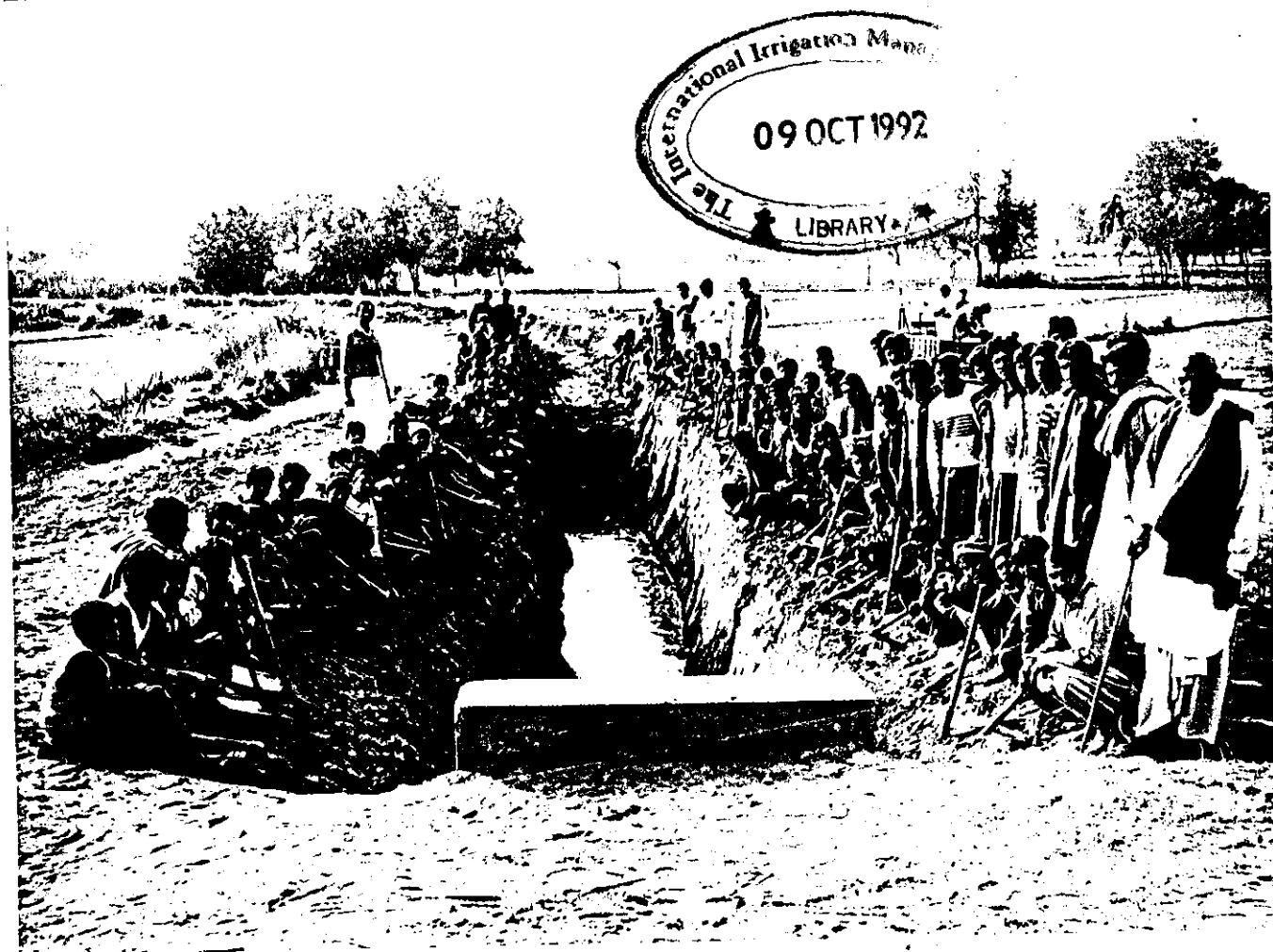


# The Punjab Desiltation Campaign during 1992 Canal Closure Period

## Report of a Process Documentation Study



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IIMI

Discussion Paper 7

September 1992

**IIMI**

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## FOREWORD

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In May 1992, the International Irrigation Management Institute (IIMI) in Pakistan started a series of publications, which we called Discussion Papers, to disseminate the results of its studies specifically to a Pakistan audience. This audience includes our colleagues in provincial irrigation and agricultural departments, and also policy makers in federal ministries and in donor institutions, as much of what we do has management and policy implications.

The Discussion Papers 6 and 7 are of particular interest to policy makers and donors as they report on research studies carried out in the Fordwah/Eastern Sadiqia area, and on the unusually heavy desiltation campaign undertaken in Punjab canals during the annual closure period of January 1992.

The Fordwah/Eastern Sadiqia area with its high water tables and considerable build-up of profile salinity will be the site of an extensive, World Bank sponsored study, titled "Fordwah Eastern Sadiqia (South) Project, Irrigation and Drainage Research". Quite a few institutions are planning to participate in the study, and the Work Plan for the 1992-93 studies is now being finalized. We expect that the first set of research results of IIMI's study, reported here in Discussion Paper 6, will be of relevance for the larger study about to be started in the area.

The annual maintenance carried out during the canal closure period of January/February was unusual in the sense that it received strong support from the Civil Authorities, under the guidance of the Chief Minister of Punjab, Mr. Ghulam Haider Wyne. IIMI's field staff have monitored the various activities undertaken in IIMI's research areas, both those on a self-help basis and those done by contractors. Afterwards, some farmers reported seeing water in the tail reaches of distributaries for the first time in fourteen years. Apparently, it is physically possible to bring water to tail reaches that had been dry for many years. But what is required to clean distributary canals sufficiently to make that happen? And is that effort sustainable and how often should it be repeated? These are some of the questions that have been addressed in Discussion Paper 7.

The data on which Discussion Papers 6 and 7 are based, were collected as part of the study "Managing Irrigation Systems to Minimize Waterlogging and Salinity Problems", entrusted to IIMI by the Government of The Netherlands.

We don't pretend that the studies reported in these two Discussion Papers present any final answers, but we are of the opinion that they raise some interesting points relevant for the management of irrigation systems in Pakistan. We hope that the papers will generate discussion -- that is why they are called Discussion Papers -- and we cordially invite you to send us your comments or suggestions.

Jacob W. Kijne  
Director

16 September 1992

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# 1 Introduction

As the supplies in the Indus basin irrigation canals are mostly dependent on "run of the river" discharges, the large volume of suspended sediment carried in the river system, particularly during the monsoons, accounts for heavy siltation of the canals. One of the major functions of the Punjab Irrigation and Power Department is to conduct periodic desilting of the canals to keep them in good working order and to thereby ensure equitable water distribution. Normally these maintenance and repair (M&R) activities are undertaken during the canal closure period in January/February each year.

Over the years, as limitations of financial resources continued to stress the departmental M&R budgets, the desired desilting program could not be sustained. The cumulative effect of this deficiency in maintenance is to reduce flow carrying capacities of the canals and cause the head reach outlets to overdraw water. In terms of water distribution, this results in considerable tail end deprivation, and socially, in increasing dissatisfaction among a large section of the farming community. An effect of shortage of canal water in tail areas is the build up of soil salinity because farmers use groundwater of less quality to supplement the available canal water.

Realizing the difficulties of having to cope with this increasing problem, the authorities had to consider the advantages of some form of beneficiary participation in the desiltation activities which were hitherto being done through the contractors. During 1981-82, such a program was tried on "self help" basis, but, as acknowledged by a departmental briefing note, the results were not very satisfactory due to lack of incentives to the participants.

In this context, the Chief Minister, Punjab stepped in to provide a motivational environment to a new desilting effort during 1992 canal closure period. Based on the personal experience he had gained in a successful silt clearance activity in 15-L Distributary in his own area, Mian Channu (Lower Bari Doab Canal System), the Chief Minister desired a more broad-based program with support from members of the Punjab political and administrative systems and from the farming community.

Since the highly publicized desiltation program was to cover the areas in Punjab where the International Irrigation Management Institute (IIMI) was also actively involved in irrigation-related field research, IIMI in consultation with the agency staff in the area initiated a study aimed at documenting the processes of this unusual mass mobilization program. The study, however, was limited to only three canal sites in Sheikhpura Irrigation Division, while the desiltation program covered a much larger area in Punjab. This paper presents the background to this study and its results relating to the processes observed at the three sites.

## 2 IIMI's Study

### 2.1 Objectives

The main purpose of IIMI's study was to understand the processes of planning, coordinating and implementing the Maintenance and Repair (M&R) activities of this year's special closure-period program, so that the performance implications of this work could be better understood and analyzed. Presumably, the resource inputs for the M&R physical work and the performance changes that may result as the output of this work, can be inter-related properly if we also understand the process of executing this work. The study was part of a larger set of IIMI activities being conducted in the area for the purpose of monitoring canal performance in general, and its output was primarily intended to feed into the progress of IIMI's other related research activities. Another objective was to draw some lessons from this rather unusual attempt at mobilizing mass support for annual canal maintenance work, for the use of future planning efforts.

### 2.2 Methodology

For this purpose, IIMI initiated in the first week of January 1992, a series of activities using a modified "participant observation" technique to observe, interact, listen and record various aspects of the processes that went into the closure period "M&R" program. The exercise was conducted exclusively through IIMI field staff who were given specific instructions initially, and continuous guidance throughout the study, as to how this Process Documentation Research (PDR) was to be undertaken (an extract of the instructions given to the field staff is at Annex 1).

PDR is a methodology used by social scientists to analyze the processes and provide the contextual data required for effective program implementation, especially suited to identify problems in the implementation of new programs and to facilitate timely adjustments with this feedback. The method has been effectively used in the Philippines to evaluate and improve the participatory approach to communal irrigation by the National Irrigation Administration.<sup>1</sup> IIMI has extensively used PDR in the IIMI-Philippines program, and has added certain modifications to the methodology to include a continuous dialogue between the observers and the implementors, and also a validation process.<sup>2</sup>

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1 For details, see Cynthia C. Veneracion (1989): *A Decade of Documentation Research*; and Romana P. de los Reyes and Sylvia Ma. G. Jopillo (1986): *An Evaluation of the Philippine Participatory Communal Irrigation Program*; Institute of Philippine Culture, Queson City.

2 Details on IIMI's experiences with PDR can be found in IIMI-Philippines research report "Farmer Organizing Farmer" (forthcoming).

As dictated by the time constraints of the canal closure period, and the limitations of skills in this regard of the resource persons deployed for this purpose, the present study could not be made a complete PDR exercise.

To assess the physical results of the canal maintenance activities, topographic surveys of Lagar distributary were carried out by IIMI before and after these activities. The impact of these physical changes on canal performance could be judged from the daily water level readings at selected places routinely taken by IIMI. However, it should be noted that factors other than desiltation also affect canal performance.

## **2.3 Study Locations**

The main study activities were focussed on the Lagar Distributary, and the Mittu Minor and the Kotla Sub-Minor of the Mananwala Distributary in the Farooqabad Irrigation Sub-Division. Both distributaries are situated on the Upper Gugera Branch, Lower Chenab Canal System. The study also benefited from additional reports on closure period desilting activities in the Kamalia (tail of Lower Gugera Branch) and Hasilpur (Fordwah / Eastern Sadiqia system) areas where other IIMI field stations are located.

