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First

GOVERNMENT OF THE PUNJAB

FORM P.C.I. PC 1

ON-FARM WATER MANAGEMENT DEVELOPMENT PROJECT

(1976 - 77 TO 1981 - 82)

Prepared by :

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FORM PC -I

PART - A

PROJECT DIGEST

1.	Name of the Project.	On-Farm Water Management Development Project in the Punjab.
2.	Authorities responsible for:-	
	i) Sponsoring	Government of the Punjab, Agriculture Department.
	ii) Excecution	Director General Agriculture(Field) Punjab.
	iii) Operation and Maintenance.	Director,Project.
3.	Time required for completion in (Months)	Seventy two months.
4.(a)	Plan Provision	
	i) If the Project is included in the current 5-year plan, specify actual allocation.	The Project is included in the current five year plan commencing July, Ist, 1976.
	ii) If not included in the current plan how is it now proposed to be accommodated (Inter-sectoral adjustment) in allocation, or other resources may be indicated.	----
	iii) If the Project is proposed to be financed out of block provision for a programme indicated.	----
(b)	If the Project is not in the plan what warrants of its inclusion in the plan.	Already included in the Plan.
5.	Relation of the project with the objectives of the sector. Indicate the contribution of project, qauntified if possible to the targets in the five year plan and the names of other projects (whether sanctioned or under preparation) which would form part of an integrated programme within the sector.	In the Development Perspective 1975-90 7 percent annual growth of agricultural production is envisaged. This would result in self sufficiency in food grains by 1976-77. It is realized that these objectives can only be achieved with the fullest possible participation of the entire farm community. The Development plan therefore, emphasizes the strengthening and improvements of the institutional arrangements that will have to assure access of the small farmers in particular to the new technology, including conservation and efficient use of water resources by introducing improved Irrigation/Water Management and associated agronomic techniques to increase productivity. Through this the stagnancy in agriculture production will be broken.

The agricultural sector must play a central role in the economic development process in terms of increasing production, improving income-distribution and generating added employment opportunities. This project will contribute the above three spheres of this sector. The other complimentary projects included in the fifth plan are the Integrated Crop Improvement and production Plan for Cotton, Sugarcane, Wheat, Rice and Maize etc. Streamlining of agriculture extension and marketing activities etc.

The scheme will be a pilot experimental programme during next six years commencing, 1976-77. All the personnel, equipments and other facilities available in the existing Precision Land levelling and Water Management Projects, under Integrated Rural Development Programme in the Punjab will be merged with this project. An institutional net work with adequate trained technicians will be used for the implementation of follow-up programmes.

6. Capital cost of the Project.

(Rs. Lacs)

i) Local. 1861.60

ii) Foreign exchange 39.00

iii) Total 1900.60

The Government contribution in the project is Rs. 1900.60 lacs. This also includes a sum of Rs. 1120.00 lacs as cost sharing money from government side. The farmers, have also shared the costs of the precision land levelling and watercourse improvements on partial and full cost basis. This amount comes to Rs. 1185.00 lacs. In this way the overall cost of the project is worked out as Rs. 3085.60

7. Annual recurring expenditure.

(Rs. in lacs)

i) Local 436.9

ii) Foreign exchange -

iii) Total 436.9

8. Objectives of the project preferably quantitiative terms.

On-Farm Water Management Development Project will be carried out in 7 Tehsils of the Punjab covering around 4040 thousand irrigated acres. The proposed tehsils have been selected keeping in view the diversity in soil and irrigation practices, SCARP and non-SCARP, high and low salt contents etc.

The project implementation work will start in financial year 1976-77. The objectives of the project are:-

(a) To bring about a significant increase in water use efficiency through:-

i) Improvement and renovation of nine hundred water-courses.

ii) Precise levelling and improvement of 2.5 lac acre land in and around watercourse.

iii) Training and education of the farmers regarding efficient use of irrigation water and other cultural practices.

iv) Applied research will be conducted on different aspects to develop a data base and research parameters for subsequent planning and field operations.

(b) Development of an institutional net-work at the PROVINCIAL,AREA AND FIELD levels for carrying out a large scale long term programme. Under this project physical improvements, manpower training and infrastructure building and oradditional works will be taken simultaneously. The net effect of this programme will appear in the form of increased agricultural production.

(c) To establish training programme which include formal training at Provincial Headquarters and on the job training in the field. Moreover, five months training will be imparted to the Agricultural Officers(Extension) in water management techniques at the Agricultural University, Lyallpur. The targets of training programme are as under:-

	Nos
i) Technician/Officers.	440
ii) Training of Agricultural Officers at University.	90
iii) Private Contractor and bankers.	160
iv) Refresher courses.	40
v) Farmers, tractor drivers on the job training.	2020
vi) Para staff like Field Assistant/ Rodman and farmers training in water management techniques.	320

(d) A full time Policy and Programme Framing Cell will be created under Secretary Agriculture, Government of the Punjab.

(1) The Cell will undertake comprehensive socio-economic benchmark survey in the project areas. The aim is to develop a data base required for subsequent project evaluation work. A brief out line of the " Work Plan" regarding benchmark survey is appended as Annexure 'A'.

9. (a) Place and Administrative District in which the Extension Centres will be located.

A contiguous block of 7 tehsils have been selected. These are:-

1. Chinot of District Jhang.
2. Lyallpur of District Lyallpur.
3. Jaranwala of District Lyallpur.
4. Sammundri of District Lyallpur.
5. Toba Tek Singh of District Lyallpur.
6. Sahiwal of District Sahiwal.
7. Khanewal of District Multan.

The project areas are depicted on the map attached as Annexure 'B'

Lahore will be project headquarter for training and other operations under this scheme.

(b) Area and population to be covered — The scheme will benefit more than 118.92 lacs rural people of seven tehsils, either by direct impact on productivity or through demonstration effects. The total irrigated area likely to be covered is 4040 thousand acres.

10. Existing facilities Detail of existing extension work No. of demonstrations established, and results achieved from such efforts. — For the last two years a training cum motivational programme namely "precision Land Levelling Project" has been implemented. Under this the staffing arrangement was one Agriculture Engineer (Team Leader) assisted by one EADA (Soil and Agronomy). One EADA (E&M), One Assistant Agricultural Engineer in Precision Land Levelling Project. The major job had been to impart training to different categories of staff in the Agriculture Department, progressive farmers bankers and private contractors in planning, reorganizing, reshaping the farms in order to increase the water efficiency. The project had 6 tractors, 119 scrapers, 83 Land planes, 14 border discs, 18 ditchers 11 chisel ploughs and 8 other implements.

The Water Managment Project, an applied research project, had the services of one Agricultural Engineer (Team Leader), one Irrigation Officer and two assistant Agricultural Engineers. This project conducted studies on the water courses to determine water losses, designed/tested nakkas, diversions and other structures, conducted agronomic research studies on major crops with particular emphasis on water saving by way of improved practices and lining of water courses as a pilot study to determine economics of its useful-ness.

In order to provide incentive and to accelerate the pace of acceptance, these two projects implemented cost sharing programme on the basis of 50:50. A total sum of Rs.6,49,932/- were paid to the farmers as cost-sharing i.e.(Rs.3,49,932 under PLL and Rs. 3,00,000 under Water Management Project.

It is contemplated to merge these two sister projects into a bigger project, which is named as "On-Farm Water Management Development Project).

At the conclusion of Precision Land Levelling Programme,1975, Land Development Officers of the IRDP have been trained. Presently all of them are placed with the Local Government and Social Welfare Department (Punjab) with the understanding that they will be absorbed back as soon as its implementation will start. Further under the physical targets about 3200 acres, (Farmers Fields) were precisely levelled resulting in higher irrigation efficiencies. Much emphasis was laid on improved cultural practices to raise agricultural production. In this context 500 farmers were benefitted and have adopted improved water management techniques in 16 IRDP areas in the Punjab, 170 Tractor Drivers were trained in techniques of using scrapers, land planes and other implements.

The Water Management Project which was applied research in nature, conducted studies which gave useful findings & results of much help for forthcoming programmes for better management in the irrigated areas. Under the Water Management Research Project the following works accomplished:-

1. Lining of the Watercourses 66000 Rft.

2. Experimental/Demonstration trials. 127 Nos

3. Publications. 10 Nos.

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P A R T - B

II. DESCRIPTION, PURPOSES, AND BENEFITS OF PROJECT.

A. Project Description

Loss of water in the last section of the irrigation water delivery system, uneven and inefficient application of water on fields and poor cultural practices have been identified as major causes of low farm output despite irrigation in Pakistan. Evidence indicates that production increases of 2-5 fold are possible from available land and water through a carefully integrated programme involving:-

a) Improvement of watercourses to reduce delivery losses.

b) Precision levelling of fields to permit application of water uniformly to all parts of the field and

c) training of farmers in optimal timing and water application rates and other simple cultural practices such as proper seeding and fertilizer applications etc.

Field testing of water management techniques indicate that it could be feasible to implement a large scale programme involving these elements, thereby greately increasing water use efficiency and providing the basis for a several fold increase in crop output. A programme of this type carried out probably would require 20-30 years and a cost of 8 million rupees.

However, an intermediate step is required to actually test various field approaches for launching of a long term, large scale programme. The proposed on-farm water management project is designed to meet that need. It is conceived as a pilot project which will pick up in FY - 1976-77 with the previous AID grant assisted projects in precision land levelling with soil conservation service assistance and Water Management Research supported by Colorade State University.

This pilot project will include altarnative approaches in watercourse improvement, precision land levelling and dissemination of improved on-farm crop and water management techniques. It will be carried out on a scale and cover a sufficient variety of conditions to permit identification and proving of systems and approaches most suitable under different situations. In the Province, it will involve approximately 85,000 farmers with 2,50,000 acres of land levelling and improvement of 900 watercourses. It will train personnel, organize farmers into water-user groups/associations and develop an institutional base for implementation of a 20-30 year programme to rehabilitate most of the Punjab watercourses, thus bringing level of a major part of the irrigated land to precision standards and introducing scientific crop and water management on a broad scale.

Initially the two principal activities will be training of manpower and building up of basic infrastructure for physical improvements and diffusion of technology.

a) Training of Manpower.

Staff training and development of an institutional capacity are basic and extremely important requirements of the project to ensure that adequately trained manpower is made available for field operation. Under this an intensive training programme will be established to provide the field staff with adequate knowledge of skills and expertise to carry out this programme.

An On-Farm Water management Training Centre will be established at the Provincial Headquarters under the project Director. The training programme will be planned and organized by the Deputy Director. He will be provided with the well qualified staff in various disciplines. The training work will include lectures, group discussions and the most important part is the practical work in the field and at the demonstration-farm. For this purpose adequate staff, buildings, equipments has been earmarked at the Provincial Headquarter in the scheme.

Three types of training courses will be arranged under this programme. These are:-

i) Precision land levelling and water management training course.

ii) Watercourse design, construction and renovation.

iii) Water Management Training Programme for extension personnel and others at Agricultural University Lyallpur.

Private con-tractors and Bankers can also join and get training in all courses. In addition to the above a few special short-term refresher courses will be offered for the training of farmers, para staff and extension workers of the Agriculture Department.

b) Infrastructure and other activities.

Under this the project will provide a combination of different services:-

i) Watercourse reconstruction and improvement.

ii) Precision land levelling.

iii) Extension package of modern irrigation and improved cropping technology.

iv) Research on water management techniques/practices.

v) Establishment of volunteer Water User Association.

(1) Watercourse Reconstruction:- The principal activity will be reconstruction of earth ditches and installation of water control structures. Most of the high water losses on existing watercourses are due to over topping, seepage through porous ditch banks and leaks at nakkas and junctures. Reconstructing the ditches to proper design specifications will prevent over topping. Cutting down old ditch banks and replacing them with fresh earth properly compacted will eliminate most of the porousity and thus reduce seepage through the banks. Concrete structures of an inexpensive design have proved effective for eliminating leaks at nakkas and juncture points.

On some soils it will be necessary to line portions of the watercourse. This will be required on very sandy soils where seepage is important. Of the lining techniques tested so far, concrete lined, watercourses have the best benefit-cost ratio. Other designs currently being tested, such as soil cement, bricks, and cement plaster, may prove equally effective in reducing losses and will be considerably cheaper. For improving earth watercourses most of the labour will be provided by the farmers. Concrete lining can be done by the farmers and their local masons, or by private contractors. The material and technical supervision will be provided by the Project.

(ii) Precision Land Levelling Constitutes the second major element of the programme. Even applications of irrigation water cannot be made unless the fields are adequately levelled. Without engineering and efficient earth moving equipment, it is very difficult to achieve an adequately leveled field.

The primary technique to be used for land levelling focuses around a tractor drawn scraper which has been extensively tested in Pakistan and is now in commercial production and use. The method is relatively efficient and inexpensive and obtains field levels suitable for the most modern irrigation techniques.

