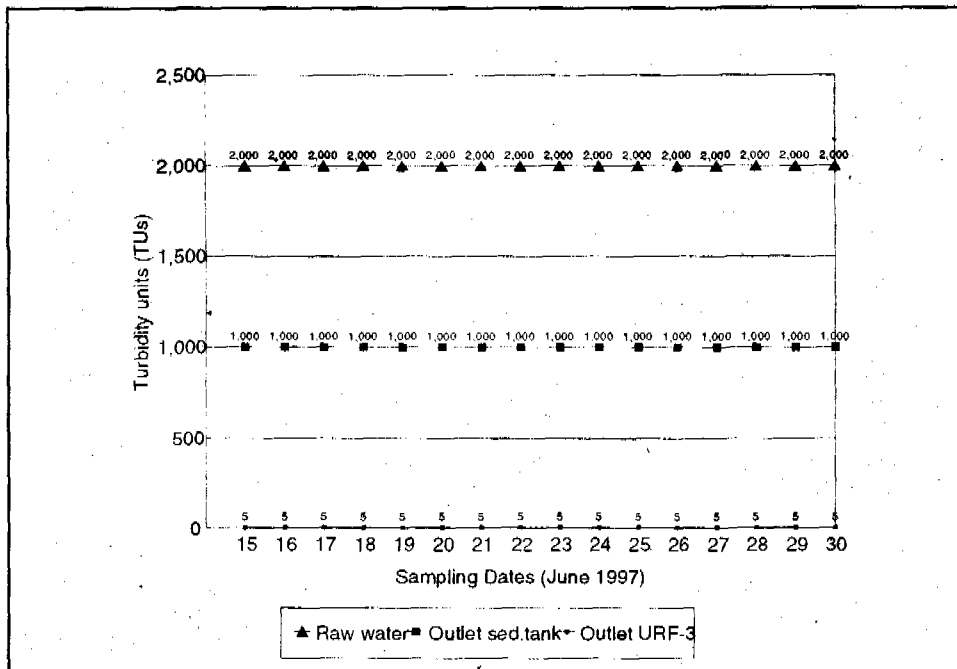


Figure 6. Turbidity removal efficiency of the full-scale plant in Oshikhandaas recorded in June.

The periodical bacteriological sampling also showed significant improvements for some cases. In Oshikhandaas, the inlet (raw) water contamination was found to be in the range of 3000 - 3400 E.coli/100 ml in August/September, which was reduced to below 25 E.coli/100 ml. Table 3 presents the data of time composite bacteriological sampling conducted in Oshikhandaas and Murtaza Abad.

Table 3. Bacteriological reduction efficiency of the full-scale plants in 1997.

Plant site	Sample cycles	Raw water (E.coli/100 ml)			Outlet sedimentation tank (E.coli/100 ml)			Outlet URF3 (E.coli/100 ml)		
		Range	SD	Mean	Range	SD	Mean	Range	SD	Mean
Oshikhandaas	9	37-3400	1433	1238	31-2450	766	583	0-22	7	8
Murtuzabad	8	40-198	46	92	23-124	36	72	1-44	12	15

It should be mentioned that the multi-stage pre-filtration techniques employed in the full-scale plants were meant to mainly deal with the high-turbidity conditions. For microbiological treatment, a slow sand filtration system (SSF), a well established technology for this purpose, was designed, but its construction was postponed until the success of the pre-filtration systems can be determined. The decision for supplementing SSFs with the existing plants shall be made after carefully reviewing the community's willingness to further improve their system and to provide more inputs for the system management. Despite reducing filtration rates, the performance of the Murtaza Abad plant still did not meet expectations. Although it generally reduces the inlet turbidity to more than 90 percent, it is still higher than what is permissible to be treated through a SSF in most cases. The un-satisfactory performance of the Murtaza Abad plant is mainly attributed to the very fine suspended particles in the raw water. These particles exhibit a comparatively low settleability in the sedimentation tank and lesser filterability at the roughing filters, as shown in Figure 7.

Experimentation has continued to result in the development of more efficient and cost effective treatment systems. Pilot plants in Danyore, Oshikhandaas, Murtaza Abad and Hurchus were established and put into operation between July and October. With the exception of Murtaza Abad, these plants include sedimentation tanks and 2-stage upflow roughing filters (URFs). In all three sites, inclined tube settlers were also tested to compare their performance with the plain sedimentation tanks. Data from all three sites show that with some modification the combination of sedimentation tanks and 2-stage URF is a viable option for treating water at these and other similar conditions. This will reduce the overall cost of the system by more than 15 percent and also decrease the requirements for system O&M. Figure 8 presents the data from the Danyore pilot plant which was run at higher filtration rates as compared to the full-scale plants in Oshikhandaas and Hurchus.