# **3 Background**

## **3.1 General**

Within some 800,000 square kilometers of gross land area, Pakistan's topography ranges from high mountains in the North to flat plains in the South. The mean annual rainfall varies from less than 100 mm in the South to about 750 mm in the Northern foothills. Most of this rain is confined to about 3 to 4 months during summer monsoons. A number of rivers drawing supplies from the Himalayan glaciers and snow caps, with discharges varying from a few hundred cusecs in winter to hundreds of thousands of cusecs during the monsoons, traverse through nearly 1700 kilometers of alluvial soil plains before reaching the Arabian sea. It is this overall physical layout that characterizes and underlies the Indus Basin Irrigation System, the major part of which is in Punjab with a large network of over 38,000 kilometers of irrigation canals and another 6500 kilometers of drains.

The large suspended sediment load carried in the Indus River system during the flood season, was the main reason for the failure of the earlier inundation canals. With this experience in mind, the designers of the later canal systems faced a big challenge in reducing the volume of the silt entering the canals. Silt excluders and silt ejectors were used as part of the headwork, but to ensure that most of the silt that escaped this mechanism was carried with irrigation water all the way to the farmland, the canals were

designed with slopes, velocities and sections in regime ("non-silting and non-scouring channels"), using Lacey's "regime theory". The canals were to run most of the time with designed full supply discharge and be closed when the supplies fall short of 75% of the full supply discharge to avoid silting. Over the years, these conditions could not be met fully, thus exacerbating the problem of siltation. Silt accumulation reduces channel cross-sectional area, requiring the operating water levels to be raised to maintain design flows. A higher water level leads to reduced free-board, more bank over-topping and breaching and generally encourages further silting. It also increases flow through moghas at upstream locations, depriving farmers in lower portions of the system of their fair share of water and thereby creating an equity problem between the head reach and tail reach users. This has been observed by IIMI-Pakistan in all its research locations.

Proper maintenance attention therefore, becomes a critically important management requirement. In fact, Pakistan's canal irrigation system seems to have been designed for greater responsibility on maintenance than on operations.

### 3.2 Departmental O&M Effort

The Provincial Irrigation Department (PID) receives funds for O&M activities from the government's non-development budget (NDB), which administratively and politically, has not been as attractive as the development budget. The annual O&M allocations so received have never been seen as sufficient for the upkeep of the irrigation system. The "yardstick" for maintenance and repair (M&R) which was originally laid down in the year 1937, basically remains the same up to date, despite the multiplier effect of all the changes on maintenance needs. The yardstick has been revised in 1982, but the current annual

Table 1: Operation & Maintenance expenditure and water charge recoveries in Punjab, 1981-1986 (amounts in millions of rupees)

	1980/81	1982/83	1983/84	1984/85	1985/86
Total O&M Expend.	931.50	1007.30	1195.30	1347.30	1470.00
Surface System * (% of the total)	461.90 (49.6)	494.30 (49.1)	567.10 (47.4)	666.60 (49.5)	680.00 (46.3)
SCARP tubewells (% of the total)	469.60 (50.4)	513.00 (50.9)	628.20 (52.6)	680.70 (50.5)	790.00 (53.7)
Recoveries	593.10	688.11	760.00	782.80	792.32
Deficit	338.40	319.19	435.30	564.50	677.68

\* Surface system includes canals, flood control and small dams

Source: M. Aslam Chaudhry, "Benefits to O & M Expenditure in the Canal System in Punjab," Policy Options Briefing Paper No. 2, Pakistan Economic Analysis Network Project, June 1989, Islamabad.

maintenance allocations do not meet even this yardstick due to inflationary pressure. The inadequacy of present organization for canal maintenance, therefore, is directly related to this inadequacy of funds for O&M work.

With groundwater development through public tubewells for supplementing canal water, the O&M allocations saw a gradual increase, but at the same time the added responsibility to operate and maintain tubewells tended to adversely affect the maintenance of the canal system. The pressure on the government budgets was exacerbated by the decreasing cost recovery rates. Table 1 on the previous page shows this effect for the period 1981 to 1986.

Although the total O&M budget has gradually increased, the share of the canal maintenance has relatively declined and the deficit between the total cost and the recoveries has rapidly increased. With this decreasing financial support, it is interesting to see how the Department is coping with its responsibility to keep the canal system in good working order. One would expect the limited budget to be used judiciously, on carefully formulated priorities, and with the prime objective to optimize its productivity. However, through its long-term presence in the field, IIMI has observed various types of 'leakages' of maintenance funds, benefitting both contractors and ID staff.

An analysis of expenditure on canals of the Lower Chenab Canal (East) Irrigation Circle presents some interesting information both on the pattern of M&R allocations and the position of silt clearance in the overall M&R program<sup>3</sup>. The level of expenditure is seen to have been constant at about Rs. 7.8 million for the years 1985/86 to 1987/88, despite the annual inflationary rate of 5.3% during the period. Curiously, in the following year (1988/89), the level of expenditure has declined to Rs. 5.48 million, a reduction of almost a 30%. According to the "yardstick" estimates, the allocation, and therefore the expenditure, for the year 1988/89 should have been about Rs. 9 million.

The budget for Maintenance of Distributaries and Minors in the M&R program consists of five components: silt clearance, berm cutting, jungle clearance, repairs to banks, and repairs to masonry works. Out of these, silt clearance by itself, or sometimes combined with berm cutting, appear to consume most of the budget. In analyzing the expenditure for the Upper Gugera Irrigation Division for the five year period, 1985/86 to 1989/90, it was found that on the average about 52% of the budget was spent annually on silt clearance which is carried out during a short period of 3 to 4 weeks of canal closure. In 1987/88, almost 70% of the budget was spent for this purpose. See Figure 1 below.

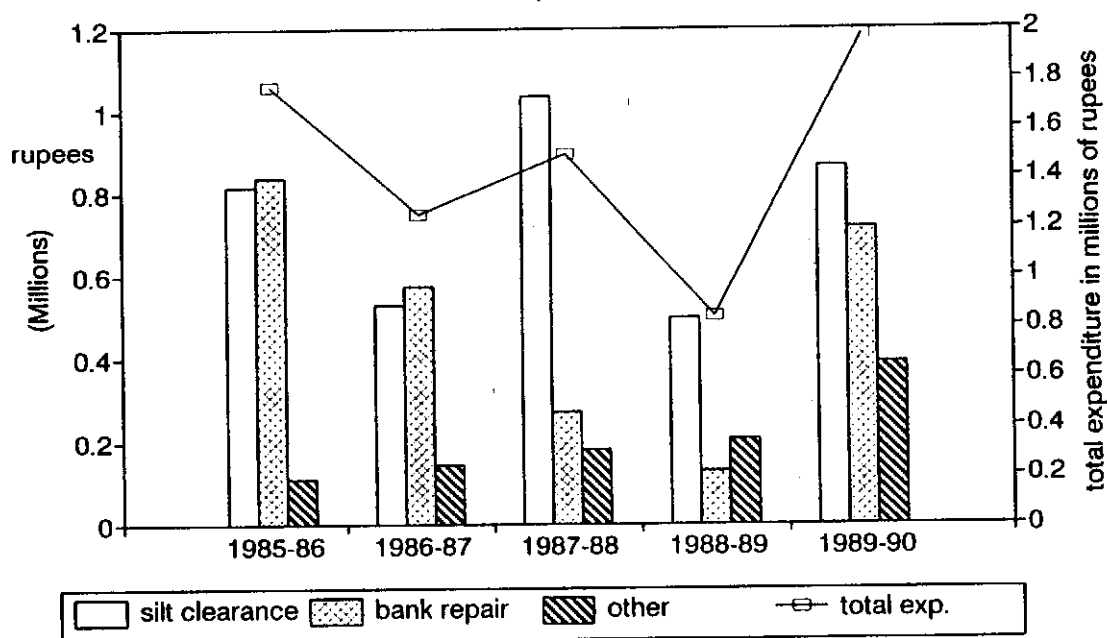
While according to the above information it is clear that the Department has placed high priority on desiltation, whether this effort can be sustained in the context of limited budgetary provisions is questionable. It is logical therefore that the authorities try to find alternative strategies to circumvent these limitations of the traditional approaches.

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3 G. R. Firdousi, "Maintenance and Repair Expenditure on Irrigation System of Punjab", undated mimeo prepared for IIMI-Pakistan.



Figure 1. Upper Gugera Division - distributaries and minors  
Maintenance and repairs expenditure



One development that has been generally observed by IIMI in the field is the increasing participation of farmers in maintenance work such as desiltation and repairing of breaches at distributary (especially tail end) and minor level. This can be seen as a reaction to the ID's inability to fulfil these tasks, and it could be stimulated and incorporated in a strategy for canal maintenance that emphasizes both sustainability and reduced dependence on government funds. However, this would require a more 'client oriented' attitude from the irrigation agency towards the farmers, who presently often find the ID indifferent to both the shortcomings in the water supply and their own efforts to do something about it.

### 3.3 High-Level Political Attention

Usually in Asian politics, building and inaugurating are politically more attractive functions than operating and maintaining. The lack of attention to the latter two functions which directly relate to the use of valuable assets, the infrastructure, can well be identified as the main reason for stubbornly persistent underdevelopment in the region. In this context, it was very encouraging to see the initiative taken by the chief political executive of the province regarding the maintenance of one of its most valuable assets, the irrigation canal system.

The Chief Minister's leadership role facilitated the issue of unambiguous instructions to the various government functionaries for important aspects of program implementation, and gave an important recognition to the self-help character of this year's desiltation program. The political significance of the program was clearly acknowledged, and the importance of the active participation by peoples' representatives in the program was

highlighted. Instructions were issued under his authority to mobilize the necessary resources.

Thus, a program which has hitherto been treated as a pure technocratic exercise, routinely and silently executed by the PID through its contractors, suddenly came within the spotlight of political recognition. The aura of publicity and the fanfare that are normally associated with such politically significant events naturally followed the initiation of the "self-help" desiltation program.

The media publicity in this instance was unprecedented for this kind of work. One advertisement that appeared in a newspaper of December 24, 1991, said:

*All Punjab Government Departments, local Members of Assembly, Federal and Provincial Ministers, Counsellors, Advisors, local social workers and students, farmers and land owners, along with their tractors and trollies, will participate in this program of cleaning canals, distributaries and watercourses. At the end of this developmental program, encouragement prizes will be awarded to those who demonstrate better performance at provincial and district levels; expenditures of the program shall be paid at the spot by the Deputy Commissioner or Assistant Commissioner of the District; diesel and oil cost for the tractors shall be paid by the Deputy Commissioner of the district. Come! Contribute to the success of this developmental "SELF-HELP" program.*

This appeared in the name of the Department of Irrigation and Power, Punjab, and its contents conveyed the information on main features of this program. Radio talks and press interviews supplemented the normal news items that appeared in the dailies.

## 4 Summaries of Process Documentation Reports

This Section presents summaries of reports prepared by IIMI's field staff located at Farooqabad and Mananwala who monitored the closure period activities in the Lagar distributary and Mananwala distributary respectively. A total of 155 daily reports were received (118 for Lagar and 37 for Mittu minor and Kotla sub-minor in the Mananwala distributary). The summaries in this Section are in simple narrative form giving a chronological sequence of events and activities, and a discussion of their contents is given in Section 5. Section 4 may seem rather long, and its contents entirely anecdotic. The reason for this unorthodox presentation is to give the reader a chance to follow the processes as closely as possible, as they were reflected in the sequential order of the daily field reports. The philosophy underlying Process Documentation Research is to try and learn directly from field level experience. The reader may, therefore, reach his own

conclusions from the facts recorded in this Section, in addition to considering the authors' interpretations given in the sections 5 and 6.