The project will provide the engineering skills. In the first phase (six years) approximately 2/3 levelling work will be done by farmers using owned or leased equipment, and 1/3 by the private contractors who will specialize in land levelling. Approximately

60% of the land levelling effort will be within the water-courses being reconstructed and the remaining will be in the surrounding areas as farmers demand arises.

iii) Extension:- Is the third major component and one which is essential if the expected benefits of land levelling and watercourse improvements are to be realized. Farmers obtain very low yields per unit of water stored in the root zone. Modern irrigation practices and crop production methods are largely unknown. Plant-soil water relationships are neither adequate nor extended in Pakistan. If given better knowledge of techniques, farmers could achieve higher efficiencies in delivery and application even with existing ditches.

For these reasons, the programme will include a strong extension component. This effort will differ in its substance from any currently available in the province and subsequently will require substantial re-training of extension staff. The concepts and practices to be extended include the following:-

- New methods of irrigation:
- Plant-soil-water relations,
- Maintanance of field level.
- Maintanance of watercourse improvement.
- Interaction between irrigation and fertilization.

The On-Farm Water Management activities will be disseminated through audio-visual aids, group/mass meetings, distribution of posters, pamphlets and brochures etc " Farmers day" will also be held in the project areas.

(iv) Research:-

The Research component for such types of programmes is equally important to establish on proper lines. The ultimate intension is to develop and introduce the most appropriate water management techniques on large scale in the Province. In the past attempts have been made to identify and develop certain techniques for watercourse lining, (to check seepage and spill over losses), designing and fixing of concrete junctions/nakkas on experimental basis under the conditions suitable to the local areas. In this project it is very much desired to identify research on different aspects not only relating to watercourses, but also to develop standards and specifications for different types of implements needed for Precision Land Levelling operations under varied condtions in the project areas.

The Research efforts will be in line as well as in continuity with already established research activities under Precision Land Levelling Project/Water Management Project.

Precisely, the future research efforts will be made to develop:-

i) Alternate techniques for watercourse improvements.

ii) Appropriate techniques for the maintenance of watercourse in project areas.

iii) Forming and introduction of rules and regulations for proper, maintenance of watercourses and farmers fields.

iv) To help in the fabrication, development and testing of equipment and structures etc.

These research activities will be planned and conducted by the technical staff at headquarter and with Deputy Director Training.

v) Water Users Association.

This project intends to involve the farmers to a great extent. The farmers are required to contribute in the operation of watercourse rehabilitation in terms of manual labour. Since the Project cells for physical improvement and renovation of infrastructure (Watercourses), the farmer's participation during and after the Project operation is a dire necessity. In this regard it is required to motivate the farmers to organize volunteer Water Users Association. These associations will comprise of farmers sharing the water on a specific watercourse. At present these associations will have no legal protection but in due course of time it can be protected and organized under specific regulation/laws. The major function of such Water Users Association would be:-

i) To organise farmers to undertake the watercourse improvement work.

ii) To make arrangements for the supply of manual labour to the field team as per requirement of the programme.

iii) To undertake follow up maintenance work for watercourses.

B. ORGANIZATION.

The Secretary Agriculture, Punjab, will be the overall incharge oftheproject and will have a planning and evaluation cell. The major functions of the cell will be to plan, formulate the policies for the operations andevaluate results of this project. The immediate task of the cell will be to conduct a Bench-mark Socio-Economic survey in the project area to set up a data base for regular planning

and evaluation in subsequent phases. Research data will be collected for bridging the existing gaps in the policy framing at different levels which will be equally useful for planning and proper formulation of new projects in this and other allied fields.

Director Project, stationed at Provincial Headquarters will be the incharge of the project implementation and will work under Director General Agriculture(Field). Further under this project a multidisciplinary service organization will be established. Briefly, it will include a provincial headqaurters, training and field operation staff. For details see organization chart(Annexure 'D'). In addition U.S.AID will provide the part time expertise services for the training of newly recruited staff and technicians.

Under the field operation, area level training and technical support staff will be placed for watercourse planning, construction, precision land levelling, and On-Farm Water Management assistance etc. Area level teams will be responsible for coordination checking and supervision and provision of technical support to the field teams.

The Area Team will consist of:-

1. Water Management Coordinator	1
2. Assistant Agricultural Engineer.	1
3. Assistant Agronomist.	1

Four Area Teams will be established in the project area, according to the formulation of the Field Teams during the six years of project commencing 1975-76.

A key element of the plans for the implementation of this project is the formation and development of Water Management "Field Team" in the Province. The Field Team comprised of specially trained technicians which will work directly with the farmers and their associations in all aspects of project implementation. Each team is composed of the following:-

i) Water Management Specialist (Team Leader)	1
ii) Watercourse Development Officer (W.D.O.)	2
iii) Land Development Officer. (L.D.O.)	5
iv) Agricultural Officer. (A.O.)	1
v) Beldar/Helper.	7

The total number of Field Team in operation in the province during the six years programme will increase from five in the first year i.e. (1976-77) to 40 in the year 1981-82.

Before the commencement of the operational plan of the project positions of various categories will be filled by the experienced trained personnel of the present functional unit on priority basis.

A schedule of the project technical staff at different levels is given below:-

T A B L E - I

TECHNICAL STAFF DISTRIBUTION IN THE PROJECT 1976-77 TO 1981-82

Organization/level	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82
Planning Cell.	13	13	13	13	13	13
Provincial Headquarter and training staff.	9	25	25	25	25	25
Foreign Experts:						
Technical Support Soil conservation Service.	2-2/3	2/3	2/3	2	-	-
Colorado State University.	One man year	One man year	One man year	One man year	One man year	One man year
Area Team/Personnel.	1/2	1/3	2/5	3/7	4/9	4/9
Field Team(Team Personnel).	40	90	135	225	315	360

Through USAID grant funding the Soil Conservation Service an Irrigation Agronomist and Engineer plus approximately one third of Team Leader and Agricultural Economist will be provided through 1980. One technician will be provided through out the remainder of project.

Colorado State University support will be approximately man per year for Agriculture Extension Advisor located in Lahore.

12. GIVE DETAIL OF COMPONENTS OF PROJECT AND ADMINISTRATIVE ARRANGEMENTS FOR IMPLEMENTATION AND OPERATION OF PROJECT (WORK PLAN).

A. Work Plan.

a) Training.

This component includes the training of manpower of different catagories over the six years of project life. Detail is as below:-

TABLE - 2

TRAINING PROGRAMME AT HEADQUARTER
Persons to be trained year-wise

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
- Technicians and Officers training in precision Land Levelling and Water-course improvement.	40	80	80	80	80	80	440
- Private contractors, Bankers and Farmer training.	10	30	30	30	30	30	160
- Para staff, Field Assistants and Farmer training in Water Management techniques.	10	50	50	70	70	70	320
- Tractor driver on the job training.	20	200	400	400	500	500	2020
- Refresher courses (No.Sessions) (Short-term).	2	5	5	8	10	10	40

It is planned for all personnel under this project to go through one month formal training on precision land levelling and two month on-the-job training. The Development Officer(Watercourses) will have one month training at the project headquarter on watercourse improvement and maintenance techniques. They will then be assigned as apprentice watercourse engineers in the improvement of at least one watercourse under the direction of an experienced watercourse engineer.

Another important element of the training will be for the Agricultural Officer (Extension) in water management, they will have one month core training at the provincial headquarter in precision land levelling, water management techniques. Later on they will be placed with Agriculture University at Lyallpur for five months training in extension and water management techniques, followed by 6 months of on-the-job training.

Precision land levelling training will be given to 20 to 24 trainees in each batch, out of which 16 will be staff members of the project and the remaining may be private contractors, Bank Officers or Farmers.

The Deputy Director will regularly assess and evaluate the impact of training programme and will adjust it to make it more useful.

b) Field Operations. Sweet

Four Area Teams will be established to provide technical support to field teams, each at Lyallpur, Chiniot, Khanewal and Sahiwal.

Their duties & responsibilities will include:-

i) Provide on-the-job training to field personnel.

ii) Provide technical support and leadership in all water management activities, including the planning and design of complex projects.

iii) Spot-check completed work for compliance with standards and specifications.

iv) Assist field personnel with the gathering of basic data and preparation of watercourse reorganization and improvement plans, and development of farmer organizations.

v) Provide technical support as necessary to field staffs for water course construction activities.

vi) Participate in the collection, analysis and summarization of cost-return data.

vii) Assist the Policy and Programme Cell in conducting bench mark survey.

The Field Team will be responsible for actual field operation and functions of the teams under the proposed scheme are:-

i) Technical assistance, including quality control designs for contractors.

ii) Administration of the incentive of cost-sharing programme on land levelling and water management programme.

iii) To conduct an information and demonstration programme to creat demand.

iv) Encouragement for establishment of private contractors.

v) To provide competent long term assistance to farmers in on-farm water management activities.

vi) To collect and develop research data for the improvement of farms.

vii) To encourage local manufacture of agricultural inplements and equipments.

The Field Team is expected to complete one watercourse during first year and when they have gained sufficient experience, their annual targets will be raised to seven or more watercourses per year. The team will also assist farmers in levelling about 2,000 acres per year. The field team will establish a camp office in a nearby town, where they will move to the place of work.

B. Sequancing of Technical Components of Programme.

The approach to be used in providing a package of innovations to farmers (watercourse renovation, precision land levelling, and water management advisory service) is the selection of cluster of about 5 watercourse in a target area sufficiently small so that good logistical support is possible and personnel can reach work sites without difficulty from their camp office. Gener ally, the area should have a radius of less than five miles. Activities of the team will be phased so that work within the cluster is efficiently done. Water-course improvement will be on the selected watercourse, but land levelling and extension services will be made available on a demand basis to the whole area.

i) Advertising and Application Phase.

The water management specialist (Team Leader) and his staff will be assigned selected target area. They will work with local extension service personnel and radio stations and newspapers, providing them with basic information and programme outlines designed to make farmers aware of the low delivery and water application efficiencies and to disseminate general information on potential benefits of the project.

As interest is stimulated, direct contact with farmer leaders will be made by the project personnel. They will deliver to the leader of each community in each watercourse command area, an outline of the watercourse improvement and land levelling programme printed in basic Urdu. It will explain:

a. The improvement to be made and how much water is saved on the average by such improvement, and the potential for increased crop production that can be achieved following these improvement.

b. The commitment and work required from the farmers.

c. the services and structures provided by the Government.

d. where application forms for this programme can be obtained, how and to whom application can be made.

e. and when the cut off date will be for application, and how selection will be made from the applications.

The Team Leader assisted as needed by local extension personnel will provide application forms, accept applications and provide further information and assistance to farmers group which express interest in the program.

ii) Water-course Selection Phase.

With advice from local extension agents and in accordance with published criteria for selection, the team leader assisted by senior member of his staff and in consultation with Water Management Coordinator will review the applications and develop a tentative priority list of watercourses for improvement.

Field team leader along with his staff will collect the detailed information on the top ten watercourses. When this information is available the supervisor or nominee ~~form~~ from headquarters will join the team in assigning priorities. (according to criteria for selection as discussed later).

iii) Organization, Planning and Commitment Phase.

The selection decisions will then be reported to the farmers. A topographic survey will begin on the first priority water-course and meetings will be held with water users on the top five watercourses. Each group will be asked to organize to at least the level of appointing an executive committee which has authority to represent them in planning and in the required operational decisions. (Where desirable, more formal organization patterns designed to facilitate the program will be suggested). At this meeting the farmers and the team members will go over the plan and the commitments of both sides and will sign an implementation agrement including the schedule for improvement.

It will be stressed that if farmers fail to provide the committed labour on schedule, the team will move on to the next

watercourse on the priority list.

On the basis of this plan and signed agreement, funds will be obligated by the Department of Agriculture for the Pakka structures, ditch lining, or other materials required.

iv) Posting and Initiation of Land Development Officers.

If prospects are sufficiently favourable in the area, arrangements will be made with a bank to handle the cost-sharing funds and land development officers will be posted in the cluster area and will begin levelling work on a demand basis both in the selected watercourse command areas and outside.

v) Construction.

Watercourse Development Officers will set alignment and levels for the farmers, who will do all the earth moving and packing along the watercourse. When the earthen improvements meet the design specification, the Pakka structures will be installed under the supervision of the engineers, usually using labour provided by the farmers. The executive committee of farmers will work with the watercourse engineer to plan the daily schedules and work assignments (See Section E) for additional information on PLL contractor requirements.

vi) Demonstration Farm.

One model demonstration cum-motivational farm at some ideal place in Lahore tehsil will be established. The main objective is to demonstrate to the farmers and trainees irrigation water management, and improved agricultural practices. For this purpose a farm of about 50-75 acres having good soil, adequate irrigation water will be rented.