Experiments with the inclined tube settlers did not meet expectations despite the high performance reported in the literature. In Oshikhandaas, where a parallel plain sedimentation tank was operated for close comparison, the performance of both systems was found to be similar. The experimentation process of the tube settlers is planned to be reassessed in 1998 in order to ensure authenticity of the experimentation process. Similarly, the Murtaza Abad pilot plant which included a 3-stage URF with different combinations of filter media showed little improvement compared to the full scale plant and did not obtain a significant reduction at the outlet. Further experimentation will be considered to accomplish better results in the coming season.

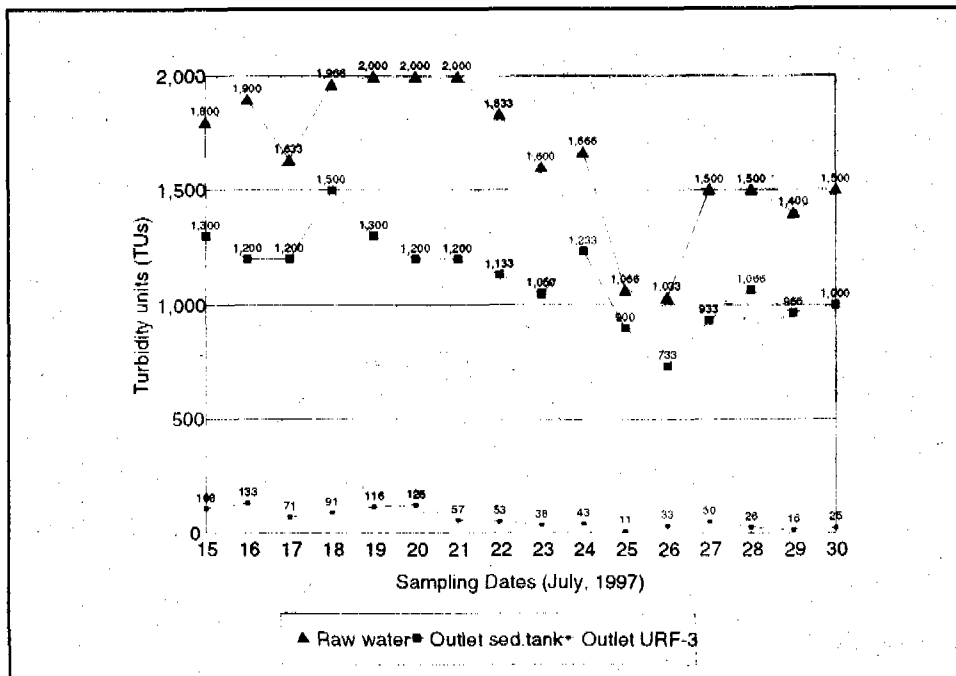


Figure 7. Turbidity removal efficiency of the full-scale plant in Murtaza Abad recorded in July 1997.

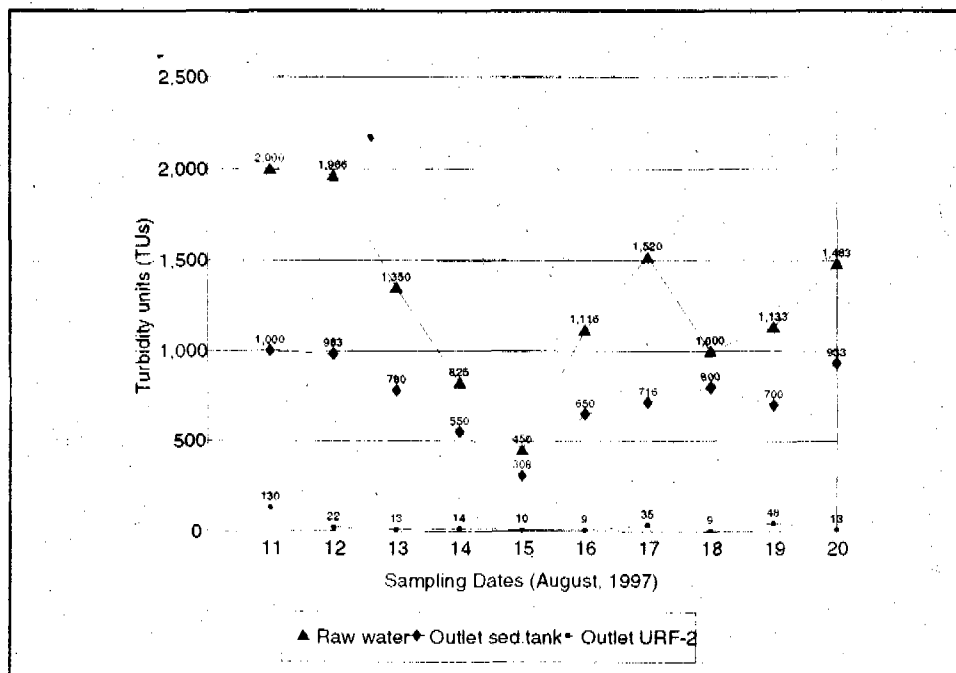


Figure 8. The performance of the pilot plant in Danyore comprising a sedimentation tank and a 2-stage URF, recorded in August 1997.