## 4.1 Lagar Distributary

Originally, the full length of both Lagar distributary and its minor Jhinda were planned to be desilted on contract basis. At the beginning of January 1992, it was decided that a middle portion of Lagar where two tarmac roads cross the canal, and its tail portion, were going to be desilted on "self help" basis, in expectation of a visit by the Punjab Chief Minister. Initially, the upstream "self help" portion was to be 10,000 feet long, later it was fixed at 7000 feet (RD 8,000 to 15,000). Downstream, the stretch from RD 50,000 to Lagar tail (RD 62,218) was selected for "self help" maintenance. Maintenance work on the rest of the distributary was awarded to two contractors. See Figure 2, longitudinal section, for the location of the different stretches.

The "self help" work was started on January 15, two days after the closure of Lagar, by the workers of the Provincial Irrigation Department (PID). On January 16, they were joined by the workers from the Provincial Agriculture Department (PAD). The PID Executive Engineer (XEN) visited the site and assured them that very soon the farmers would also join the work. Zilladars, through patwaris and numberdars, were trying to mobilize the farmers, announcements were made extolling the importance of the desiltation program, some through mosque loudspeakers. Some announcements even had threatening overtones with references to possible police action. Despite this effort, only a few farmers were observed working in Lagar at the beginning. First, they were misguided by the field level PID staff to work near Lagar head, in an area that was to be cleaned by a contractor. The next day the sub-engineer came there and rectified the error.

On January 19, the XEN again inspected the work on Lagar, along with his Sub Divisional Officer (SDO) and some newspaper reporters. This day a big crowd was desilting in the "self help" portion: school students, PID and PAD workers, Punjab Irrigation Labour Union workers, and a group of farmers, brought there by the numberdar with the threat that IIMI staff (who were seen regularly visiting the site) would report them to the police if they did not cooperate on the program !

On January 20, one of the contractors started work.

The SDO and sub-engineer surveyed part of the "self help" portion (from RD 12,000 to outlet 2R at RD 7550) to check the silt deposition. The XEN also visited them. Desiltation work was continued by many school children. PID tubewell section employees who did some dedicated work, other PID and PAD workers were less dedicated. The tubewell workers were brought by their truck and their labour union provided them with mid-day meals, whereas other PID and PAD workers travelled on their own, some of them cycling from far, and had no organization to provide them with lunch. In the morning 125 students were directed to go to Ghourdour distributary. After going there on foot, they were told by PID staff that they should return to work on Lagar. Their headmaster

refused, but after intervention by the SDO they were brought to Lagar in the truck belonging to the tubewell section. The workers of the Highways Department also came in their truck and joined the "self help" portion of Lagar.

On January 21, the participation of the PID employees was interrupted owing to some confusion arising from the transfer of the SDO in Farooqabad. With the arrival of his replacement to take over the charge from the present SDO, the workers apparently placed their sympathy with the latter and in protest over his possible transfer they suspended work in the desiltation program.

Laborers of two contractors were by now deployed at RD 5 and RD 40<sup>4</sup>, the first contractor had the stretch from the distributary head to RD 22, and the second contractor from RD 22 to the tail, both excluding the "self help" portions. At RD 40 the contractor said that he would only desilt 6 inch deep, as any deeper desiltation was not useful because the water would start "ponding". In reality his workers did very little desilting of the bed, they were only engaged in berm-cutting (i.e. widening the bed and steepening the sides). Most of the silt collected in this process was thrown on the inside slope of the embankments; part of it would slide back into the canal later. The same was seen with the work of the other contractor as well.

[Some context: Jhinda minor takes off halfway down Lagar distributary. In August 1990 farmers did heavy maintenance work on the minor, organized by an active man from Jhinda tail area, with high relations in PID. This work was partly paid for by the PID, directly to the farmers via their organizer.]

At the Jhinda minor, two active farmers (one of them is numberdar, other is the organizer from 1990) tried to mobilize all the farmers in the Jhinda command area for the cleaning of the minor. (These two farmers enjoyed good relations with the XEN, and they have asked him to use contract funds for Jhinda for clearing of bushes on the banks of the minor). The first day when farmers from only one tail village came to work, the numberdar threatened the people from other villages with legal action and even with taking away their water turns for one year if they did not participate. The next day, all three tail end villages took part in desilting the downstream half of the minor. The following day, the middle reach farmers joined to work in the upstream half of the minor.

On January 22, the SDO made a "robkar" (judicial order) to call farmers of Ghourdour distributary for desiltation work, but realizing that the desilting of Ghourdour was already under a contract, he quickly withdrew the document as the farmers could have registered a case against him.

At RD 33, the tubewell workers were desilting in a contractor's stretch, until the SDO found out the mistake and instructed them to work elsewhere. The contractor himself had

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4 It is general practice to express Reduced Distances in numbers with thousands of feet implied where further accuracy is not required; e.g. RD 22 means RD 22,000.

pointed out the error as he feared a reduction in the contract amount. In another instance, some farmers worked at RD 46 (contractor's area), this time they were misguided by the PID staff.

Expecting the Punjab Chief Minister's visit to Lagar on January 26, the preceding week was busy with work at many places in the "self help" portion (RD 8,000 to RD 15,000), but most participants were school children, PID and PAD workers, and PID tubewell section workers (the latter also worked below RD 50,000). No farmers are observed working on Lagar. Everyday, one or two schools in the area sent more than 100 students each. Sometimes, they were assisted by a tractor for accumulating the silt in heaps on the canal bed.

Brick signboards are being constructed at tarmac road bridges.

On January 23, the XEN and the SDO visited RD 15 of Lagar, where a Highways Department tractor and PID employees were working. There was some confusion as to whether this spot was the "self help" or the contractor's area.

On January 25, in the "self help" portion, the number of participants had increased: 275 students from 2 schools, 150 tubewell workers, 23 PAD beldars and one tractor. In the rest of Lagar, 4 teams deployed by the contractors were also working with a total number of 68 men. Interestingly, some workers complained to a visiting MPA that the government was not providing lunch.

Meanwhile at the Jhinda minor, a few farmers who had been absent earlier were cleaning some of the remaining portions. About 70% of Jhinda had been cleaned.

January 26 was a day of disappointment. The keenly expected visit of the Chief Minister was postponed, but people were informed very late in the day. Many students and workers of different departments were present at Lagar, but due to rain (and disappointment), not much work was done that day.

On January 27, the Assistant Commissioner (Sheikhupura), XEN and other officials came to Lagar in preparation of the Chief Minister's visit, now scheduled for January 29. Though this visit was still expected, the intensity of the work in the "self help" portion had already declined. At RD 17, five tractors belonging to farmers from Lagar tail worked at their own expenses, directed by the canal patwari, in spite of that being a contractor's area.

The contractor's teams continued working slowly but steadily.

On January 28, the PID officials were becoming visibly nervous, because the Assistant Commissioner informed them that the Chief Minister would visit Lagar next day from head to tail of the canal. The XEN inspected the whole distributary, and instructed the laborers of the second contractor to work near the tar road bridge at RD 14,500, at the end of the "self help" portion. They were brought there by a tractor trolley. Also five

farmers' tractors worked there, repairing the bank of the distributary and preparing a stage for the visit of the Chief Minister. Even a bulldozer of the Highway Department was brought there, along with workers from several departments.

Early morning the next day (January 29), PID officials came to know that instead of the Chief Minister, the Commissioner of Lahore Division was to visit Lagar that day. However, this information was withheld so that people would not lose their enthusiasm. Despite the rainy cold weather, preparations were made around the stage; hanging banners, putting white lime lines on the ground (quickly washed away in mud and rain).

Many students and workers of different departments, and some farmers are standing in the rain, the officials are waiting seated in their cars. The students and laborers are directed to go in the distributary and start working when the Commissioner is about to come.

He reached there at 13:20 and stayed for 25 minutes, walking along the distributary for about 300 feet with PID officials and media men. He did not appear to be very satisfied with the work. He walked ahead along the muddy canal bank when the XEN advised him to return. At one point he found the bank to be in a very bad condition, and remarked: "the worst I have seen in my life". The XEN said this was due to the movement of cattle, and that it would still be repaired. After this he made a short visit to the Mittu minor, also being cleaned on "self help" basis.

Following the Lahore Commissioner's visit, there was no more "self help" work on Lagar. The rainy weather and subsequent wetness of the canal bed would have contributed to this end, which also hampered the contractors' work for several days.

On February 2, the Chief Engineer Faisalabad visited the Lagar near the tar road bridge at RD 12, accompanied by the Superintending Engineer (SE), XEN, two SDO's (but not the SDO responsible for Lagar) and two sub-engineers. He was assured that the whole of Lagar was cleaned as well as this place. He was impressed by the work, saying that now the water would reach the tail, and head reach farmers would weep.

One of the contractors interviewed by IIMI staff complained that these days sub-engineer, SDO and even XEN came to inspect his work, and to urge him to do the work properly. In the past not even the sub-engineer came; it was the contractor who had to visit the PID staff to pay their "commission" (5 to 10% of contract sum) to approve the work done, and the quality of the work was generally his own responsibility. This time, he had told them that he would not be able to pay them their commission if inspections were to continue like this. Another contractor was equally disturbed by the unusual interference of higher PID officials. He referred to a visit by the SE who found the amount of silt removed from the distributary to be inadequate, judging from the silt lying on the bank. The sub-engineer had explained to the SE that a substantial amount of silt was already removed from the canal, but later people removed the silt from the bank to use in their farms. The contractor said that next time he would first plough the canal bank so that the amount of new silt could not be judged.

Later the XEN and SDO warned one sub-engineer to check the contractors work properly, otherwise they would take action against him. The sub-engineer, however, did not appear to be impressed by these warnings, and made a threat of reporting them to the anti-corruption department since they were equally involved.

On February 12 the farmer leader organizing the desiltation of Jhinda minor was still trying to get some head reach farmers to clean the portions allotted to them, at the rate of one "karm" (5.5 feet) per square (25 acre) of land owned. He wanted to make a complaint against them, but probably did not know to whom, but the SDO had told him to be patient.

On February 16 an inspection team visited Lagar distributary. The previous day and that morning, the contractors and PID staff worked together in some contractors' areas that did not look good. Other PID workers finished the "self help" portion at the tail. One contractor deliberately left one portion at RD 29 uncleaned, contrary to the request of the XEN, to show the inspection team how bad the distributary was before he started working on it. Signboards were installed indicating the boundaries of the "self help" portions.

At 11:30 the inspection team reached the Lagar tail. It consisted of Chief Engineer, Superintendent Engineer, Assistant Commissioner (Sheikhupura), XEN U.G., XEN U.C.C., three SDO's, and a press reporter. They met six farmers there. When asked, the farmers confirmed that they had done desiltation work on self help basis. On the question whether they had received fuel for their tractors and lunch during the self help activities, instead of the farmers, a person looking like a farmer who had come and later left with one of the teams vehicles, answered in the affirmative, while the local farmers kept silent.

The press reporter asked the farmers why they did not repair the ghat points. They replied that they had not received water for the last three years (this evoked a remark from the XEN that now they were going to receive water). Then the reporter asked the XEN why the PID did not repair the ghat points. He answered that the department could not prevent the farmers from taking their cattle in to the distributary. From there they proceeded to Mittu minor.

After February 16, there was no more desiltation work on Lagar. The PID remodelled some outlets, bringing their size back to design. On February 24, in the night someone opened Lagar head by removing the stop logs. Water reached up to RD 50. It was closed again in the morning by PID staff.

The PID opened the Lagar on March 1. (The criterion used for opening the canal is that the discharge in Upper Gugera Branch must first reach 4000 cusecs or 2/3 of full supply.) The same day a breach occurred on Lagar and PID staff closed it, but the following night farmers opened the distributary again and made 3 of the 6 stop logs disappear. The following morning the breach was still running and a PID beldar had to close the distributary head with tree branches.