The following technology will be employed:

a. A detail soil survey will be made.
b. Tubewell water will be analysed.
c. The farm will be surveyed and planned.
d. The fields will be precisely levelled and ditches improved.
e. Irrigation water will be measured and applied according to the need of the plants.
f. All other inputs like water, seed, fertilizer, pesticides etc, will be applied at proper time.

The farm will provide training fields for trainees for management of irrigation water and other inproved cultural practices. It will be in fact a labouratory for training activities and provide basic information/data to replenish teaching material. Demonstration plots will also be laid on the farmer's lands to test, evaluate the benefits of On-Farm Water Management activities. All necessary inputs will be provided by the project.

It is also planned to reconstruct, renovate some of the selected watercourses in Lahore Tehsil for demonstration to the trainees, farmers', Technical staff, including Assistant Director Farm and other personnel are provided.

vii) Field Team Headquarters and Maintenance.

When the demand for land levelling is satisfied, the team will move its headquarters to a new location from which it can serve the development needs. The team Agricultural Officers will be responsible after construction operations for maintenance and Agriculture extension activities.

The Water Management Specialist/Agricultural Officer will pay visits and maintain contacts with farmers on the completed watercourse commands to provide guidance on touch up work on levelled fields and maintenance of watercourses etc.

viii) Programme Evaluation.

Two of the most important requirements for success in the water management improvement programme are continuing monitoring of various activities with systematized feed back into effective and objective evaluation. Two types of regular evaluations are necessary. First a builtin monitoring and internal evaluative process to provide adequate feed back for programme improvement in all programme activities, such as precision land levelling, watercourse improvements, water users association, training, and on-farm advisory services. For example, in each training programme each trainees progress will be evaluated at the conclusion of the formal training and during and at the end of the on-the-job training. Field work including watercourse improvement will be monitored regularly by project staff, by auditors and on a spot-check basis by other Government representatives Secondly, the overall on-farm water management programme will be formally evaluated after two year by acombination of internal and external evaluation staff. These evaluations will cover each activity, including physical improvements, training programmes and institutional development. The evaluation team will include experienced engineers, an economist, an agronomist and a sociologist who have been given training in the evaluation of on-farm water management programme.

As a prerequisite for evaluation, each program component will have a set of clear and specific measurable objectives and targets, which will be revised a appropriate after each evaluation. Most of the project activities including precision land levelling, watercourse improvement training and water management advisory services programme will lend themselves to this type of evaluation. The watercourse feasibility data collection step will provide a bench mark against which benefit can be measured after the work is completed.

C. Handling of Credit and Cost-Sharing Funds.

i. Land Levelling.

Funds received by the farmers for cost-sharing of land levelling will be transmitted through a local Commercial Bank after certification is given by the L.D.O. that the levelling meets the required specification. The local branch of the Commercial Bank Agricultural Credit Bank will be associated to handle the credit requirement of the farmers. The line of action for this will be as follows:-

a. After it has been determined that conditions are favourable in an area, arrangements will be made with a local bank to advance supervised credit. There will be agreement on the criteria, forms procedures and training of bank officials how to appraise initially and what to look for during inspection prior to disbursing funds.

b. Interested farmers (and or groups of farmers) will get a Land Development Officer to his field, design and prepare estimates and contact a land levelling private contractor or other agencies for a bid, if required.

c. The farmer will take the design and the bid to the bank if he desires credit. If only cost-sharing is desired no bank contact is necessary.

d. The bank will check the proposal, inspect the land if necessary and agree to provide funds for creidt.

e. If funds are approved, the work will be completed by the contractor (or by the farmer himself).

f. The Land Development Officer (LDO) will inspect the completed job and certify it.

g. The contractor will take the certificate to the bank for payment and give a receipt when paid.

ii. Watercourse Improvement.

Funds to be used to pay the costs of diversion structures and their installation, to the extent they come from project funds, will be handled directly by the Department of Agriculture and Project personnel.

a. When a watercourse design is completed and recommended by a team, this will be approved by the Project Director.

b. Against this, the team leader can draw a specified amount from the Coordinator.

c. The team leader will buy appropriate precast structures and other materials for installation.

d. The assigned team members will supervise installation as work progress.

e. At the end the team leader and a member of the farmer's executive committee will certify completinn.

f. The Department will make regular inspections to ensure performance and maintenance of standards.

D. Criteria for the Selection of Watercourse Command Areas.

Almost all watercourses command areas in Pakistan are in need of

some improvement. The pilot project activity will be limited to those watercourse commands with a high probability of success. The goal of the criteria outlined below is to identify as closely as possible those command areas which have the most potential for a significant success and will benefit small farmers.

These criteria include:

i) Farmer Interest

To be included in the development programme, farmers in a watercourse command must agree to participate in programme activities and meet specific conditions. If some farmers are reluctant to participate, the group will either try to persuade them to join the others, or propose a plan where by the non-participation of the farmers, will not be a problem. Farmers will have to select their own leaders, agree to support decisions of these leaders, do the earth work, participate in the planning processes, make arrangements for mesons and transport supplies from central points of delivery to installation sites, sign agreements with contractors and the development team, arrange for use of any equipment which may be made available for farmers, provide for maintenance of the watercourses, Farmers willingness to accept those responsibilities will be an indication oftheir level of interest in the programme. Farmer interest will be a key requirement for further assistance.

ii) Potential for Increased Irrigated Acreage.

Watercourse command areas where farmers can increase their irrigated acreage should be given high priority in the selection. There are areas on many watercourses which presently cannot be cultivated due to shortage of water or topographical problems. With increased supplies of water resulting from reorganization and improvement of watercourses to reduce losses, both cropping intensities and irrigated acreage can be increased.

iii) Availability of Credit and Inputs.

In project areas it will be essential that inputs, such as fertilizer, seed and insecticides are readily available and that credit be available to the extent needed. The Government through the banking institutions will make arrangements for necessary credit with the rapidly expanding numbers of fertilizer distributors. Farmers will be able to arrange jointly, if necessary, for delivery of inputs to the village.

iv) Conveyance Efficiency.

Conveyance efficiency to the lower part of the watercourse is generally less than 40%. This can be measured by placing a flume at the mogha outlet and at the lower part of the watercourse. Pilot research projects have shown that earthen improvements can improve conveyance efficiencies to the end of most watercourses to over 70% with an increase in water to the field increasing from less than 50% to over 65% of mogha and tubewell supply.

v) Farm Size

In order to ensure distribution of benefits to small farmers these watercourse command areas will be selected where at least 75% of the farmers have holding under 25 acres. This would rule out watercourse command areas where there are only a few large land holders. Information of this type is available from land revenue records and can be provided by the village Lumberdars.

vi) Access to Markets.

To be selected, it must be demonstrated that the additional agricultural produce forthcoming from the improvement programme will have access to markets, whether through existing outlets or by new arrangements made by cooperating farmers or by new marketing factors.

vii) A Favourable Benefit-Cost Ratio.

Including both farmer contribution and the Government's share of costs.

E. Private Contractors and Levelling Equipment.

The role of the private contractor will be crucial to the success of the precision land levelling component of the Project. Contractors must be available to provide to farmers levelling services which meet the exacting standards required for irrigation efficiency. To encourage the development of private contractors the following program is proposed:

i) Tractor Power

The prime source of power for this project will be standard farm tractors (50-65 HP). It proposed to purchase 100 farm tractors which will be resold to eligible potential private contractors. The tractors will be sold on a 5 year contract with a minimum down payment of Rs.10,000. No principal payments will be required the first year and the interest rate will be 2%. The tractor will remain the property of the Government for the five year contract period, even though the total indebtedness is paid. The contractor must agree to utilize the tractor for not less than 50% of the time for precision land leveling and related work. If he does not fulfil his contract the bank will reclaim the tractor and return it to the Government. It may then be resold to another potential contractor. See table "Estimated Tractor Requirement for PLL" for total needs from all sources.

ii) Credit.

The National Bank of Pakistan will serve as collection agent for the Government on all private contractor loans. A small service fee will be deducted from the interest charges Collections will be deposited in a revolving fund and utilized for purchase of additional tractors for contractors establishment.

The bank will also provide credit to all contactors under their regular credit program for purchasing scrapers, levelers and other support equipment.

iii) Support Equipment.

Contractors will be encouraged to procure and maintain their own construction equipment. However, under the present on-going Precision Land leveling Project several pools of equipment have been established. It is expected that this equipment will be transferred to this loan project area or utilized in the training program.

As a part of the past, Precision Land Leveling project fabrication facilities were developed in Punjab and Sind. Five major firms produce land development and support equipment and are capable of meeting the requirements of this project. Other firms or branches are expected to assist with distribution and maintenance. The continuous supply of iron and steel products are a requirement for which the Government will make necessary arrangements.

F. Machinery and Equipment

i) Training Equipment

Presently there are six tractors available for training purposes with the Precision Land Levelling Project. Under the new project the scope of training has been enlarged. Therefore, sixteen additional tractors will be required. This also cover the replacement of old tractors over the project life. These tractors alongwith a range of equipment will be used for training of staff and tractor drivers. The training work will usually be on farmers fields near Lahore. Fields levelled or demonstration watercourses improved will be eligible for cost-sharing. Cooperating farmers will be charged accordingly. Charges will therefore be according to current estimated costs under the regular cost-sharing programme;

The list of all equipments for training and its estimated costs are given below:-

T A B L E 3 (a).

(IN ooo Rs.)

Training Equipment

Item.	1976-77	1977-78	1978-89	1979-80	1980-81	1981-82	Total.
Cost of 16 tractors @ Rs.70000/- each.	140.0(2)	210.0(3)	350.0(5)	-	420.0(6)	-	1120.0
6 Scrapers @ Rs.10500/-	21.0(2)	10.5(1)	31.5(3)	-	-	-	63.0
3 Land Levellers @ Rs.3300/- each.	6.6(2)	3.3(1)	-	-	-	-	9.9
2 Chiesel ploughs @ Rs.4000/- each.	4.0(1)	4.0(1)	-	-	-	-	8.0
4 Cultivators @ Rs.3500/-.	3.5(1)	10.5(3)	-	-	-	-	14.0
4 Seed Drills @ Rs.5000/- each.	5.0(1)	15.0(3)	-	-	-	-	20.0
3 Sets of border/ discs/ditchers @ Rs.7000/- each.	7.0(1)	14.0(2)	-	-	-	-	21.0
3 Trollies (2 wheels) @ Rs.12000/- each.	12.0(1)	24.0(2)	-	-	-	-	36.0
Sets of Tools	6.0	6.0	9.0	9.0	9.0	9.0	48.0
Total:	205.1	297.3	390.5	9.0	429.0	9.0	1339.9

(ii) Field Team Equipment

For necessary replacement and to cope with the enlarged physical targets necessary equipment and machinery is provided to the field teams in the project. Further to support and establish the precision land levelling work/operation a squard of private contractors would be set in. In this case a fleet of 100 tractors are provided in the project. These tractors will be given to the potential individuals on loan purchase basis. The detail of this service is already indicated earlier.

T A B L E - 3 (b)
in '000' Rs.

Field Team Equipment.

Item	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
50 Soil Scrapers @ Rs. 10,500 each.	-	63.0(6)	63.0(6)	105.0(10)	136.5(13)	157.5(15)	525.0
50 Lend Plane @ Rs. 3,300 each.	-	19.8(6)	19.8(6)	33.0(10)	42.9(13)	49.5(15)	165.0
10 Chiesel Plough @ Rs. 4,000 each.	-	4.0(1)	4.0(2)	8.0(2)	12.0(3)	12.0(3)	40.0
20 Border Disc @ Rs. 7,000 each.	-	14.0(2)	14.0(2)	28.0(4)	35.0(5)	42.0(6)	133.0
20 Ditcher @ Rs. 7,000 each.	-	14.0(2)	14.0(2)	28.0(4)	35.0(5)	42.0(6)	133.0
150 Syphen Tubes @ Rs. 2,000 each.	-	34.0(17)	34.0(17)	58.0(29)	80.0(40)	92.0(46)	298.0
40 Levellings instrumet sets @ Rs. 5,000 each.	-	25.0(5)	25.0(5)	40.0(8)	55.0(11)	60.0(12)	205.0
Total:-		173.8	173.8	300.0	396.4	455.0	1499.0

(iii) Rental Implement

It is proposed that all the equipment available under the Precision Land Levelling Project will be given on rent for different operations. The rental rates will be fixed by the Director Project. All such type of equipment will be placed at convenient points in project areas. The net rental amount will be kept in the personal ledger account of the Project Director in Government Treasury and shall be utilized towards maintenance repair and replacement of the equipment. All the equipment of the present PLLP will be transferred from the project and used in equipment rental pools.

iv) Vehicles.