## IRC/Participatory Action Research (PAR) Project

The IRC Coordinator for the PAR project visited the Programme area in July. During her visit the existing contractual arrangements for Project management between IRC and AKRSP was shifted to IRC - AKHBP. Considering the Project's on-going activities and the unfinished agenda, the research phase which was to conclude in 1997 was extended until October 1998. Consultations were made about the possibility of WASEP participation in the proposed Dissemination phase which is expected to start in 1998. It was, however, agreed that in case of the WASEP final agreement to participate in the Dissemination phase, it should be incorporated with the WASEP mainstream activities. During her visit, the IRC Coordinator also participated in the National Reference Group workshop held in Islamabad.

A human resource crisis was faced when two of the PAR team members, including the Team Leader and the female associate who were both on secondment from AKRSP and AKHS respectively, decided to rejoin their original institutions. This resource gap, which left only one member in the team, was compensated to some extent by the inclusion of two female staff to the WASEP team during the fourth quarter. Considering the amount and the level of professional inputs that are required to complete the remaining research activities, the hiring of more resource persons on short-term contracts is under consideration. This decision shall be finalized during the proposed visit of the IRC Senior Coordinator to the area in April 1998.

The Programme staff continued to support the activities in the four partner communities, i.e., Hasis and Pakora in Ghizer; and Hoto and Ghaziabad in Skardu. Two of the communities - Hasis and Hoto - undertook rehabilitation and extension of their water supply schemes during the period under review. Also, the Community Research Team (CRT) workshops were organized in two villages and a performance evaluation activity undertaken in one. The Programme female staff held meetings with the village women and the CRTs to ensure female participation in the process and to deliver health and hygiene education training. The details about most of the above mentioned activities have been documented in various case studies and reports that have been produced by the PAR team.



Figure 9. Villagers at the site of the newly built water storage reservoir in Hasis.

## **AKRSP Water Supply Schemes**

In response to a request made in June by the AKRSP's Regional Programme Office, Gilgit, the Programme staff became involved in developing joint ventures to support WOs with the implementation of water supply schemes in the Gilgit area. After a lengthy process of consultations the TOR for WASEP - AKRSP collaboration was signed in October. Following this agreement WASEP has taken on the lead to provide technical support for implementing the WO water supply schemes. Initially five villages were identified for implementation in 1997/98. Before the finalization of the TOR, some initial surveying and preliminary designs for two schemes were completed on a trial basis in August. Following the signing of the TOR, field investigations were resumed in the proposed villages. The Programme staff also participated in the village meetings organized by the AKRSP staff. By the end of the year, the process of detailed surveying, designing and outlining estimates was completed and project proposals were submitted to AKRSP. Proposals for four village schemes have been accepted by AKRSP for the final dialogues with the communities which are expected to be held in February. During these dialogues the terms of partnership for implementation will be finalized with the communities. The proposal for the fifth village was dropped on the basis of the incompetence of the villagers to fulfill their obligations for scheme construction. The construction activities are expected to begin in April.

Following a similar request from AKRSP Chitral, a two-member team of senior WASEP staff visited Chitral and held a meeting with the AKRSP Regional Programme Officer. However, due to uncertainty with the Chitral budgets for 1997, the process of further consultations was postponed till the situation was more clear.

## **Conferences, Seminars and Visitors**

In October an extensive presentation of Programme activities and findings was made at the AKES Language Enhancement and Achievement Programme (LEAP) Conference in Gilgit. This follows an earlier presentation for the LEAP participants on the World Water Day. Also in October WASEP participated in an exhibition at Aliabad which was organized by the Aga Khan Social Service Board. At the Commonwealth Congress on Diarrhoea and Malnutrition held in Karachi in late November one of the microbiologists made a poster presentation on the findings of the Correlation Study.

In July the JRC/PAR Project Coordinator visited the Programme area. During her stay she held meetings with the WASEP management and field-staff and visited the PAR Project villages. In early September Programme staff gave a briefing and organized site visits for Dr. Jim Sarn from the Secretariat of His Highness The Aga Khan in Aiglemont. A member of the Joint Monitoring Mission visited the Skardu office in October who was briefed about the Programme activities. A twelve member team from the BRUWAS-LGRDD Quetta visited the Programme area in November. During their 5-day stay, in addition to an extensive briefing, visits were organized in a number of Programme villages. In December, a team of senior CIDA officials visited one of the WASEP scheme sites in Hunza and participated in the village meeting which was organized to mark the scheme-completion.