On March 23, the contractor for the section RD 22 to 50 of Lagar gave some frank comments. Out of the sum of his contract of 115,000 rupees, he only paid 2% commission to ID staff, because he had really done all the desiltation required. The XEN had said that he was pleased with his work and would not hesitate to sign the cheque for him. The contractor said that his profit in this contract was 50,000 rupees.

## **4.2 Mittu Minor and Kotla Sub-Minor**

These two small canals are both fed from the Mananwala distributary. At RD 76 trifurcation on Mananwala, the water is divided between Mittu minor, Karkan minor and Mananwala distributary. Halfway down Karkan minor the Kotla sub-minor takes off.

Both these canals (Mittu and Kotla) have always been desilted by the farmers alone, since as far back as the farmers can remember. Their inclusion in the "self help" campaign appeared an inevitable choice. Both canals were cleaned thoroughly by the farmers only half a year before the 1992 closure period, i.e. in June 1991.

In the command area of the Mittu, there are four villages. The fields of one village are served by an outlet halfway down the minor. Three other villages receive water from the two tail outlets. Only the farmers from these three tail villages participate in the desiltation of Mittu. It is done once or twice a year. One respected farmer, numberdar of one village and Member of District Council, takes the initiative. He consults the other two numberdars and some other influential farmers about the date. One day in advance, the cleaning program is announced from the mosques. Usually about 200 farmers participate. The work is distributed according to their landholding: about five "karm" (5 times 5.5 feet) per square of land (25 acres). When all the farmers have been allotted a portion, then the cycle starts again until the tail is reached. Farmers come themselves or send a relative, a servant or a hired laborer. A defaulting farmer is fined (last year 50 to 100 rupees). Other farmers clean his portion and enjoy the fine in the form of sweets.

On the Kotla sub-minor, the process is somewhat different. There are only three tail outlets serving the fields of one big village. The canal is divided in portions to be cleaned by the different "biradaris" (kinship groups), with the sizes of the portions corresponding to the joined landholdings of the "biradaris". Within these portions individuals clean 20 karms per square of land, though at the head 1000 feet this is 20 karm as there is more silt to remove. In certain places the silt removed over the years has accumulated in 5 to 7 feet high embankments, making it difficult to throw the silt out of the canal. Here the allotment is reduced to 18 karms per square. There is no fine for defaulting farmers, rather a potential defaulter is pressurized by his "biradari" to do the work.

Kotla is silting up very fast. The crest of its intake structure is below the bed level of Karkan, so it is drawing more than its fair share of silt. The farmers are used to desilting it twice a year about a foot deep.

Prior to this year's "self-help" program, for both canals the farmers had to get permission from the PID to do desiltation. This was usually a cumbersome process including several



trips to the XEN's office. The difference this year was that the request came from the Department, a change for the better in their view.

In the framework of the provincial "self help" campaign, schools around Mittu and Kotla received letters from the Assistant Education Officer (Farooqabad) instructing them to participate in the desiltation of the respective canals starting from January 5. One headmaster came to Mittu on January 6; finding it still full of water, he waited for two hours for any government official to guide them, and left when no one turned up. Some headmasters wrote back that the canals were still running. The District Education Officer contacted the XEN and came to know that these canals were going to be closed only on January 13, so the schools received a new program starting from January 14. Every school was to come on their designated days with 100 pupils from the 9th and 10th Grades.

On January 14, the first two schools which came to Mittu found some water running in it since Mananwala had only been closed the previous day. Again they had to go back home without working. One headmaster was complaining bitterly, saying he felt embarrassed to face his pupils, and also that as annual examinations were round the corner, they were wasting valuable time. Again there was no PID person to guide them. A physical training instructor was very angry, saying,

*"We are not the personal servants of the AEO. This is not the way to order us, without confirming the program from the ID. And even the ID is not showing any interest in this campaign"*

(Much stronger words were used in this outburst).

On Kotla the farmers had closed the intake structure the previous day, so work was possible January 14. Two schools came with 240 students and started desilting the bed. Also 15 farmers with their numberdar reached there and expressed their dissatisfaction with the students' work, removing the silt only 4 inch deep. They asked the teachers to let the students clear the bushes on the banks and to lower the banks one foot or more. The farmers would do the desiltation of the canal. From the PID, two patwaris and one ziladar were present. They admitted that they were non-technical persons, not knowledgeable about bed levels or cross sections, knowing only about the crop survey. They had come there because they were ordered to.

On Mittu, a ziladar was trying to involve the farmers at this stage of the closure works, but the numberdars told him that they were planning to clean Mittu towards the end of the closure period (end of Feb.), when the canal bed will be dry and the days longer and warmer. The ziladar was not happy about this, as he wanted to see work done before the end of the "self help" campaign (end of January).

On January 15, the sub-engineer came to Mittu with a mate and two beldars to put some marks in the bed showing how deep to desilt. The sub-engineer first said that Mittu needed desilting down to the depth where the sand (silt) stops and the (original) clay starts,

but when they found this was too deep he decided the bed should be 6 inches below the outlet crest level, that is one foot below the existing bed level.

On January 18, a beldar came with a copy of the longitudinal section of the Mittu, given to him by the sub-engineer. However he does not understand it, so he cannot guide the work of the school youth. Neither can the patwaris who have been ordered to be present there, just sitting or filling their "khasras" (crop surveys).

From January 16 until January 22, daily one or two schools participated in desilting the Mittu. Every school brought 100 to 150 students who worked for 1 to 1½ hours a day. The whole of Mittu minor (9300 feet long, 4 to 5 feet wide) is desilted to a depth of 3 to 4 inches. This means that about 1300 boys removed approximately 12000 cubic feet of silt, that is 9.3 ft<sup>3</sup> per boy per day. This is less than half of what was achieved in the "self help" portion of Lagar, where the students were joined by workers of several departments.

On the farmers side, the initially expressed intention to clean the minor did not materialize. The general opinion was: "Why should I do my share of the work when my son has already worked?"

An interesting by-product of the desiltation of Mittu occurred a few months later, at the beginning of the kharif season. ID staff claimed that Mittu was drawing more water than its design, because its cross section had been made too large. So they installed a type of iron frame in the brick flume feeding Mittu minor from Mananwala distributary to reduce its flow. However, this claim seemed unfounded considering the small extent of the desiltation and the fact that Mittu's offtake structure is always free-flow, which means that the downstream water level does not influence the discharge into the canal.

On Kotla sub-minor, the cleaning program by the schools continued from January 14 to January 23. Eight schools brought on the average about 120 students daily (2 of the schools worked only for 2 days). Their main work was to clear bushes from the banks and to lower the banks somewhat. So their work was not easily quantifiable.

One school wrote a letter to the District Education Officer (DEO), that they were not interested in cleaning Kotla since their area was not irrigated by this canal. They wanted to work on Karkan minor instead. The answer was that this was not possible since Karkan was going to be desilted on contract basis, only Kotla was on "self help" basis. So they went to work on Kotla, but without much enthusiasm.

The farmers' participation on the Kotla was substantial, comparable to the farmers' work on Jhinda minor. From 14/1 to the end of January they worked daily in small groups. About 230 farmers came and worked one day. Also, on two short stretches a tractor with rear mounted blade was used. The first half of the canal was desilted 1½ feet deep and the downstream half one foot deep. Taking into account the length of Kotla of 7900 feet and its bottom width 5 feet, the amount of silt removed by the farmers comes to 50,000 cubic feet, that is 215 ft<sup>3</sup> per man-day, or 200 if we disregard the work done by the

tractor. This is an impressive figure compared to the utilization of manpower observed on Lagar (23 ft<sup>3</sup> per man-day for "self help" work, 52 ft<sup>3</sup> per man-day for contractor's work. Work on Jhinda per farmer is estimated to be of the same magnitude, though we don't have detailed data to do the same calculation.

This shows that farmers are prepared to provide substantial assistance in the form of labour in canal maintenance, and that they do this wasting as little time as possible, in a situation where they as a small group see themselves as the direct and only beneficiaries of a (small) canal. The experience contrasts with the lukewarm attitude shown by the larger groups of farmers in the Lagar.

In the Hasilpur area, IIMI's observation, though less detailed, were in general agreement with the observations on Lagar, Mittu and Kotla. Canals selected for the 'self help' program were mostly minors that were already routinely maintained by farmers. Farmers did a considerable amount of work there, assisted by school students. The PID was not participating actively in the program, nor were the local politicians involved in mobilizing farmers. The civil administration had to take initiative to mobilize farmers, schools and other government departments. To quote a comment of a civil administration officer:

*"It is not a Self Help Program, rather it is an Administration Assisted Program".*

On January 21, the planned visit of the Chief Minister to Sheikwah minor was cancelled.

## 5 Discussion

### 5.1 Evaluation of the Physical Work

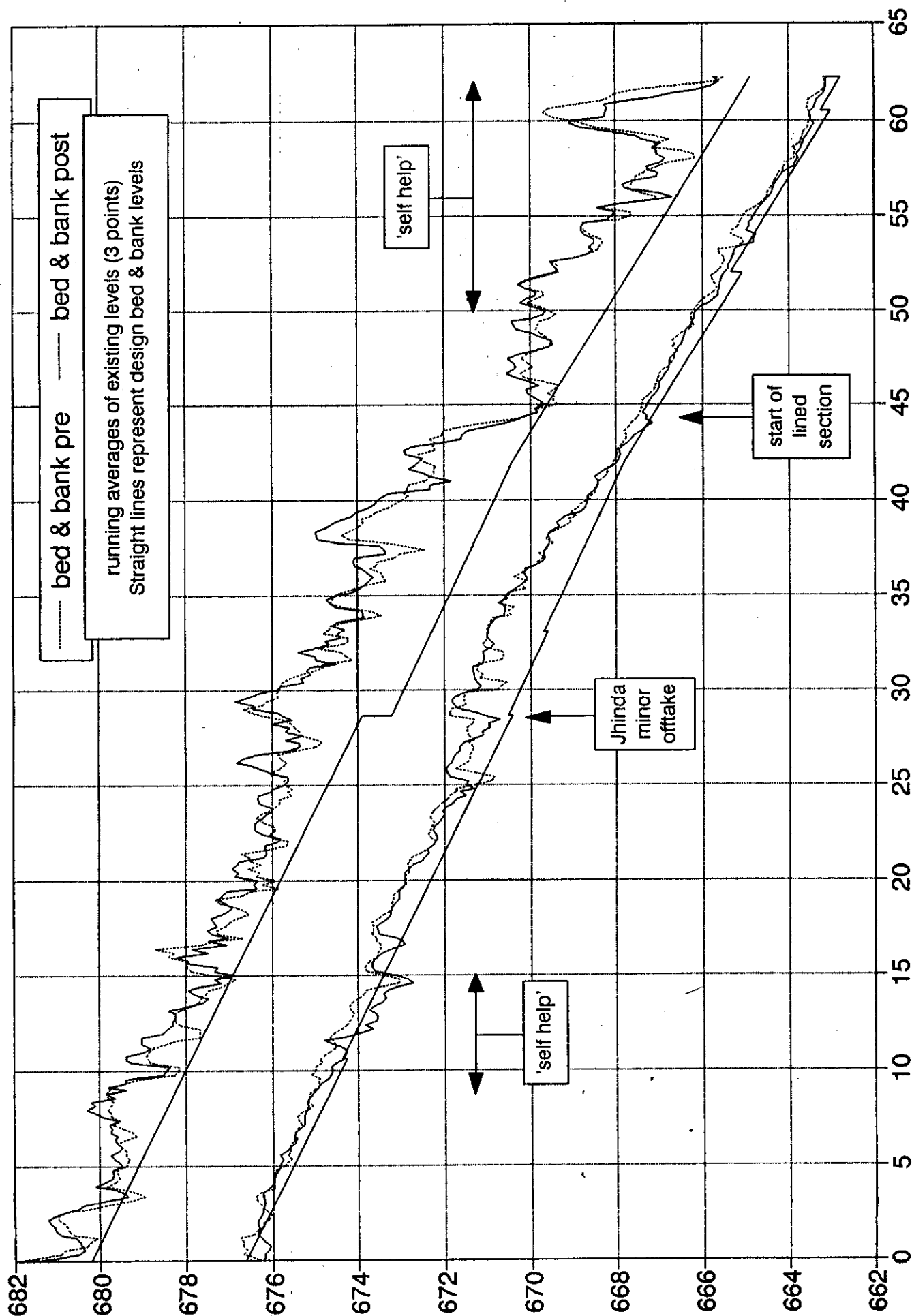
An assessment of the quality and quantity of the desiltation work on Lagar was attempted in two ways: direct observations by IIMI staff, and two topographic surveys using leveling instruments before and after the closure works. The results of these surveys are presented in Figure 2, longitudinal section, on the next page. In Annex 2 are shown 19 cross sections pre- and post-desiltation.