In order to make the programme more effective adequate transport facilities at all level must be provided. The nature of the work demands mobility of the field workers, therefore officers will be provided with transport as below:-

T A B L E - 4

Organization/ Team.	Pickup/ Jeep/Mini-bus			Motorcycle			Tractor		
	Existing	New	Total	Exis-ting.	New	Total	Existing	New	Total.
Planning Cell	1	1	2	-	-	-	-	-	-
Provincial HQ.	1	1	2	1	-	1	-	-	-
Technical Training	2	2	4	5	-	5	6	16	22
With Agri:Univer-sity, Lyallpur.	-	1	1	-	-	-	-	-	-
Area Team(Four)	-	8	8	2	-	2	-	-	-
Field Team (Forty)	-	40	40	-	335	335	-	-	-
	4	53	57	8	335	343	6	16	22

Policy and Programme Framing Cell will undertake regular Field Survey and data collection work for project monitoring purposes. A comprehensive bench mark survey will also be done. This involves intensive touring of the staff. Two vehicles are provided. At Provincial Headquarter two vehicles are made available that will be used by the Project Director. Four vehicles have been provided for technical training centre. Out of these, two old and one new Mini-buses have been placed for carrying trainees on-the-job training and one pickup has been provided for conducting official duties by the technical Research and Training Staff.

One Mini-bus has been provided for Agricultural Officers(Ext.) who will be inparted training in Extension and water management techniques at Agriculture University, Lyallpur.

Four Area Teams have been proposed, each team has been provided with two jeeps. Similarly, for 40 Field Teams even number of Pickup have been provided. The purchase of 335 M/cycles has been included in the scheme. These motorcycles will be provided to the officers of the field teams under loan-purchase basis. The mileage allowance will be given as permissible under the rules while on official duty.

V) Accomodation.

In order to provide office buildings, lecture rooms and hostels for the trainees and staff residences a sum of Rs.217.82 lacs has been earmarked in the scheme. To start with rental buildings will be utilized for which necessary funds are also provided. Private buildings will be leased for Area and Field Teams camp offices according to the requirements. Necessary funds have been included.

G. Cost-Sharing

Pakistan's soil and water resources are the foundation of Agriculture. Proper use and management of these resources are essential to provide for their productive use on an infinite basis. The package of technology provided under this project is more or less new for the masses to accept without adequate incentive in the initial stages. The cost-sharing part of this project is a mean by which all of the people share in the cause of developing and conserving these valuable resources for individuals as well as country's benefits. The programme is designed to push through the pace of acceptence by the small farmers by sharing 50% cost by the Government in case of first 5 acres and the holding of 25 acres or less in Precision Land Levelling operations and about 60% in case of rehabilitation of watercourses in the form of material for all structures(Pakka Nakkas, Diversions, Drop Structures etc.). In the latter case 40% will be shared by the farmers in the form of manual labour. The rate of cost-sharing has been fixed on the current engineering cost estimates including cost of staff training material etc. (See Annexure 'E'). These rates will be adjusted after first evaluation of the Projects operations proposed to be made after the expiry of first two years of the Project.

The cost-sharing arrangements work out in the light of physical targets for PLL and watercourse improvement is as follows:

TABLE - 5
(DISTRIBUTION OF COST SHARING FUNDS(lacs Rs)

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
I. PRECISION LAND LEVELLING (physical Targets in Acres)							
A. Total Targets (in 000 acres).	1	18	35	55	65	76	250.0
Distribution of Targets on 80% & 20% basis.							
N.B.I.							
a) With Cost Sharing 80%	0.8	14.4	28.0	44.0	52.0	60.8	200.0
b) Without Cost Sharing (20%).	0.2	3.6	7.0	11.0	13.0	15.2	50.0
B) Breakup of Cost Sharing amount @ Rs.670/- per acre on 50:50 basis 80% area)							
i) Govt. Share (in lacs Rs).	2.68	48.24	93.80	147.40	174.20	203.68	670.00
ii) Farmers Share (in lacs Rs.)	2.68	48.24	93.80	147.40	174.20	203.68	670.00
C) Without Cost Sharing (20% area) @ Rs.670/- per acre.	1.34	24.12	46.90	73.70	87.10	101.84	335.00
Total(B&C)	6.70	120.60	234.50	368.50	435.50	509.20	1675.00
II. WATERCOURSE DEVELOPMENT. (Physical Targets in Nos.)	5	70	120	185	250	270	900
Breakup of Cost-Sharing amount for watercourse devel. (on 60:40 basis by the Govt. and Farmers) (Lacs Rs.).							
i) BY GOVERNMENT:							
a) Cost of lining (N.B.2) 50% of 1600 Rft @ Rs. 30 per ft. for material equal Rs.24000/- per watercourse.	1.20	16.80	28.80	44.40	60.00	64.80	216.00
b) Watercourse structures and material (e.g, Culverts; Nakkas etc). @ Rs.26000/- per water-course. Including 3 buffaloes Crossing @ Rs. 6000 each per water course.	1.30	18.20	31.20	48.10	65.00	70.20	234.00
Sub.Total:	2.50	35.00	60.00	92.50	125.00	135.00	450.00
ii) BY FARMERS(MANNUAL LABOUR) (40% of (i) of actual material cost	1.00	14.00	24.00	37.00	50.00	54.00	180.00

N.B.1 This ratio has been based on past experience and facts as recorded under PLLP's field operation.

N.B.2. The lining work will be undertaken on selected points on a watercourse, where soil profile is not compacted or having seepage due to sand or porous soil, over a road crossing or near the villages etc.

H. Follow up maintenance.

Once the operation of Precision Land Levelling on a particular field is completed, it is also necessary to undertake follow-up minor levelling work in the respective field after 2-3 cropping.

Similarly in case of water courses minor earth work patch-up, removal of grasses and casual desilation are required. Both above operations require same expenditures which will be incurred by the farmers mutually through the Water Users Association. The detail of the expenditure is as follows:-

TABLE - 5 (A)

S. No.	Operation	Rate/unit in rupees	Total amount in rupees.
1.	Land levelling of 2,50,000 acres	20/Acres	50,00,000
2.	Water courses (900) each of 16,000 ft length.	0.15/ft	21,60,000
		Total:	71,60,000

The above indicated expenditure isnot depicted in the Project Cost but will be borne by the beneficiaries; whereas it is accounted for while working B/C ratio.

I. Worker Incentive Programme.

It is proposed to establish an incentive programme for field workers. A bonus will be paid to workers who exceed normal production goals. Experience to date indicates under average conditions a field worker can provide technical assistance to farmers in levelling 60 acres per quarter. A bonus will be paid to workers who exceed these goals as follows:-

i) Over 60 acres and up to 75 acres. Rs.10/acres.
ii) Over 75 acrs. Rs.15/acres.

A smilar incentive programme will be proposed for watercourse improvement as soon as enough experience is gained to establish normal production rates.

13. SUMMARY OF CAPITAL:

Capital cost covering whole of the investiment period is indicated below:-

i) Machinery and Equipment.

TABLE - 6

	Local	F.E.C.	Import	Total
		(in 000 Rs)		
a. Tractor and Equipment for training.	1472,9	-	-	1472.9
b. Tractor for private contractors.	7000.0	-	-	7000.0
c. Surveying Equipment.	590.0	-	-	590.0
d. Jeeps and Pickups.	5860.0	2000.0	-	7860.0
e. Motor Cycles.	3350.0	-	-	3350.0
f. Duplicating Machine.	83.0	-	-	83.0
g. Calculator.	20.0	-	-	20.0
h. Supporting Equipment, Syphon tubes and Photographic material.	2098.0	-	-	2098.0
i. Type writers.	260.0	-	-	260.0
j. Cost of Buildings for training Centre etc.	4600.0	-	-	4600.0
k. Furniture.	388.0	-	-	388.0

14. BASIS OF COST ESTIMATES.

Prevailing market rates and the findings recorded under water Management Project and Precision Land Levelling Project.

15. ANNUAL OPERATIONAL COST AFTER COMPLETTON OF PROJECT.

	Local	F.E.C.	Total
	in '000' Rs.		
Salaries and Allowance.	6777.2	-	6777.2
Material Consumable stores.	38516.7	-	38516.7
contingencies.	45293.9		45293.9

16. UNIT COST OF EACH CATEGORY OF SERVICE e.g. COST PER DEMONSTRATION FARM COST PER ONE THOUSAND POPULATION COVERED.

The project includes training-cum-intitutional building programme. Therefore, the direct beneficiaries would be less in number. They include the farmers on which field/land the precision land levelling and watercourse improvement operation will be undertaken during the project life.

Approximately the per unit cost worked out is as given below:

Total number of beneficiaries = 85 thousands

Cost per Unit/farmer Rs.1900.60 ÷ .85 = 2236

17. IF ANY INCOME WILL ACCRUE GIVE ESTIMATE OF ANNUAL INCOME AND BASIS FOR CALCULATION.

The project will have both tangible and intangible benefits/returns. But it cannot be exactly quantified because in the initial stages the project activities are mostly restricted to training of different types of technician and laying out infrastructure for the subsequent project operations. Accordingly the direct income will be obtained from the project by hiring out levelling implements for precision land levelling operations and income from sale of tractors to the private cantractors. Recovery in cash as motorcycle repayment money can also be realized from the project staff.

Moreover, it is worth while to indicate that the direct [illegible]

the Government can only be visualized through enhanced water rates. Otherwise, the farmers and the rural labour are supposed to be major receipients of the intangible benefits in the form of increase incomes due to higher productivity and increased internal capital formation at the farm levels. The building up of infrastructural facilities will have some long term benefits/returns diffused through the whole economy of the area.

It is expected that through the package deal provided in the project, annual income through increased and improved cropping activity would range between Rs.34,600 to Rs.1,38,000 per command area. Further, the level of incremental income, however, will greatly depend upon the effectiveness of the extension services including the supply of other inputs well in time. In case, if the farmers quickly learn the improved methods crop and water management, the benefit stream will be much larger.

18. BENEFITS/COST RATIO

The project aims to ensure enhanced water supply and increased agricultural productivity through different elements of the programme. The farmers of the command area and rural labour would be the major receipient of the increased income. Besides, its direct contribution on crop production, the project will have a spillover impact on the rural economy of the project areas in the form of generating sizeable employment opportunities for the professinals, para-professionals skilled and unskilled labour. During the course of six years the project would provide employment to about 250-325 agricultural graduate and 210-250 field assistants type para professionals.

Most of the labour for watercourse improvement work will be contributed by the farmers themselves and is estimated at 1000 mandays (3 man years) per watercourse command area. For land levelling most of the equipment, to be used in the project are to be locally manufactured. It is estimated that this programme will be require locally produced equipment worth Rs. 20 million.

While working out the B/C ratio, the life of the project is taken as six years. The opportunity cost of the capital is considered as 12%. The follow-up maintenance expenditure are also incorporated in the cost stream of the project (Annexure 'F')

Present value of Project :-

Benefits	:	1439.66 (lacs rupees)
Costs	:	925.77 (lacs rupees)
Benefit cost ratio:		1 : 1.56

The benefits derived from this project are worked out by actually determining the impact of this technology in saving the available water supplies and putting it for productive uses for crop production in and around watercourse command areas. Moreover, the Precision Land Levelling and Water Management extension work is also lead to increase the agriculture

productivity to mainfold. The water saved has been assigned its scarcity value as ascertained in a recent study (appended as annexure 'C').

19. ANNUAL PLANNING OF PHYSICAL WORK AND FINANCIAL REQUIREMENTS FOR THE PROJECT.

The distribution of physical targets over the Project life is as under:-

T A B L E - 7

PHYSICAL TARGETS REGARDING ON FARM WATER MANAGEMENT PROJECT.

Description.	1976-77	1977-78	1978-79	197980	1980-81	1981-82	Total.
1. No. of Field Teams.(progressive total).	5	10	15	25	35	40	40
2. No. of Watercourse Developed.	5	70	120	185	250	270	900
3. Precision Land Levelling.							
a. Watercourse command area(60%).	600	9,000	15,600	24,000	28,200	34,800	1,12,200
b. Outside of watercourse area(40%).	400	6,000	10,400	16,000	18,800	23,200	74,800
c. By private contractors.	-	3,000	9,000	15,000	18,000	18,000	63,000
Total (a+b+c)	1,000	18,000	35,000	55,000	65,000	76,000	2,50,000

P A R T - C

PROJECT REQUIREMENT

T A B L E - 8

20. MANPOWER	For Execution (Man Month)	For operation (Number)
1. Professional & Technical	29664	412
2. Administrative Executive & Managerial.	144	2
3. Clerical.	11160	155
4. Skilled.	6048	84
5. Un-skilled.	30888	429
6. Foreign consultant.	288	4

Likely shortage of man-power by occupation and indicate steps which should be taken to assure availability of man power.