From the longitudinal section we see two things. Firstly, there is little difference in the bed levels before and after desiltation. This will be detailed in a later paragraph accompanied by Table 2. Secondly, the existing bed level is almost everywhere higher than the design bed level<sup>5</sup>. The difference ranges from a few inches to more than one

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5 Like the existing bed, bank and water levels, also the design levels have been changing in the course of the years. We obtained the design data from a blue-print from 1939, in which the final design levels are raised compared to the previous design levels from 1935 (because the existing levels had gone up). And 1935's design was different again from the original design dating

Fig. 2 Lagar distry 1992 survey pre & post desiltation



foot. Especially in the stretch of Lagar below Jhinda offtake (RD 28,650 to about 40,000) heavy siltation has occurred. This is due to flaws in the design of Lagar. When we pass Jhinda offtake, the design slope, design discharge and the design cross sectional area are all reduced, thus creating a reduction in the design velocity. This, of course, leads to siltation. At RD 42, the design slope increases again, and siltation becomes much less.<sup>6</sup> From the cross sections (Annex 2), we see that in the same stretch (RD 28,650 to 40,000) also the bed width is considerable less than design. The result of this siltation is that the Lagar branch of the Lagar-Jhinda diversion structure is completely submerged. Therefore the crest level of the weir in the Jhinda branch has been increased by ID staff with a ¾ foot high brick wall, to prevent a much higher than design flow entering Jhinda. This block is a continuous source of dispute between Jhinda farmers and ID staff.

In a discussion of the quality of desiltation work, an understanding of the objective of the desiltation program is important. Technically, the objective is to bring the canals back to their design dimensions. The PID does have the design longitudinal and cross sections, but it is exceptional that a topographic survey is done by the PID to know the actual condition of the canal. Design data are only used to demarcate the distributary's bed width and full supply width, which results mostly in berm cutting. PID staff and contractors appear to be at a loss about the depth to which the bed should be desilted. In some places the level of the lined bed under bridges or near drop structures is taken as design bed level. Sometimes the crest level of outlets are taken as reference level; e.g. "the bed should be desilted down to 6 inch below the outlet crests". However, even if the PID has an idea of the depth to which desilting should be done, and advises the contractor accordingly, this advice is generally not complied with by the contractor or by his workers.

Another quality control problem is the mode of supervision. It is easier to check visually the shape of the cross section than the bed level. Contractor's workers sometimes leave a small part of the berm or bed standing to show how much has been removed. This is called "burji"; it was mainly observed for berm cutting. For bed desiltation we saw only one "burji" at Lagar head of 21 inch high, not at all representative!

This problem does not exist in the lined section (RD 44 to tail), where the brick lining gives a very convenient guide for desiltation. This hidden benefit from lining, may well be as significant as or more than the benefit of reduced seepage, which diminishes after some years due to fissures in the brick lining.

From direct observations it is clear that generally the quality of the contractors' work has been questionable. Apart from the fact that the bed is not properly desilted to the required or desired depth, the silt that is excavated, mainly from berm cutting, is thrown mostly

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from before the turn of the century. When the tail-section of Lagar was lined in 1985, the design bottom width was somewhat reduced.

6 Lagar tail below RD 44 was brick lined in 1985. Instead of this or in addition to this, the section below Jhinda offtake would have benefitted more from these effects of lining: an increased velocity and an easy reference level for desiltation work.

on the inside slope of the bank, disregarding the likelihood that it will partly slide back into the canal. Another shortcoming is that the majority of the weak points in the embankment are not repaired. It is not very clear whether this is also the responsibility of the contractor under a contract for desiltation.

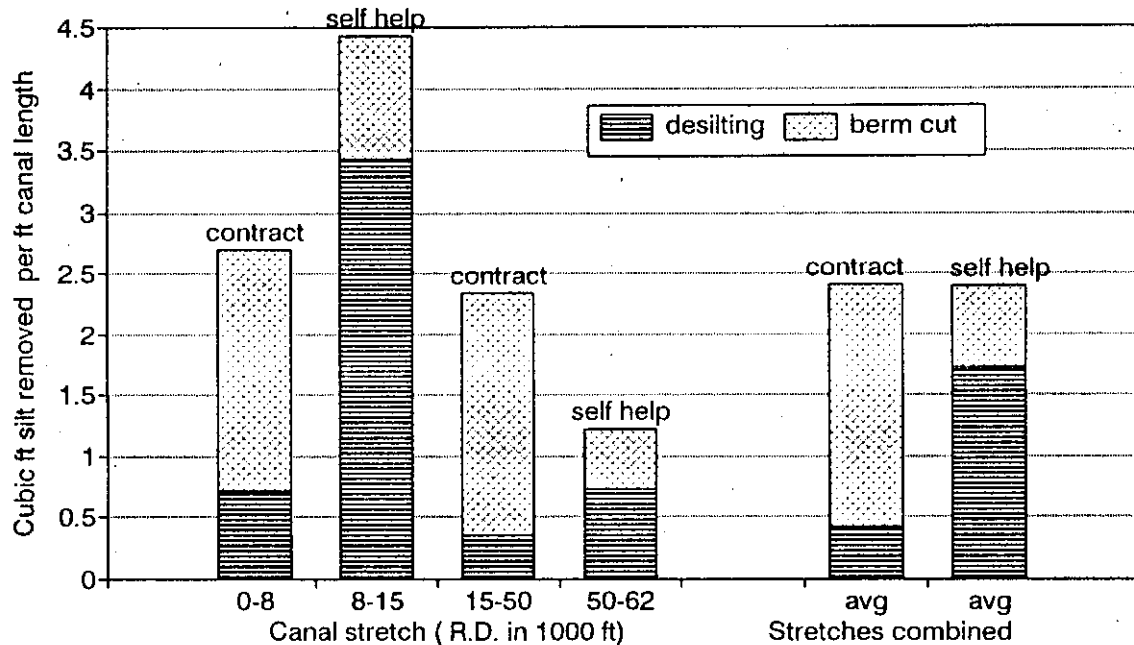
In the "self help" portions of Lagar, generally the work was observed to be of better quality. Also the self help desiltation of Jhinda minor was done thoroughly, at some places even excessively due to over-enthusiasm, where as much as two feet deep silt was removed.

IIMI's surveys before and after closure works on Lagar (Jhinda was not surveyed) give the same picture. The average depth of bed desiltation for the whole canal was 2.7 cm. For the contractors' stretches this was only 1.3 cm, whereas the average depth of desiltation in the "self help" portions was 7.3 cm. (Taking into account the different bed width of the different canal stretches.) When we consider the berm cutting work, the volume of the contractors' work per unit canal length was about three times as much as that of the "self help" work, but the volume of berm cutting could not be estimated very reliably because the number of cross sections was limited; they were not always taken at exactly the same location before and after desiltation, and the locations of the cross sections were not always representative for the canal as a whole since they were taken near outlets (or a bridge). Table 2 given below summarizes the results of the surveys.

Table 2: Results of the evaluation surveys.

Lagar canal stretch (RD in 1000 ft)	separate stretches				combined	
	0-8 contr.	8-15 self h.	15-50 contr.	50-62 self h.	con- tract	self help
length ft	8,000	7,000	35,000	12,000	43,000	19,000
bed width ft	12	11	9.5	5		
desilted depth ft	0.06	0.31	0.04	0.15	0.04	0.24
desilted volume per unit canal length ft <sup>3</sup> /ft	0.71	3.44	0.35	0.73	0.42	1.73
desilted volume ft <sup>3</sup>	5,700	24,000	12,300	8,800	18,100	32,800
berm cutting per unit canal length ft <sup>3</sup> /ft	2	1	2	0.5	2	0.68
berm cutting ft <sup>3</sup>	16,000	7,000	70,000	6,000	86,000	13,000
total excavation per unit canal length ft <sup>3</sup> /ft	2.71	4.44	2.35	1.23	2.42	2.41
total excavation ft <sup>3</sup>	21,700	31,000	82,300	14,800	104,000	45,800

Figure 3. Results of the evaluation surveys of Lagar distributary  
Silt removal per foot canal length for different types of work



Part of Table 2 is depicted in Figure 3. When we look at the total excavation per unit canal length, we find the highest figure in the "self help" portion from RD 8 to 15. The lowest figure is also for a "self help" portion; the tail stretch where the canal is small. So when we compare the averages for two "self help" portions and two contractor's portions, the amounts of silt removed per unit canal length are equal.

With our daily field observations, we can also make a rough estimate of the number of workers that were involved in both types of work on Lagar distributary. During the "self help" campaign of 10 days, about 200 people (the majority were students) were working daily. But this work force was not always working efficiently or continuously. For instance, often two students shared one "kassie" and rested alternately. Also the number of working hours was often reduced by poor travel arrangements to the sites, and other logistical problems.

The two contractors combined had on the average about 50 men working daily during a period of 40 days. These workers were making 8 hour workdays since they were supervised by a contractor paying them. So both in the "self help" campaign and in the contractor's work, about 2000 man-days of labour were invested. Combining this with the figures of total excavation from Table 1, we can calculate the amount of silt removed per man-day: 52 ft<sup>3</sup> for contract work, and 23 ft<sup>3</sup> for "self help" work. This agrees with the earlier observation that available manpower was used less efficiently in the "self help" campaign than by the contractors.

Yet even the contract work compares unfavorable with the figure of 200 ft<sup>3</sup> per man-day reported in section 4.2 for Kotla minor (and a comparable amount for Jhinda minor). Even

Figure 4. Lagar distributary  
Monthly average head and tail waterlevels for 3 years.

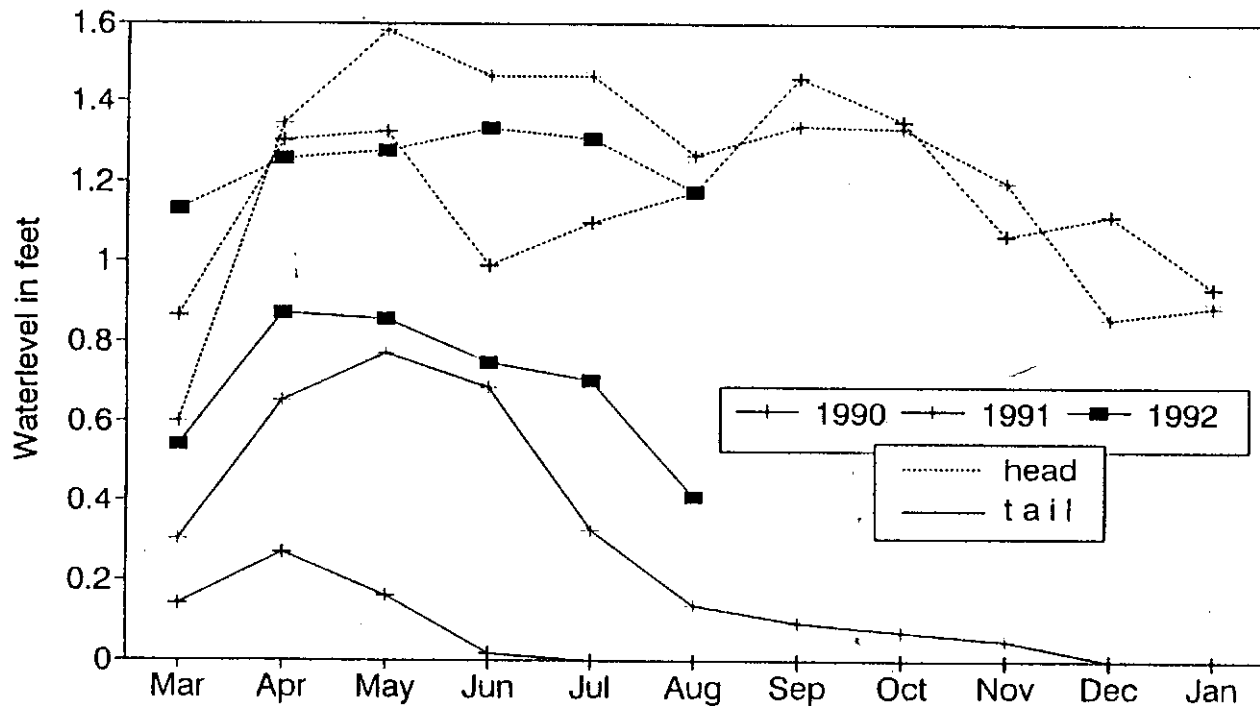
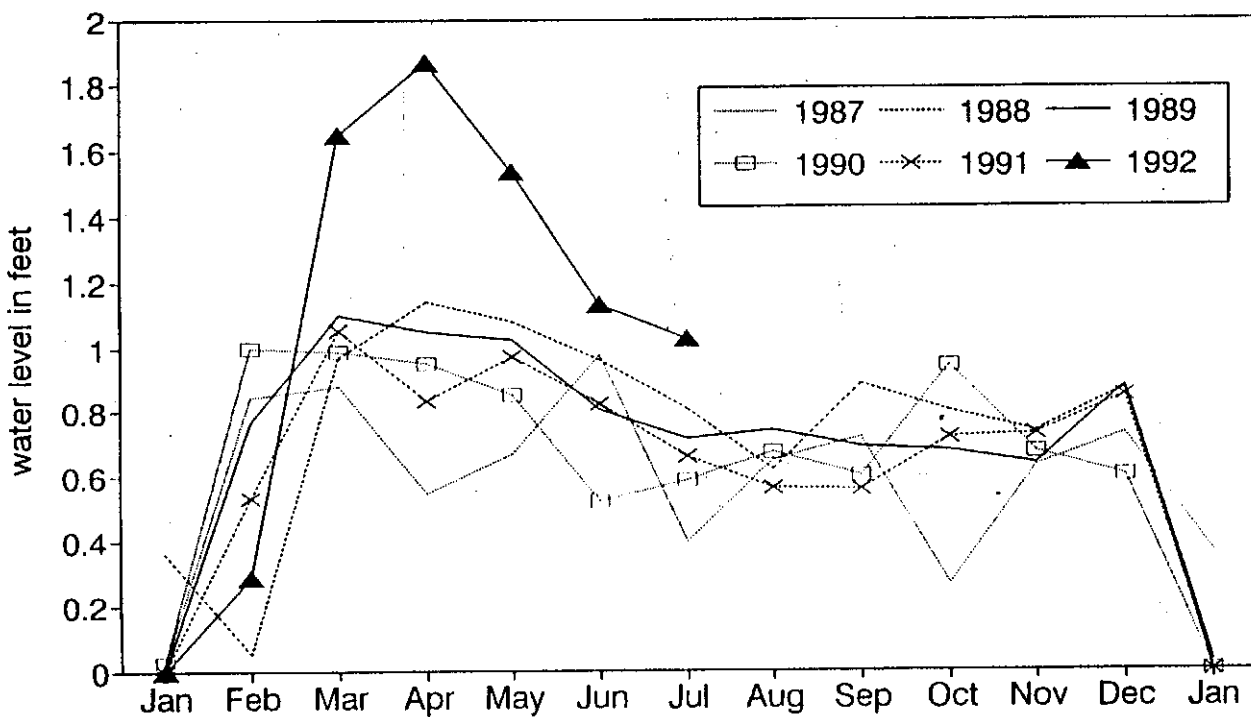


Figure 5. Fordwah distributary tail gauge  
Monthly average waterlevels for 6 years





if this is somewhat overestimated, we can conclude that farmers use their time much more productively than laborers or contractors who get paid even if their work is sub-standard, or the workers of a department who also don't have incentives to start digging with fervor in a canal which is not their regular job.

In the final progress report on the "self help" campaign by the XEN to the Deputy Commissioner (Sheikhupura), the work on Lagar was reported as completed 100% as planned (likewise for all other distributaries/minors included in the campaign). The "self help" work on Lagar was planned for 5 canal miles (25,000 feet), with a silt removal of 100,000 cubic feet. So the work reported as completed is more than twice the IIMI team's estimate of actually implemented "self help" work.

As said before, an evaluation of the effects of desiltation on canal performance is confounded by the influence of other factors on the same. In Figure 4, monthly averages of IIMI's daily water level readings at Lagar head and tail for three years are presented. Lagar tail was performing better than previous years after 1992's desiltation campaign, while the water level at the head had remained about the same. This was the combined effect of desiltation and the remodeling of several outlets at the end of the closure period. However, Lagar tail conditions had already considerably improved after the 1991 closure period. In 1989, Lagar tail conditions were so bad that farmers blocked the distributary just below outlet 17L (RD 51,550) in protest.

In Figure 5, tail gauge readings for several years for Fordwah distributary near Hasilpur are plotted. Again the tail performance after the 1992 closure period was better than it had been for many years. This was not due to the 'self help' campaign, because only one of Fordwah's minors (Jivan) was selected for this. Fordwah was desilted by contractors from RD 64 to tail (RD 139), after PID staff surveyed the distributary and indicated the desired cross section in the field. It had not been desilted for the previous three years. Also about one third of the outlets were remodeled, reducing their dimensions to the design values.

## 5.2 Planning for the Program

With the initiative taken by the Chief Minister, the Chief Minister's Secretariat issued preliminary instructions to other relevant Ministry Secretariats (Irrigation and Power, Local Government and Rural Development, Agriculture, and Education, etc.), regarding the launching of a Province-wide campaign for desilting the irrigation canals. The PID was to prepare a priority list of badly silted canals, the Deputy Commissioners who were called upon to act as "overall in-charge of the campaign" were to motivate local cultivators to contribute in the form of manpower and tractors and to arrange for their afternoon meals and POL<sup>7</sup> for tractors, and other Departments were also to provide additional manpower. Even the Police Department was to help in a quiet way.

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7 The official term for "Petrol, Oil and Lubrication".

The enthusiasm shown at the Provincial Center represents a very effective beginning of a potentially well coordinated planning exercise for the program. This was accompanied by an equally effective media thrust aimed at informing and encouraging the public to participate. However, this enthusiasm at the Center was not reflected in the field operations. Many lapses of coordination at the field level, were probably due to planning gaps as the campaign came close to the implementation stage. The study, however, could not cover all the stages of planning, particularly the activities that might have been undertaken by the Deputy Commissioner or his Assistants, and by the Chief Engineer/PID. The instances of inadequate coordination that were reported through the study suggest that this year's exercise would provide some valuable experiences towards improving the planning mechanisms for such a complex mass mobilization campaign in the future.

### **5.3 Coordination**

The case study of the three canal sites reported in Section 4 above, though not fully representative of all the activities in this year's desiltation program, points towards the important role that coordination can play in making such a program successful. The major contributor to the program when all the three sites are considered together, are the school children. The involvement of young people in a local self-help program is not only a desirable step socially, but also it can be a very productive participation economically. However, the young people have to be mobilized with utmost care and with due consideration of their emotions. Motivation is the prime criterion in bringing the youth together for a mass campaign. They need to see some discipline in the exercise, and some significant value attached to their participation by their elders.

The study reported too many lapses of coordination in bringing the students to the canal sites, either by bringing them to the wrong site, or to the correct site too early or too late, and allowing them to feel frustrated for poor decision-making, or non-availability of technical advice, or in general lack of keenness shown by the elders. A program which could have provided them with a good learning environment was eventually not fully utilized in that sense.

While the involvement of the civil administration in the program was a good strategy to coordinate between the program leadership in the PID and the other participating agencies, the value of the necessary technical inputs from the PID does not seem to have been sufficiently appreciated overall. The study points out the inadequacy of the PID's enthusiasm in this regard, which has been seen as a common deficiency with respect to both self-help, as well as, contract components. The issue that remains unclear at this stage is whether the Deputy Commissioner's leadership as the coordinator of the whole campaign could have been more effective than has been observed, in making the technical contribution to the program from the PID a more productive one. The answer lies in the traditional inter-relationships among the district based government agencies, an institutional factor which this study has not gone into this time. Experience in other South Asian countries suggest that this is a possibility.

## 5.4 Study Constraints

The process documentation effort focussed only on three sites, the reason for their selection being mainly their close proximity to existing IIMI's field stations, and the fact that there was other on-going field research by IIMI on those locations. Only one report prepared on the closure period activities outside these three canal sites was used in the study<sup>8</sup>. Although this report validated some of the main observations from the three sites on which the study focussed, the extrapolation of study results to cover the whole desiltation program in the Punjab is limited. This limitation, however, does not prevent the study from arriving at some general conclusions and formulating some recommendations for consideration in a future similar program.

## 6 Conclusions and Recommendations

The observations and measurements of the study show that the "self help" work by school students and government workers was of the same magnitude as the work done by contractors. Both types of work were insufficient to restore the required hydraulic conditions. Work done by farmers on smaller canals was considerably greater in terms of depth of silt removed and in terms of silt removed per man-day. Yet the effect of the farmers' work on their water supply is limited in those cases where their (sub-)minor or distry-tail is under-supplied due to problems higher up in the system.

The study shows that the beneficiaries are prepared to provide considerable assistance through their family labor and other resources such as tractors in a collective self-help canal maintenance program, but only on smaller canals such as minors or distributary tails, where the farmers see themselves as the direct and only beneficiaries of the canal. The PID realized this and proposed mainly such smaller canals to be included in the 'self help' program, canals which had already been cleaned by farmers as a routine in the past. Mobilization of farmers for self-help work can be more effectively done by the farmer leaders. Agency staff do not seem to succeed in playing this role, even when they threaten with punitive action, because their leadership is not readily accepted by the farmers. Also the locally elected political representatives were not actively involved in trying to get participation of the population in the three areas studied.