There is a shortage of technical staff especial Agriculture engineering graduate. Demand is exceeding the supply for these graduates because number of parallel Programme/Project are intact by WAPDA & other nation building departments. Anyhow attempts will be made over come such difficulties by accommodating Diploma holder after given required training at the training institute.

All the personnel who have been trained previously on the precision land levelling project will be transferred by July,1, 1976 to the "On-Farm Water Management Project" in order to help overcome the critical need of trained man power in the early years of the Project. Also to ensure availability of man power to the programme in the future, all personnel required for the project (both at the Provincial level and in the field) will be made permanent members of the Agriculture Department.

Staff training and development of institutional capability are basic and extremely important requirements of the project to ensure that adequate trained man power is available. Intensive training programme will, therefore, be established to provide the field staff with adequate knowledge, skills and expertise to carry out the programme.

Four U.S. consultants will be provided by US AID with grant funds from July, 1976 to March, 1980 (4 years). Two of these (the Team Leader and Agriculture Economist) will coordinate the country programme, but will work out of Lahore. The other two will be an Irrigation Agronomist and Irrigation Engineer and are assigned full time to the Punjab. Budget does not include US AID centrally funded project for water management research supported by Colorado State University. Approximately one additional man year will be provided from continued research.

21.	PHYSICAL AND ALL OTHER FACILITIES REQUIRED FOR THE PROJECT.	Annexure 'F' attached.
22.	MATERIAL, SUPPLIES AND EQUIPMENT.	See item 13.
23.	IN CASE OF IMPORTED MATERIALS OR EQUIPMENT FOR EXECUTION INDICATE.	Most of the machinery and equipment needed in the project will be procured in local currency. Further it is expected that the equipment now available in the existing projects (surveying kits, land plan, soil scrapers etc, will be transferred to this project.

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ANNEXURE 'A'

WORK PLAN FOR BENCH-MARK SURVEY

In this project our endeavour is to evaluate the existing socio-economic structure and agricultural pattern in the project areas. The prime objective is to develop a data base for framing out various development programmes/policies, and targets of different activities under the scheme entitled as "On-Farm Water Management Development Project". This will be done by conducting sample surveys in different p geophysical regions/sites representing each area, namely SCARP and NON-SCARP, sandy areas and low and high salt contents of underground water.

While preparing PC-1 proforma of the scheme this issue was observed that serious"information and data gaps" exist about socio-economic condition of the project areas. Especially there is no statistics available about number of watercourses, command areas, water use efficiency under different soil conditions, crop production pattern, extent of water losses in actual farmers watercourses etc. To overcome such difficulties and to develop a preliminary data base a field survey will be undertaken.

A tentative methodology for the survey is outlined as follows:-

1. To cover various geophysical and crop production conditions the whole universe (7 tehsils) will be divided into three regions as specified earlier for the selection of villages and for interviewing farmer respondents.
2. One percent villages from each region will be randomly selected.
3. About 600 farmers in total (200 from each region) would be selected by random sampling technique giving due consideration for various size of holdings types of irrigation, ownership status in and outside watercourse command areas.

4. Bench Mark Survey questionnaire and detail work plan would be finalized after due consultation with all the concerned agencies and experts.
5. Farmers would be interviewed by a team of workers. Necessary training would be imparted before the survey is started.
6. Editing work would be done by the Team Leader and the Field Supervisor.
7. Analysis and compilation work would be executed by the staff of Planning and Evaluation Cell. Possibilities may also be explored to undertake computer help for data analysis.

In addition to detail survey as mentioned above, basic information about the villages watercourse command areas, farm labour, village amenities, land use pattern, water supply etc., may also be collected for future reference.

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MAP OF THE PROJECT AREA

ANNEXURE 'B'

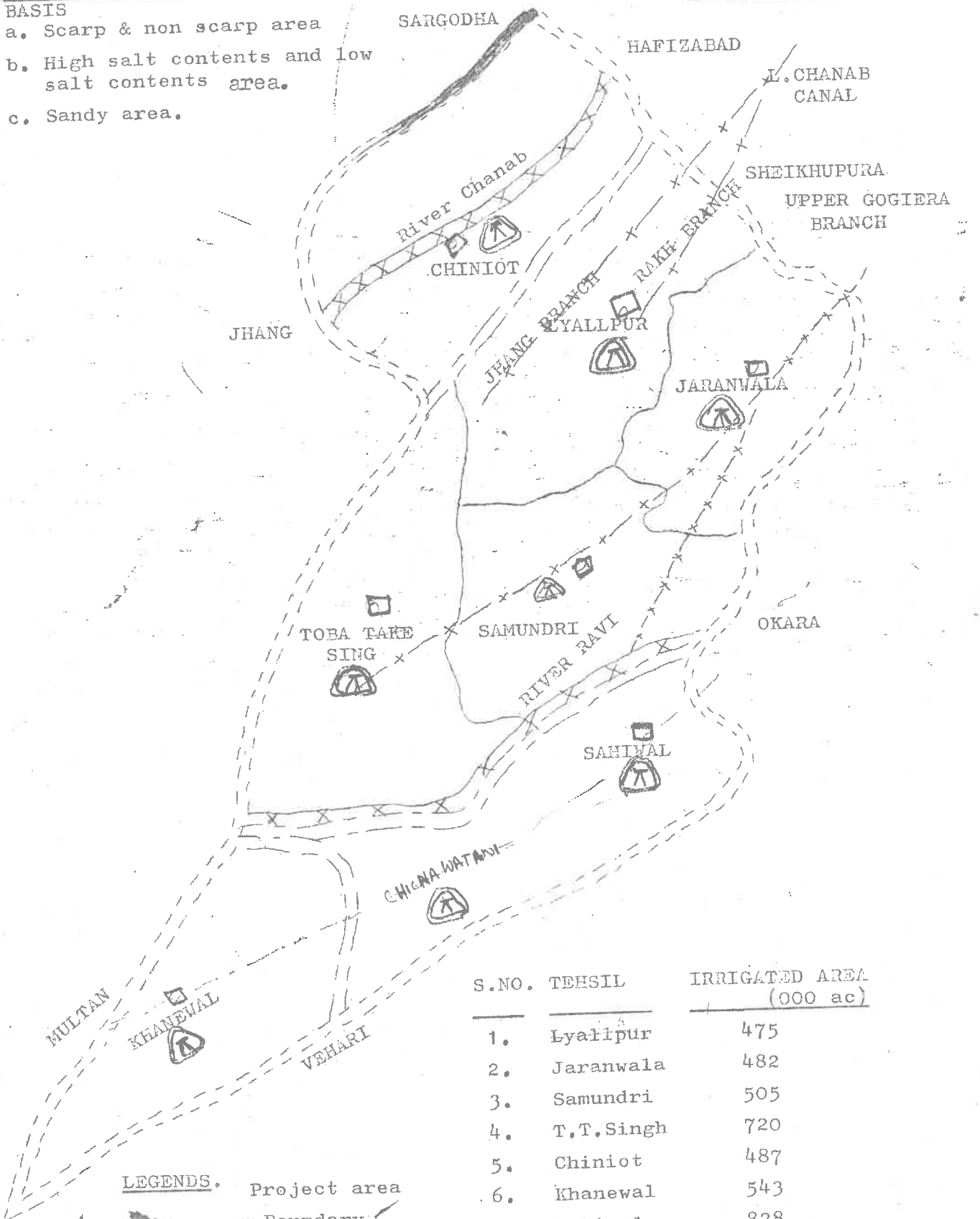
SELECTION CRITERIA.

BASIS

a. Scarp & non scarp area

b. High salt contents and low salt contents area.

c. Sandy area.



S.NO.	TEHSIL	IRRIGATED AREA (000 ac)
1.	Lyallpur	475
2.	Jaranwala	482
3.	Samundri	505
4.	T.T.Singh	720
5.	Chiniot	487
6.	Khanewal	543
7.	Sahiwal	828
	Total	4040

LEGENDS.

1. Project area Boundary
2. Teh;area Boundary
3. Tehsil Headquarter
4. Canal — Field Team Head Quarter
5. River
6. ~~District Boundary~~

Annexure 'C'

ON

ECONOMIC IMPACT WATERCOURSE IMPROVEMENT

Watercourse is an important link in the canal irrigation system that carries water from the mogha to the farmer's fields. Extensive research studies on 22 representative watercourse in 7 districts of Punjab show that the watercourse are improperly designed, improperly operated and poorly maintained with the result that a considerable amount of the already inadequate water supply does not reach the farmers' fields. Tremendous amount of losses in watercourses mainly due to spillage viz, over topping of watercourse banks and leakage from poorly maintained nakkas on the sub branches of watercourses and frequent cuts in the main watercourse, result in 80 percent of the total watercourse losses while seepage losses contribute only to 20%.

DELIVERY EFFICIENCY SUMMARY STATISTICS IN PUNJAB SHOWING WATERCOURSE LOSSES

S.No	Districts	Site	No of Watercourses studied.	Length of Watercourse.	Delivery Efficiency.
1.	Lahore	Shadab			
		a) Kanjra	1	4,400 ft	62.51
		b) Maraka	1	2,000 "	58.0
		c) Khamba	3	3,200 "	61.7
2.	Multan	a) Lar	1	3,600 "	64.2
		b) Risala	3	13,300 "	57.3
3.	Lyallpur	Dialgah	2	7,000 "	68.2
4.	Gujranwala	Harpoke	2	6,500 "	57.9
5.	Muzaffar Ghar	Muza Moud	2	4,500 "	47.0
6.	Bahawalpur	Muza Kakkin	4	3,200 "	66.0

The overall delivery efficiency from all the 19 watercourse studies cam.60.3%. The estimated before and after improvement average delivery efficiencies for lining + katcha and Katcha improvement are as follow:

Case	Existing Del.efficiency	Estimated Del.efficiency (after improvement)
a) Lining	60.0%	95.0%
b) Lining 5% + Katcha Improvement 95%	60.0%	90.0%
c) Katcha Improvement 100%	60.0%	85.0%

Taking an average watercourse length as 30'/acre on a watercourse having command area of 550 acres with 2 cusecs of outlet flow, the canal supply for 325 days/year, the water saving under different improvement alternatives would be as:-

a. Lining — 35% of initial flow.
b. Lining + Katcha Improvement — 30% -do-
c. Katcha Improvement — 25% -do-

With the above available information, the benefit cost ratio is calculated as follow:-

I. BENEFITS ASSOCIATED WITH EACH ALTERNATIVE.

Alternative	Saving of water/ Year(in acre ft)	Value of acre ft. (Rs.)	Saving/year (Rs.)
a. Lining	455.0	300/-	136500.0
b. Lining + Katcha Improvement	390.0	300/-	117000.0
c. Katcha Improvement only	325.0	300/-	97500.0

II. COST ASSOCIATED WITH EACH ALTERNATIVE.

Alternative	Length of Watercourse ft.	Cost/ft. (Rs.)	Total cost (Rs.)
a. Lining	16000.0	40.0	64,00,000.0
b. Lining + Katcha Improvement	800	40.0	
	15200.0	2.5	70,000.0
c. Katcha Improvement	16000.0	2.5	40,000.0