From the field observations and the topographic surveys it was found that the available manpower was used less efficiently in the "self help" campaign than by the contractors. Of course the picture is completely the reverse when we look at the efficiency of the utilization of PID funds for the two activities. Maintenance done under the 'self help'

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8 This report is from Saleem Malik, Field Research Social Scientist, IIMI Pakistan, based on a 3-day visit by him to Hasilpur and Kamalia areas, covering Rathi minor, Feroze minor, Sheikwar minor and Yakhar distributary.

program came free of cost for the PID, apart from creating an extra organizational strain. It was supposed to draw on civil administration funds, but this was realized only in a very limited way. Other governmental inputs in the 'self help' campaign were the time spent on its organization by the civil administration and the man-days of workers of various departments. These expenditures should have been justified by an increased participation in the canal maintenance by the beneficiaries, the farmers. It is doubtful whether this has been the case; most farmers' activities observed by IIMI would have happened even without such a campaign.

The evaluation of the considerable investment of high-school students' time in the campaign can only be subjective: one has to weigh the time lost for regular studies against the benefits of a certain amount of canal maintenance and a possible increased 'sense of the dignity of manual labour'.

Had the 'self help' campaign been better organized and coordinated at all levels, the efficient utilization of school students and government workers' time and the beneficiary participation in the self-help program would probably have been much greater. In that sense, the level of participation observed in the study indicated the potential for greater mass support in a future program.

The value of realizing this potential lies in the inevitable future search for alternative strategies to supplement the existing M&R efforts which are now inefficiently carried out using limited public funds and through poorly supervised contract mechanisms. The present context of rapidly increasing budgetary constraints further enhances this value. The administrative difficulties experienced in pursuing desired supervision over contract-based silt clearance work, would make self-help programs socially and economically viable, as PID resources need not be spent on such matters as measuring the quantity of work and making payments, but can be used more gainfully in providing the necessary technical support.

One (side-)effect of the higher political awareness and attention in the media of the problems of canal siltation and water distribution problems, is the pressure on the PID to take its responsibilities in this regard more seriously. The field observations gave some indications of this: part of Lagar was surveyed by ID staff, high level PID officers visited the canals more frequently, contractors complained that this year there was less opportunity to get sub-standard work approved in exchange for payment of 'commission' to PID staff.

The potential benefit from political leadership and support for a program of this nature has been observed as substantial. In this particular instance, had there been greater involvement by the lower level local political leadership, the program would have been of much greater value. Similarly, the role of a dedicated and motivated bureaucracy to plan and coordinate the program should not be under-estimated. The traditionally known chronic rivalries between various partners in the irrigated agriculture sector cannot be expected to lie low even in a novel mass campaign like this. In order to avoid such a breakdown, a principal coordinator may have to be found from among the more neutral

groups in the local bureaucracy. The manner in which the Deputy Commissioner's office participated in this exercise, suggests that consideration should be given to institutionalizing the planning and coordinating functions of any future self-help canal maintenance programs through the district civil administration.

This is not to undervalue the technical leadership that should be provided by the PID. In fact, our observations would amply prove that where ever the PID stepped in to give technical guidance to the participating members of the public or school children, the greater quality of desilting work was assured.

The exercise can be used also to drive home the validity of another important role in successful irrigated agriculture, that of the agriculture extension staff. A modified T&V system can be extended to the closure period M&R activities, where the Extension Worker mobilizes farmer support in specific group strengths, and Subject Matter Specialists (maybe even PID technical officers in this instance) provide the necessary training inputs to the participants. Also the On Farm Water Management staff could bring in their experience with organizing farmers' groups for watercourse improvement. If properly planned a couple of months before the closure period, this integrated exercise will be able to attract unprecedented support from all the partners of irrigated agriculture.

In summary, the following steps are recommended for institutionalizing this experience for continued efforts in the future:

- \* PID staff identify canals or canal sections for self-help M&R work in consultation with the farmers in the command area.
- \* Survey of selected canals or canal sections by PID staff.
- \* PID staff discuss the results of the survey and finalize the self-help work sites with other agencies and farmers.
- \* Deputy Commissioner summons a preliminary coordination meeting to discuss the planning process and allocation of specific tasks to various groups, and to appoint a sub-committee comprising senior representatives of the participating agencies.
- \* Sub-committee plans the mobilization of farmers and members of the public, possibly including school children, identifies logistical requirements, food and drinks, and allocates work sites and immediate supervisors.
- \* Regular meetings of the Coordination Committee chaired by the DC to review detailed planning and implementation schedules, and to monitor the progress.

- \* PID conducts post-activity surveys, and evaluates the exercise in terms of impact of the work, as well as budgetary savings, and sends a final report to concerned parties.

Finally, it should be pointed out that desiltation alone cannot solve the problem of tail end shortage of water in the canals. Such laudable attempts should necessarily be accompanied by other technical and institutional interventions to restore the appropriate hydraulic conditions in the canal system and to ensure equitable distribution of water, such as restoring outlets to their design dimensions and checking various types of illegal irrigation. This was also pointed out by the Chief Minister in one of his press statements. Resolving these issues, however, means tackling the 'law and order situation' and the distribution of power in rural areas.

## Acknowledgments

This paper could not have been written without the enthusiasm, curiosity and perseverance of IIMI's field staff to observe what happened in the field, ask questions to those involved and write this in many daily reports. The following staff members participated in the study: From Farooqabad field station: FRP Khurshid Baber, SFA Abdul Hamid, FA's Asgar Hussain, Rana Imtiaz Alam and Khalid Mehmood. From Mananwala field station: FRP Saleem Safdar and FA Javaid Iqbal. From Lahore office: Saleem Malik, Field Research Social Scientist, and Saeed-ur-Rehman, Senior Field Research Economist. To all of them, the authors are deeply grateful. Also acknowledged are the valuable comments on early drafts of this paper by the Director and the staff of IIMI-Pakistan. Finally we express our appreciation of the cooperation extended to us during the study by the Executive Engineers, Upper and Lower Gugera Divisions, and their staff.

## Annex 1: Guidelines to Field Staff

**DATE** : January 6, 1992

**SUBJECT** : Process Documentation of Closure Period Activities

This proposed research activity is to be undertaken during the Closure Period in January 1992. Detailed procedure has already been discussed with you in the field. A summary of these discussions is given below, which you may use as a set of guidelines for this specific aspect of our research work during the period.

### Objectives:

The main purpose of this study is to understand the process in which closure-period "Maintenance and Repair" activities are planned, coordinated and implemented, so that the performance implications of this work can be better understood and analyzed.

In other words, the resource inputs for this physical work and the performance changes that may result as the output of this work, can be inter-related properly if we also understand the process of executing this work.

### Study Activities:

For this purpose, the following will be undertaken by IIMI staff:

1) Collect information through:

- (i) interviews with concerned officials and farmers, and attendance as observers at their coordinating meetings. Try as much as possible to see that these interviews are informal, and generally unstructured conversations. From officials, we may try to find out how the activities were planned, how the work specifications were prepared and by whom, etc.
- (ii) direct observations in the offices, in the field and in any other work environment, and
- (iii) review of literature, leaflets, notices, circular instructions or any other reading material relating to this program.

2) Record clearly and accurately in the form of daily reports the information collected through interviews, meetings and direct observations. Each staff member assigned for this work should prepare their individual reports. These reports should be comprehensible enough to cover all important aspects of what has been observed and heard. Any figures, charts or tables that may explain things better should be incorporated.

3) Participate in discussions to be arranged soon to review the reported information, clarify main points and provide additional information if necessary.

These study activities will cover two main phases of closure-period M & R work: the planning phase and the execution phase.

The planning phase of the closure period M & R work includes the preparation of estimates, arrangements to provide additional funds, manpower and implements, holding of coordination meetings for the purpose, and organizing the farmers.

The execution phase covers all activities undertaken by the officials as well as farmers in connection with this M & R work, and includes coordination at the field level, how the contractors or farmers are mobilized, how they distribute their work, and how the officials interact with them in the field for supervision and quality control. Particularly in the case of self-help work, it is useful to study how the farmers organize themselves, under what kind of leadership, how and why they are motivated to do this work, and also what kind of conflicts emerge and how they are resolved.

#### Selected Sites:

In consultation with ID officials, two canals have been selected as the focus for this study: the Largar Distributary where the M & R work is to be done on contract basis, and the Mittu Minor in the Mananwala Distributary where the work will be done on a self-help basis.

The staff may document these processes in other canals as well. Such initiatives will be appreciated, as they can add to make this study effort more meaningful.

**CAUTION:** It is important to remember that the study is not an exercise to audit the closure-period M & R work of the ID; nor is it an attempt to find loopholes in the proposed program. Therefore, the field staff should be extremely careful to be neutral in their conduct in carrying out the interviews and observations. While recording what you have heard and observed, any personal interpretation you may like to give should be written in such a way that it can be separately identified. I suggest that such interpretations, if any, should be written in parenthesis.