III. BENEFIT COST RATIOS.

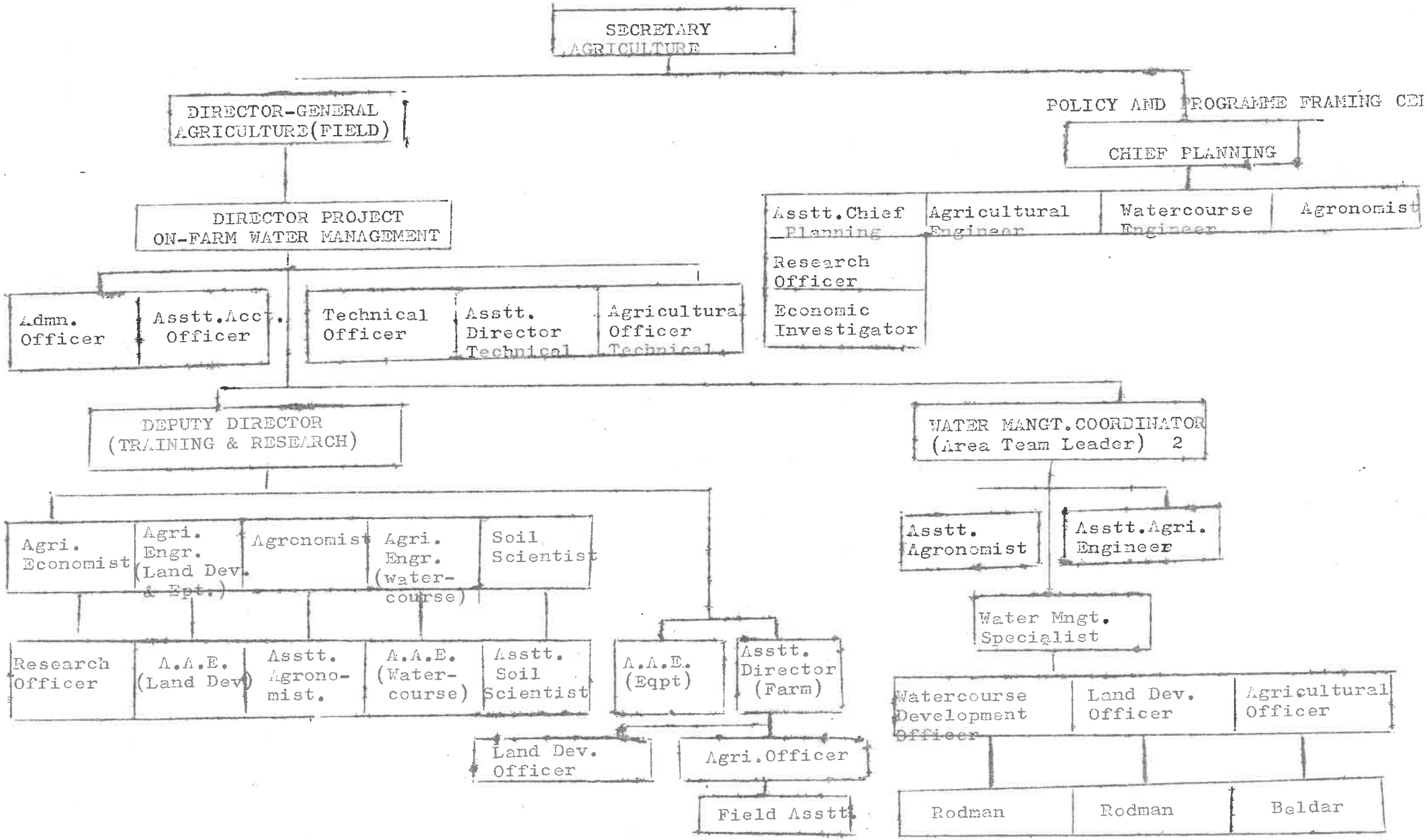
Alternative	Benefit Cost.
a. Lining	0.21
b. Lining + Katcha Improvement	1.67
c. Katcha Improvement	2.44

The results of benefit cost analysis for the alternatives watercourse improvement suggest the lining the whole watercour

system is not feasible whereas a combination of lining and katcha improvement is an acceptable alternative. The 100% katcha improvement alternative gives the better and attractive benefit cost ratio, but in this case the continuous maintenance is assumed as permanent factor. The Combined Lining and Katcha Improvement Alternative would be considered in a situation where there is some patches of sandy or permeable soils or lining that section of watercourse where losses occure the most and the remaining part should come under katcha improvement. Where the soils are heavy textured, the 100% katcha improvement would be the best alternative.

ANNEXURE 'D'

ORGANIZATIONAL CHART
ON-FARM WATER MANAGEMENT DEVELOPMENT PROJECT



ANNEXURE 'E'

SUMMARY AND ANALY IS
PRECISION LAND LEVELLING COST DATA

Job No.	Acres.	Total Cut (m^3)	m^3/AC	EQUIPMENT HOURS Tractor	Scraper	Other	m^3/HR	Rs./m^3 1/	AC/Day
1	5.0	380	76	30	25	5	12.67	2.93	1.33
2.	2.34	828	354	60	57	3	13.80	2.65	0.31
3	4.7	420	89	30	27	3	14.00	2.65	1.25
4	6.7	1454	240	104	98	6	13.98	2.60	0.47
5	6.0.	1124	187	93	85	8	12.09	3.05	0.52
6	6.0	1526	254	118	110	8	12.93	2.83	0.41
7	5.0	1655	331	108	100	8	15.32	2.41	0.37
8	3.31	560	170	45	40	5	12.44	2.93	0.59
Total	38.42	7947	-	588	542	46	-	-	-
Range.	2.34-6.07	-	76-354	-	-	-	12.09-15.32	2.41-3.05	0.31-1.33
Average.		-	207 2/ (Say 200)	-	-	-	13.52	2.72 2/ (Say 3.00)	0.52

1/ Costs based on:Tractor, Rs.35/Hr.; Scraper, Rs.15/Day; Landplane, Rs.5/Day; and Other Rs.15/day used 8 Hr days.

2/ Average Cost of Land Levelling Job/Acre.

i) Operational Cost = 200xRs.3.00 = Rs.600.00

ii) Estt:Training & Material Cost etc = = Rs. 97.00

Total Cost/acre. = Rs.697.00

ANNEXTURE- F/I

ECONOMIC ANALYSIS

Part-I

This scheme calls for the improvement of 900 watercourses with a command area of 4,50,000 acres. In addition to watercurse improvement precision land levelling will be practiced on 250,000 acres. In addition to the physical improvement of the watercourses and the levelling of the land the project provides for trained agricultural graduates to assist the farmers in application of improved technology including seeds varieties, fertilization, cultural practices and improved irrigation water management. Benefits will flow from two sources, increased yield through better farming practices and increased area irrigated from water saved. Full benefits will not be realized until the last year 1982 of the scheme. However, benefits will be received on a proportional basis to work completed as the project is installed. Project costs are as shown in this PC-I, and include both Government financed cost and the value of farmer furnished inputs required for this scheme. Project benefits have been calculated as follows:-

1. Command area of 900 watercourses is 4,50,000 acres.
2. The intensity of cropping in the common area presently is 0.95 lakh acres of wheat receiving full irrigation in Rabi season, .43 lac acres of cotton and .22 lac acres of maize receiving full irrigation during Kharif season. The volume of production of vegetable and forage crops is expected to remain relatively constant.
3. Water saving from watercourse improvement is estimated at 30 percent. This will allow the full irrigation of an added .39 lakh acres of wheat, .17 lakh acres of cotton and .09 lakh acres of maize in the command area of these watercumses.
4. Water saving on the 2.5 lakh acres to be levelled is estimated at 20 percent. This will permit the irrigation of .50 lakh acres of wheat, .22 lakh acres of cotton and .11 lakh acres of maize.

PART II YIELD AND WATER EFFICIENCY

(a) YIELD

CROP	WITHOUT	WITH
WHEAT	17 Mds	25.5 Mds
COTTON	10.5 Mds	15.7 Mds
MAIZE	14.8 Mds	22.2 Mds

(b) WATER EFFICIENCY

	WITHOUT	WITH PLL	WITH WC	WITH PLL+ WC
DELIVERY	60 %	60 %	90 %	90 %
FIELD	60 %	80 %	60 %	80 %

(c) ACREAGE AND WATER SUPPLY

COMMAND AREA	500 ACRES
OUTLET FLOW	2 CUSEC
DAY/YEAR	325
VOLUME OF WATER	1300 Ac Ft

(d) IRRIGATION REQUIREMENT(PEAK SEASON)

KHARIF	.30 INCHES PER DAY
RABI	.20 INCHES PER DAY

(e) IRRIGATED ACREAGE PER WATERCOURSE

	WITHOUT	WITH WC-I
KHARIF	57.6 Ac	86.4 Ac
RABI	86.4 Ac	129.6 Ac

PART III A. INCREASED NET INCOME PER WATERCOURSE

FROM INCREASED YIELD

WHEAT	86.4 Ac at Rs. 30	19780
COTTON	38 Ac at Rs.390	14820
MAIZE	19.6 Ac at Rs.220	4312
		38912

FROM INCREASED ACREAGE

WHEAT	43.2 Ac at Rs. 480	20736
COTTON	19.2 Ac at Rs. 870	16704
MAIZE	9.6 Ac at Rs. 340	3264
		40704
	Total:-	79616

B- INCREASED NET INCOME PER LEVELED

FROM INCREASED YIELD

WHEAT	.83 Ac at Rs. 230	190.90
COTTON	.33 Ac at Rs. 390	128.70
MAIZE	.17 Ac at Rs. 220	37.40
		357.00

FROM INCREASED ACREAGE

WHEAT	.16 Ac at Rs. 480	76.80
COTTON	.10 Ac at Rs. 870	87.00
MAIZE	.06 Ac at Rs. 340	20.40
		184.20
	Total:-	541.20

PART IV

EVALUATION:PRESENT ANNUAL VALUE OF COSTS AND BENEFITS

A. A six year life has been used for watercourse and leveled land.

B. An interest of 12 percent was used.

C. Maintenance has been included at:-

Rs.20 per acre leveled

Rs.0.15 per foot of watercourse.

FIRST YEAR

A. Benefit

Watercourses (5 at Rs. 79616)	398,080
Land leveled(1000 ac at Rs. 541.20)	541,200
Total	939,280

B. Capital cost

Watercourses(5 at Rs.70000 X .24323)	85130
Land leveled(1000 ac at Rs.600 X .24323)	145938
	Rs. 231,068

C. Maintenance cost

Watercourses(5 at Rs. 2400)	12000
Land leveled(1000 at Rs. 20)	20000
	32000
Total	Rs: 263068

2nd Year

A. Benefit	
Watercourses (70 at Rs. 79616)	5,573,120
Land leveled(18000 at Rs. 541.20)	9,741,600
	15,314,720
Discounted for lag(15,314,720 X .89286)	13,673,900
B. Capital cost	
Watercourses (70 at Rs. 70,000 X. 24323)	1,191,827
Land leveled(18000 at Rs. 600 X .24323)	2,626,884
	3,818,711
C. Maintenance cost	
Watercourse(70 at Rs. 2400)	168,000
Land leveled(18000 at Rs.20)	360,000
	528,000
Total	4,346,711
Discounted for lag(4,346,711 X.89286)	3,881,004

3rd Year

A. Benefit	
Watercourses(120 at Rs. 79616)	9,553,920
Land leveled(35000 at Rs. 541.20)	18,942,000
	28,495,920
Discounted for lag(28,495,920 X.79719)	22,716,662
B. Capital costs	
Watercourses(120 at Rs.70000 X .24323)	2,043,132
Land leveled(35,000 at Rs. 600 X .24323)	5,107,830
	7,150,962
C. Maintenance cost	
Watercourses (120 at Rs. 2400)	288,000
Land leveled(35000 at Rs. 20)	700,000
	988,000
Total	8,138,692
Discounted for lag(8,138,962 X. 79719)	6,488,299

4th Year

A. Benefits

Watercourses(185 at Rs. 79616)	14,728,960
Land leveled(55000 at Rs. 541.20)	29,766,000
	44,494,960
Discounted for lag(44,494,960 X .71178)	31,670,622

B. Capital costs

Watercourses (185 at Rs.70,000 X .24323)	3,149,828
Land leveled(55,000 at Rs. 600 X . 24323)	8,026,590
	11,176,418

C. Maintenance costs

Watercourses (185 at Rs.2400)	444,000
Land leveled(55,000 at Rs. 20)	1,110,000
	1,554,000
Total	12,720,418
Discounted for lag(12,720,418 X .71178)	9,054,139

5th Year

A. Benefits

Watercourses (250 at Rs. 79616)	19,904,000
Land leveled(65000 at Rs. 541.20)	35,178,000
	55,082,000
Discounted for lag(55,082,000 X. 63552)	35,005,606

B. Capital costs

Watercourses (250 at Rs.70,000 X .24323)	4,256,525
Land leveled(65000 at Rs. 600 X .24323)	9,485,970
	13,742,495

C. Maintenance cost

Watercourses(250 at R_s.2400)	600,000
Land leveled(65000 at Rs.20)	1,300,000
	1,900,000
Total:-	15,642,495
Discounted for lag(15,642,495 X .63552)	9,941,118

6th Year

A. Benefits

Watercourse(270 at Rs.79616)	21496320
Land leveled(76,000 at Rs. 541.20)	41131200
	62,627,520
Discounted for lag(62,627,520 X .50663)	31,729,050

B. Capital costs

Watercourses(270 at Rs.70,000 X .24323)	4,597,047
Land leveled(76000 at Rs. 600 X .24323)	11,091,288
	15,688,335

C. Maintenance cost

Watercurses(270 at Rs.2400)	648,000
Land leveled(76000 at Rs.20)	1,520,000
	2,168,000
Total:-	17,856,335
Discounted for lag(17,856,335 X .50663)	9,046,555

Overhead costs: PC-I	Cost sharing PLL and WC	Equipment for sale	Net cost
1976-77 3,682,860	518,000		3,164,860
1977-78 39,799,207	8,324,000	3,500,000	27,975,207
1978-79 24,169,141	15,380,000	1,750,000	7,039,141
1979-80 35,250,894	23,990,000	1,750,000	9,510,894
1980-81 41,870,403	29,920,000		11,950,403
1981-82 45,293,957	33,868,000		11,425,957

Other Income(Sales)

	Tractors	Motorcycles	Net Income
1976-77		400,000	400,000
1977-78	3,500,000	450,000	3,950,000
1978-79	1,750,000	450,000	2,200,000
1979-80	1,750,000	800,000	2,550,000
1980-81		800,000	800,000
1981-82		450,000	450,000

OVERHEAD COST AND OTHER INCOME DISCOUNTED FOR LAG

	Factor	Actual cost	Discounted cost	Actual Income	Discounted Income
1976-77	1.	3,164,860	3,164,860	400,000	400,000
1977-78	.89268	27,975,207	24,972,907	3,950,000	3,526,086
1978-79	.79719	7,039,141	5,611,532	2,200,000	1,753,818
1979-80	.71178	9,510,894	6,769,664	2,550,000	1,815,039
1980-81	.63552	11,950,403	7,594,720	800,000	508,416
1981-82	.50663	11,425,957	5,788,732	450,000	227,983
	Sub-total		53,902,415		8,231,342

LAND LEVELING AND WATERCOURSE IMPROVEMENT

	Discounted cost	Discounted benefit
1976-77	263,068	939,280
1977-78	3,881,004	13,673,900
1978-79	6,488,299	22,716,662
1979-80	9,054,139	31,670,622
1980-81	9,941,118	35,005,606
1981-82	9,046,555	31,729,050
Subtotal:-	38,674,183	135,735,120
Total	92,576,598	143,966,462

Cost benefit Ratio: 1:1.56

COST ESTIMATE OF THE SCHEME REGARDING ON-FARM WATER MANAGEMENT DEVELOPMENT PROJECT IN THE PUNJAB 1976-77 TO 1981-82

(I) POLICY AND PROGRAMME FRAMING CELL (WITH SECRETARY AGRICULTURE)

STAFF

A.PAY OF OFFICERS.	Posts	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
1. Chief Planning (NPS-19)	1	10,800	22,560	23,520	24,480	25,440	26,400	1,33,200
2. Assistant Chief Planning(NPS-18)	1	9,000	12,900	13,800	14,700	15,600	16,500	82,500
3. Agricultural Engineer (NPS-18)	1	9,000	12,900	13,800	14,700	15,600	16,500	82,500
4. Watercourse Engineer (NPS-18)	1	6,000	12,900	13,800	14,700	15,600	16,500	79,500
5. Agronomist(NPS-18)	1	6,000	12,900	13,800	14,700	15,600	16,500	79,500
6. Research Officer (NPS-17)	4	12,000	26,400	28,800	31,200	33,600	36,000	1,68,000
7. Economic Investigators (NPS-16)	4	9,600	20,880	22,560	24,240	25,920	27,600	1,30,800
Total:-		62,400	1,21,440	1,30,080	1,38,720	1,47,360	1,56,000	7,56,000

B. PAY OF ESTABLISHMENT.	Posts	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
1. Superintendent (NPS-11)	1	-	3,300	3,540	3,780	4,020	4,260	18,900
2. Computer (NPS-11)	2	3,300	7,080	7,560	8,040	8,520	9,000	43,500
3. Office Assistant (NPS-10)	2	4,500	6,432	6,864	7,296	7,728	8,160	40,980
4. Senior Scale Stenographer (NPS-12)	1	2,250	3,600	3,840	4,080	4,320	4,560	22,650
5. Stenotypist(NPS-8)	4	7,200	10,176	10,752	11,328	11,904	12,480	63,840
6. Senior Clerk(NPS-6)	2	-	3,960	4,152	4,344	4,536	4,728	21,720
7. Junior Clerk(NPS-5)	3	4,050	5,616	5,832	6,048	6,264	6,480	34,290
8. Driver (NPS-3)	1	1,080	2,916(2)	2,988(2)	3,060(2)	3,132(2)	3,204(2)	16,380
9. Daftari(NPS-2)	1	990	1,356	1,392	1,428	1,464	1,500	8,130
10. Peons(NPS-1)	6	5,400	7,344	7,488	7,632	7,776	7,920	43,560
11. Chowkidar (NPS-1)	1	900	1,224	1,248	1,272	1,296	1,320	7,260
12. Sweeper(NPS-1)	1	900	1,224	1,248	1,272	1,296	1,320	7,260
Total:-		30,570	54,228	56,904	59,580	62,256	64,932	3,28,470
C. OTHER ALLOWANCES AND HONORARIA.								
1. Other Allowances.								
Officers.		33,840	48,570	52,032	55,488	58,944	62,400	3,11,274
Establishment		19,260	33,400	35,028	36,655	38,282	39,909	2,02,534
Total.		53,100	81,970	87,060	92,143	97,226	1,02,309	5,13,808
2. Travelling Allowance.								
Officers.		10,000	40,000	45,000	45,000	45,000	45,000	2,30,000
Establishment.		1,000	13,000	13,000	13,000	13,000	13,000	66,000
Total (1 & 2)		11,000	53,000	58,000	58,000	58,000	58,000	2,96,000
Total (1 & 2)		64,100	1,34,970	1,45,060	1,50,143	1,55,226	1,60,309	8,09,808

D. CONTINGENCIES.	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
(a) Non-Recurring.							
1. Type Writers.	-	20,000	-	-	-	-	20,000
2. Calculators.	-	10,000	-	-	-	-	10,000
3. Duplicating Machine	14,000	-	-	-	-	-	14,000
4. Furniture	15,000	10,000	-	-	-	-	25,000
5. Telephone Installation.	3,000	2,000	-	-	-	-	5,000
6. Jeep (One)	-	90,000	-	-	-	-	90,000
7. Photostat Machine.	-	20,000	-	-	-	-	20,000
Total:-	32,000	1,52,000	-	-	-	-	1,84,000
B. RECURRING:							
1. P.O.L Charges.	10,000	50,000	50,000	50,000	50,000	54,000	2,64,000
2. Repair and spare.	4,000	20,000	24,000	30,000	30,000	32,000	1,40,000
3. Service stamps/ stationery.	3,000	12,000	15,000	20,000	20,000	20,000	90,000
4, Publicity/documentation etc.	3,000	17,000	20,000	20,000	20,000	20,000	1,00,000
5, Rent,rate and taxes.	30,000	36,000	42,000	42,000	42,000	42,000	2,34,000
6. Telephon charges.	10,000	40,000	50,000	60,000	60,000	60,000	2,80,000
7. Electricity.	4,000	8,000	10,000	10,000	10,000	10,000	52,000
8. Liveries.	800	1,000	3,000	3,000	3,000	5,000	15,800
9. Hot and cold weather Charges.	3,000	6,000	6,000	6,000	8,000	8,000	37,000
10. Other Contingencies.	3,000	15,000	15,000	15,000	20,000	20,000	88,000
Total Recurring.	70,800	2,05,000	2,35,000	2,56,000	2,63,000	2,71,000	13,00,800
Total (a + b)	1,02,800	3,57,000	2,35,000	2,56,000	2,63,000	2,71,000	14,84,800

(E) SUMMARY OF THE EXPENDITURE (POLICY CELL)

1. PAY AND ALLOWANCE.	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
a) Pay of Officers.	62400	121440	130080	138720	147360	156000	756000
b) Pay of Establishment	30570	54228	56904	59580	62256	64932	328470
c) Other Allowances and Honoraria.	64100	134970	145060	150143	155226	160309	809808
Total:-	1,57,070	3,10,638	3,32,044	3,48,443	3,64,842	3,81,241	18,94,278
2. CONTINGENCIES.							
a) Non-Recurring.	32000	152000	-	-	-	-	184000
b) Recurring.	70800	205000	235000	256000	263000	271000	1300800
Total Contingencies(a&b).	102800	3,57,000	2,35,000	2,56,000	2,63,000	2,71,000	14,84,800
Grand Total (1 + 2)	2,59,870	6,67,638	5,67,044	6,04,443	6,27,842	6,52,241	33,79,078

PROVINCIAL HEADQUARTER

II. PROVINCIAL HEADQUARTER	Posts:1976-77		Posts:1977-78		Posts:1978-79		Posts:1979-80		Posts:1980-81		Posts 81-82		Total
A. PAY OF OFFICERS													
1. Director(NPS-19)	1	10800	1	22560	1	23520	1	24480	1	25440	1	26400	133200
2. Technical Officer(NPS-18)	-	-	1	12000	1	12900	1	13800	1	14700	1	15600	69000
3. Assistant Director (Technical)(NPS-17)	-	-	1	6000	1	6600	1	7200	1	7800	1	8400	36000
4. Agriculture Officer Technical(NPS-16)	-	-	2	9600	2	10440	2	11280	2	12120	2	12960	56400
5. Administrative Officer (NPS-16)	1	2400	1	5220	1	5640	1	6060	1	6480	1	6900	32700
6. Assistant Accounts Officer(NPS-16)	-	-	1	4800	1	5220	1	5640	1	6060	1	6480	28200
Total:-		13200		60180		64320		68460		72600		76740	355500
B. PAY OF ESTABLISHMENT													
1. Senior Superintendent (NPS-13)	1	2925	1	4200	1	4500	1	4800	1	5100	1	5400	26925
2. Office Assistant(NPS-10)	2	3000	4	12432	4	13296	4	14160	4	15024	4	15888	73800
3. Senior Scale Steno-grapher(NPS-12)	1	1800	1	3840	1	4080	1	4320	1	4560	1	4800	23400
4. Senior Clerks(NPS-6)	2	1980	6	12072	6	12648	6	13224	6	13800	6	14376	68100
5. Junior Clerks(NPS-5)	5	4500	6	11160	6	11592	6	12024	6	12456	6	12888	64620
6. Sweeper(NPS-1)	1	900	1	1224	1	1248	1	1272	1	1296	1	1320	7260
7. Daftari(NPS-2)	1	660	1	1356	1	1392	1	1428	1	1464	1	1500	7800
8. Peons(NPS-1)	5	3000	6	7320	6	7464	6	7608	6	7752	6	7896	41040
9. Chowkidar(NPS-1)	1	900	1	1224	1	1248	1	1272	1	1296	1	1320	7260
10. Mali(NPS-1)	1	900	1	1224	1	1248	1	1272	1	1296	1	1320	7260
11-Vehicle Driver(NPS-3)	2	1440	2	2952	2	3024	2	3096	2	3168	2	3240	16920
Total:-		22005		59004		61740		64476		67212		69948	344385

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
C. OTHER ALLOWANCES AND HONORARIA							
1. OTHER ALLOWANCES AND HONORARIA.							
Officers.	5280	24072	25728	27384	29040	30696	142200
Establishment.	13200	35402	37044	38685	40327	41968	206626
Total:-	18480	59474	62772	66069	69367	72664	348826
2. TRAVELLING ALLOWANCES.							
Officers.	10000	50000	50000	50000	50000	50000	260000
Establishment.	2000	5000	10000	10000	10000	10000	47000
Total:-	12000	55000	60000	60000	60000	60000	307000
Grand Total:-	30480	114474	122772	126069	129367	132664	655826
D: CONTINGENCIES.							
1. Non-Recurring:							
One Vehicle(Jeep)	90000	-	-	-	-	-	90000
Duplicating Machine.	17000	-	-	-	-	-	17000
Culculator.	2000	-	-	-	-	-	2000
Typewritter.	-	20000	-	-	-	-	20000
Furniture.	13000	5000	-	-	-	-	18000
Total:-	122000	25000	-	-	-	-	147000

2. RECURRING	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
P.O.L.for vehicles.	20000	45000	50000	55000	60000	63000	293000
Repair and spare.	8000	16000	20000	20000	20000	21000	105000
Rent rate and taxes.	18000	36000	40000	40000	40000	42000	216000
Service Stamps.	1500	3000	4000	5000	5000	6000	24500
Stationery.	6000	15000	20000	20000	25000	26250	112250
Publicity.	2500	5000	8000	8000	8000	10000	41500
Electricity.	1500	4000	5000	5000	5000	6000	26500
Telephone.	7500	18000	18000	18000	20000	22000	103500
Hot and cold weather charges.	300	8000	10000	10000	10000	12000	53000
Other contingencies.	15000	10000	10000	10000	10000	15000	70000
Liveries.	1000	-	-	1500	-	-	2500
Total:-	84000	160000	185000	192500	203000	223250	1047750
Grand Total(1 &2)	206000	185000	185000	192500	203000	223250	1194750

VIII

SUMMARY OF EXPENDITURE(PROVINCIAL HEADQUARTER)