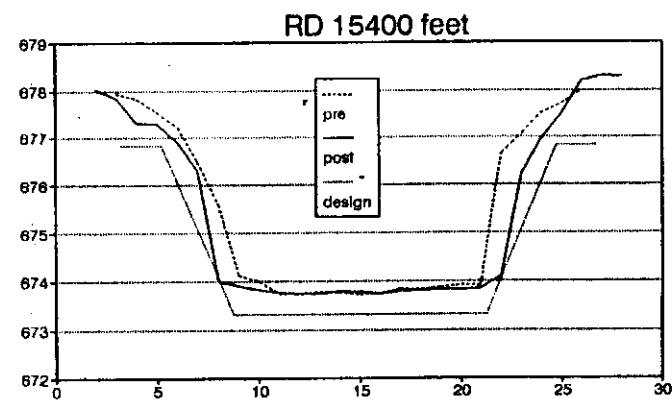
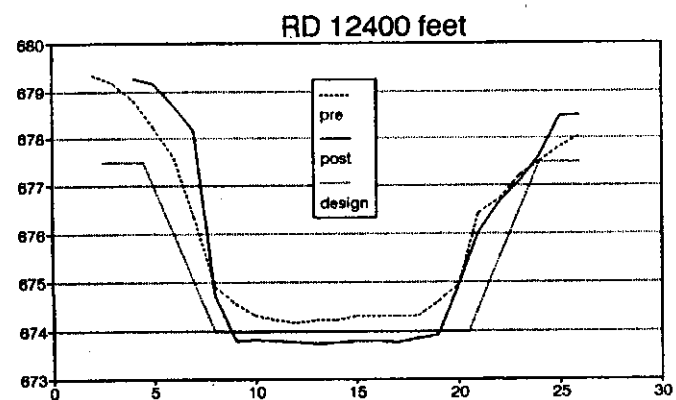
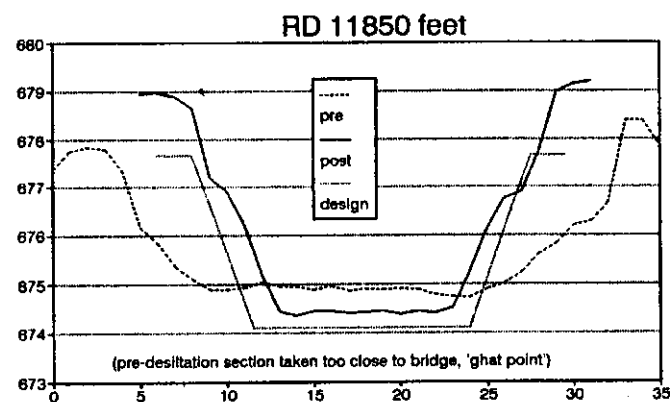
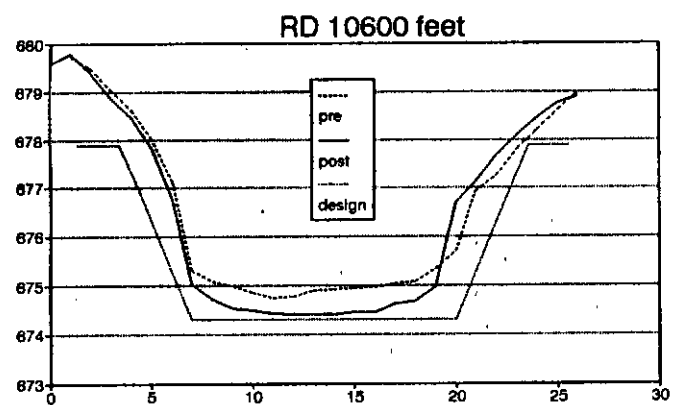
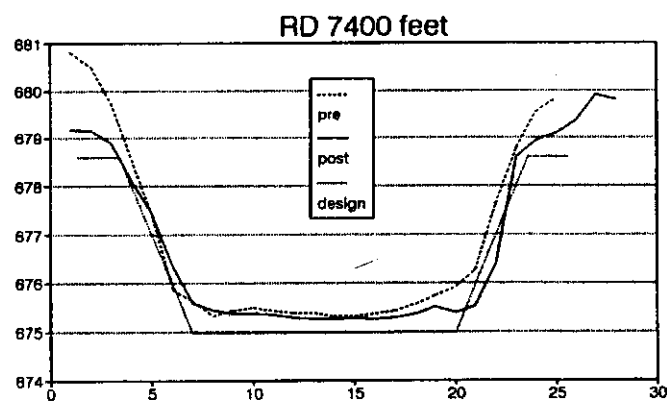
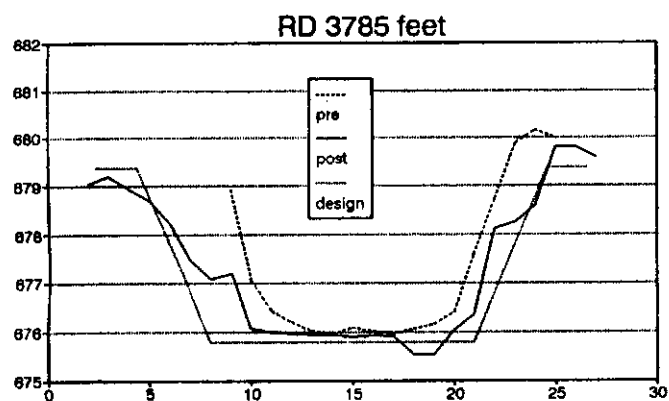
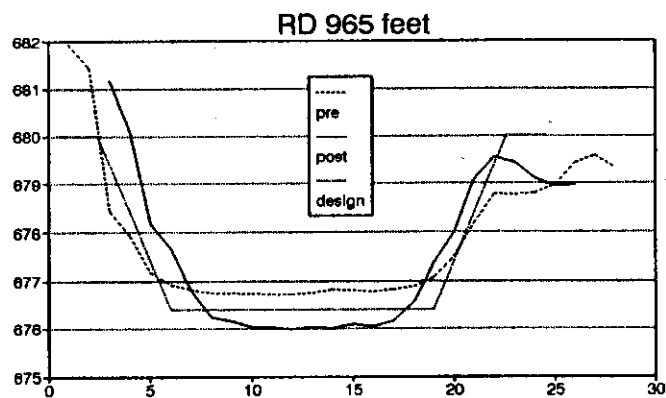
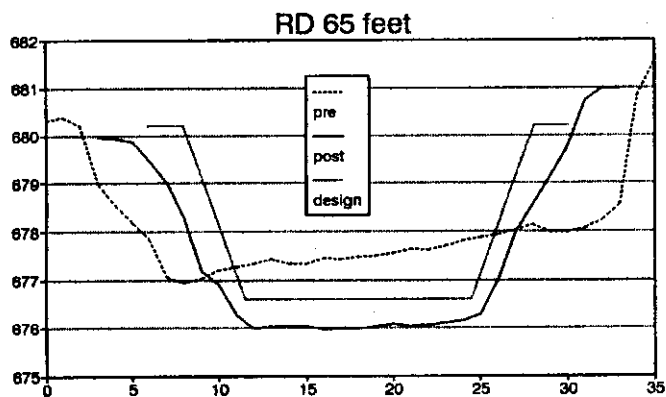
Interviews, meetings and observations should be authenticated with specific references such as names of the interviewees, places, dates and times. Recording of daily reports should start immediately with the receipt of this memo, and the first set of reports should be filed by 25/1/92.



## Annex 2: Lagar distributary cross sections

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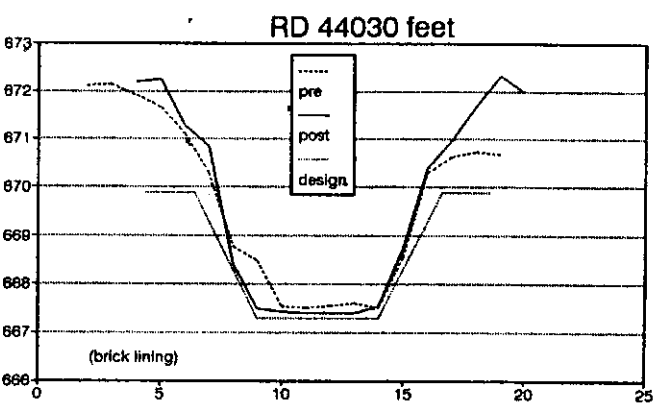
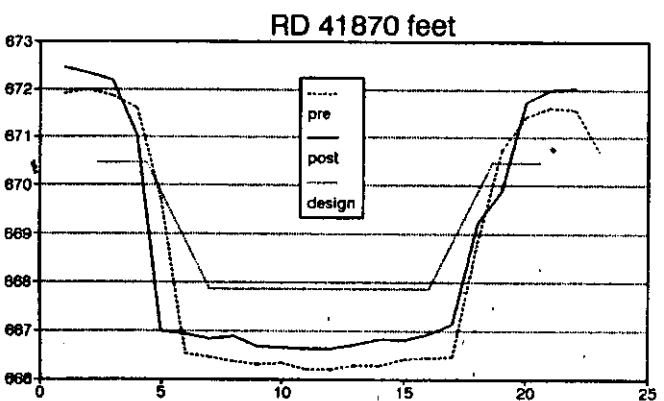
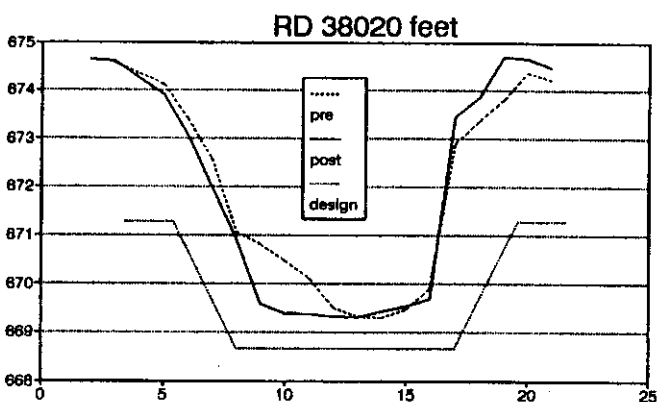
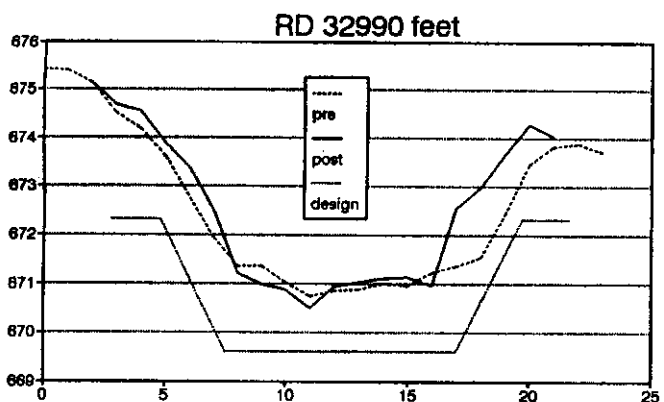
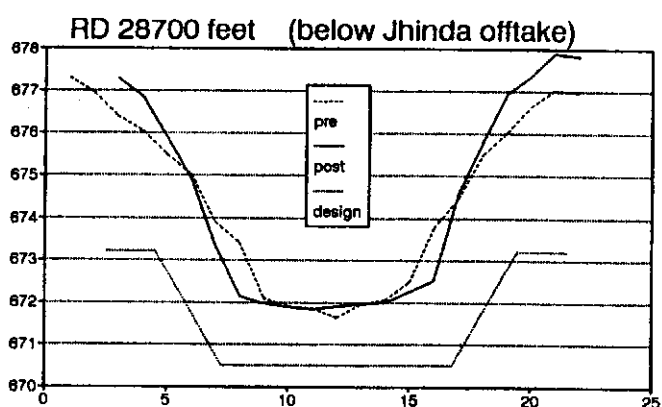
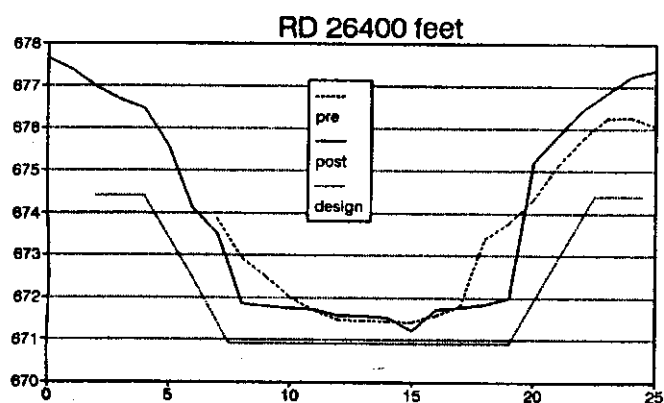
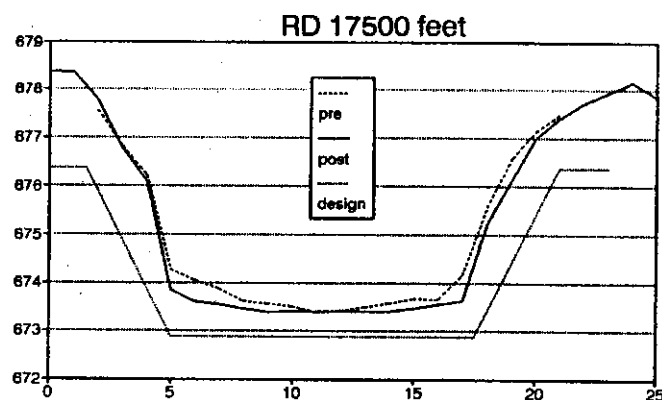
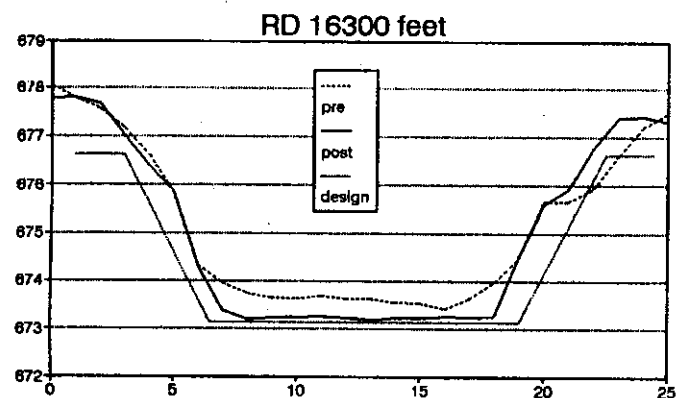
Pre and post desiltation in Jan/Feb 1992, and design cross sections



## Annex 2: Lagar distributary cross sections

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