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
1. PAY AND ALLOWANCES							
Pay of Officers.	13200	60180	64320	68460	72600	76740	355500
Pay of Establishment.	22005	59004	61740	64476	67212	69948	344385
Other allowances and honoraria.	30480	114474	122772	126069	129367	132664	655826
Total:-	65685	233658	248832	259005	269179	279352	1355711
2. CONTINGENCIES.							
Non-Recurring.	122000	25000	-	-	-	-	147000
Recurring.	84000	160000	185000	192500	203000	223250	1047750
Total contingencies.	206000	185000	185000	192500	203000	223250	1194750
Grand Total(1+2)	271685	418658	433832	451505	472179	502602	2550461

III. TRAINING AND RESEARCH

A. Pay of Officers.	Posts.	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
1. Deputy Director(Training and research)NPS-18.+ Rs.275/- (Special pay)	1	11,480	16,200	17,100	18,000	18,900	19,800	1,01,48(
2. Agriculture Engineer(Land Development and Equipment) NPS-18	1	9,000	12,900	13,800	14,700	15,600	16,500	82,50(
3. Agriculture Engineer(Water Course) NPS-18	1	9,000	12,900	13,800	14,700	15,600	16,500	82,50(
4. Agriculture Economist NPS-18	1	9,000	12,900	13,800	14,700	15,600	16,500	82,50(
5. Agronomist. NPS-18	1	9,000	12,900	13,800	14,700	15,600	16,500	82,50(
6. Soil Scientist. NPS-18	1	9,000	12,900	13,800	14,700	15,600	16,500	82,50(
7. Assistant Agricultural Engineer Equipment (NPS-17)	1	4,500	6,600	7,200	7,800	8,400	9,000	43,50(
8. Assistant Director Farms. NPS.17	1	4,500	6,600	7,200	7,800	8,400	9,000	43,50(
9. Research Officer. NPS-17	1	-	6,000	6,600	7,200	7,800	8,400	36,00(
10. Assistant Agronomist. NPS-17	1	-	6,000	6,600	7,200	7,800	8,400	36,00(
11. Assistant Soil Scientist. NPS-17	1	-	6,000	6,600	7,200	7,800	8,400	36,00(
12. Assistant Agriculture Engineer (Land Development) NPS-17	1	-	6,000	6,600	7,200	7,800	8,400	36,00
13. Assistant Agricultural Engineer (Water Course) NPS-17	1	-	6,000	6,600	7,200	7,800	8,400	36,00
14. Agricultural Officer (Demonstration) NPS-16	1	-	4,800	5,220	5,640	6,060	6,480	28,20
15. Land Development Officer NPS.16	4	-	19,200	20,880	22,560	24,240	25,920	1,12,80
Total:		65,480	1,47,900	1,59,600	1,71,300	1,83,000	1,94,700	9,21,98

TRAINING AND RESEARCH...

B. Pay of Establishment. Name of Post with scale No.	Posts.1976-77		Post.1977-78		Post.1978-79		Post.1979-80		Post.1980-81		Post.1981-82		Total
1. Supe intendent(NPS-11)	1	2,475	1	3,540	1	3,780	1	4,020	1	4,260	1	4,500	22,575
2. Office Assistant (NPS-10)	2	4,500	2	6,432	2	6,864	2	7,296	2	7,728	2	8,160	40,980
3. Stenographer(NPS-10)	1	2,250	1	3,216	1	3,432	1	3,648	1	3,864	1	4,080	20,490
4. Senior Clerks(NPS-6)	3	4,445	3	6,228	3	6,516	3	6,804	3	7,092	3	7,380	38,465
5. Juniors Clerks(NPS-5)	4	5,400	4	7,488	4	7,776	4	8,064	4	8,352	4	8,649	45,720
6. Daftari(NPS-2)	1	990	1	1,344	1	1,368	1	1,392	1	1,416	1	1,440	7,950
7. Peons (NPS-1)	7	6,300	7	8,568	7	8,736	7	8,904	7	9,072	7	9,240	50,820
8. Chowkidar(NPS-1)	1	900	2	2,424	2	2,472	2	2,520	2	2,568	2	2,616	13,500
9. Mali (NPS-1)	1	900	1	1,224	1	1,248	1	1,272	1	1,296	1	1,320	7,260
10. Sweeper (NPS-1)	1	900	2	2,424	2	2,472	2	2,520	2	2,568	2	2,616	13,500
11. Baldars (NPS-1)	3	2,700	4	4,872	4	4,967	4	5,064	4	5,160	4	5,256	28,020
Total.		31,760		47,760		49,632		51,504		53,376		54,248	2,89,280

CONTINUED.

Name of the Posts with Scale	Post. 1976-77		Post. 1977-78		Post. 1978-79		Post. 1979-80		Post. 1980-81		Post. 1981-82		Total
12 Drafts-man (NPS-10)	1	1,200	1	3,216	1	3,432	1	3,648	1	3,864	1	4,080	19,440
13. Tracer (NPS-5)	1	900	1	1,872	1	1,944	1	2,016	1	2,088	1	2,160	10,980
14. Mechanic(Tractor) (NPS-9)	2	2,400	2	5,088	3	7,776	3	8,208	4	11,040	4	11,616	46,128
15. Tractor Driver(NPS-5)	8	10,800	11	20,376	16	30,168	16	31,320	22	43,272	22	44,856	1,80,792
16. Vehicle Driver(NPS-3)	5	5,400	5	7,380	5	7,560	5	7,740	5	7,920	5	8,100	44,100
17. Helper (NPS-1)	3	2,700	3	3,672	3	3,744	3	3,816	3	3,888	3	3,960	21,780
18. Redman(NPS-1)	3	2,700	3	3,672	3	3,744	3	3,816	3	3,888	3	3,960	21,780
19, Mechanic(Vehicle) (NPS-8)	1	1,800	1	2,544	1	2,688	1	2,832	1	2,976	1	3,120	15,960
20. Projectionist (NPS-6)	1	1,485	1	2,076	1	2,172	1	2,268	1	2,364	1	2,460	12,845
21. Field Assistant (NPS-5)		-	2	3,600	2	3,744	2	3,888	2	4,032	2	4,176	19,440
Total.		6,145		1,01,256		1,16,604		1,21,056		1,38,708		1,43,736	6,22,505

OTHER ALLOWANCES AND HONORARIA (Training and Research)

1. Other Allowances	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
Officers.	26,000	59,160	63,840	68,520	73,200	77,880	3,68,600
Establishment.	40,000	62,200	71,445	74,164	84,780	87,832	4,20,421
Total:-	66,000	1,21,360	1,35,285	1,42,684	1,57,980	1,65,712	7,89,021
2. Travelling Allawance.							
Officers.	18,000	58,500	58,500	58,500	58,500	58,500	3,10,500
Establishment.	10,000	42,000	42,000	42,000	42,000	42,000	2,20,000
Total:-	28,000	1,00,500	1,00,500	1,00,500	1,00,500	1,00,500	5,30,500
Total(1+2)	94,000	2,21,860	2,35,785	2,43,184	2,58,480	2,66,212	13,19,521

CONTINGENCIES (Training and Research)

1) NON-Recurring	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
Vehicles(Mini Bus=two)* (Pick up =one)	2,70,000 (3)	-	-	-	-	-	2,70,000
Tractor for training.	1,40,000 (2)	2,10,000(3)	3,50,000(5)	-	4,20,000(6)	-	11,20,000
Scrapers.	21,000 (2)	10,500(1)	-	-	-	-	31,500
Land Plans.	6,600 (2)	3,300(1)	-	-	-	-	9,900
Chiesel Plough.	4,000 (1)	4,000(1)	-	-	-	-	8,000
Cultivator.	3,500 (1)	14,000(4)	-	-	-	-	17,500
Seed Drills.	5,000 (1)	-	-	-	-	-	5,000
Set of Border Disc.	7,000 (1)	14,000(2)	-	-	-	-	21,000
Set of Tools and Others.	6,000	6,000	6,000	6,000	6,000	6,000	36,000
Trollies.	12,000 (1)	12,000(1)	-	-	-	-	24,000
Other equipment, Photo-Graphic drawing Section and Copying Unit.	30,000	70,000	20,000	20,000	20,000	20,000	1,80,000
Construction and Renovation of Hostal Rooms and Training Centre.	-	2,21,24,301	-	-	-	-	2,21,24,301
Total:-	5,05,100	,22,46,810 1	3,76,000	26,000	4,46,000	26,000	2,38,47,201

2) Recurring. (Training & Research)

	1976-77.	1977-78	1978-79	1979-80	1980-81	1981-82	Total.
P.O.L Vehicles.	25000	60000	70000	80000	90000	95000	420000
P.O.L Tractors.	30000	70000	80000	80000	120000	120000	500000
Repair and Spare of vehicles/tractors.	15000	40000	50000	60000	70000	80000	315000
Land levelling/equipment.	10000	20000	30000	30000	30000	40000	160000
Rent,Rates and Taxes.	30000	40000	40000	40000	40000	40000	230000
Postage Stamps.	1500	1000	1000	1000	1000	1000	6500
Stationary.	5000	8000	10000	15000	15000	17000	70000
Publicity/printing.	6000	10000	13000	14000	15000	16000	74000
Electricity.	5000	8000	10000	10000	10000	12000	55000
Hot and Cold weather charges.	3000	5000	5000	5000	5000	6000	29000
Liveries.	2000	-	-	3000	-	-	5000
Training Material.	15000	30000	30000	30000	30000	30000	165000
Total:-	147500	292500	339000	368000	426000	457000	2029500

One Mini-Bus for training at Agriculture University,Lyallpur.

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total:
B/F	147500	292000	339000	368000	426000	457000	2029500
Demonstration Farm and Demonstration at Farmer's farm(Seed Fertilizer and Pesticides etc).	25000	50000	60000	60000	60000	60000	315000
Telephone.	3000	8000	8000	8000	8000	8000	43000
Other Contingencies.	15000	30000	40000	50000	60000	60000	255000
Farm Rent.	12500	75000	75000	-	-	-	162500
TRAINING ALLOWANCES.							
(a) Training Precision land levelling watercourse Engineer,Agricultural Officer,Bankers & Farmers.	50000	50000	50000	50000	50000	50000	300000
(b) Training Expenditure at Agriculture University.	40260	43270	45470	-	-	-	127000
Total Recurring.	293260	548270	615470	536000	604000	635000	3232000
Grand Total: (1+2)	798360	23016371	991470	562000	1050000	661000	27079201

BUDGET FOR TRAINING OF PERSONNELS AT AGRICULTURE UNIVERSITY IN"CCC"

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
(a) Hall Charges. 30+30+30=90 Students @ Rs.339/- per Student.	10.15	10.15	10.15	-	-	-	30.45
(b) Tution Fee. 30+30+30=90 Students @ Rs.450/- Student/ Semester.	13.50	13.50	13.50	-	-	-	40.50
(C) Contingencies.							
(i) Vehicle	(Funds) Provided Under Non-Recurring contingencies in the annexure of Training and Research.						
(ii) P.O.L.	4.61	4.62	4.62	-	-	-	13.85
(iii) Repair and Maintenances.	3.00	3.00	3.00		-	-	9.00
(iv) Miscellaneous Contingencies viz Telephone, Stationery etc.	5.00	5.00	5.20	-	-	-	15.20
(d) T.A of University Staff	2.00	3.50	3.50	-	-	-	9.00
(e) Wages.	2.00	3.50	3.50	-	-	-	9.00
Total:-	40.26	43.27	43.47	-	-	-	127.00

Note: Land Plane, Scraper, Cultivator and Flumes will be provided to the University from the Stock provided in the Project, and to be taken back after completion of the training.

Summary of Expenditure (Training and Research)

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total:
1) Pay and Allowances.							
Pay of Officers.	65480	147900	159600	171300	183000	194700	921980
Pay of Establishment.	61145	101256	116604	121056	138708	143736	682505
Other Allowances and Honorraria.	94000	221860	235785	243184	258480	266212	1319251
Total:-	220625	471016	511989	535540	580188	604648	2924006
2) Contingencies.							
Non-Recurring.	505100	22468101	376000	26000	446000	26000	23847201
Recurring.	293260	548270	615470	536000	604000	635000	3232000
Total Contingencies.	798360	23016371	991470	562000	1050000	661000	27079201
Grand Total (1+2)	1018985	23487387	1503459	1097540	1630188	1265648	30003207

AREA TEAM

A. PAY OF OFFICERS.	Post.	1976-77	Post	1977-78	Post	1978-79	Post	1979-80	Post	1980-81	Post	1981-82	Total
1. Water Management Coordinator (Team Leader) (NPS-18)	1	6000	1	12900	2	25800	3	39600	4	54300	4	57900	196500
2. Assistant Agriculture Engineer(NPS-17)	1	3000	1	6600	2	13200	3	20400	4	28200	4	30600	102000
3. Assistant Agronomist (NPS-17)	-	-	1	6000	1	6600	1	7200	1	7800	1	8400	36000
Total		9000		25500		45600		67200		90300		96900	334500

B. PAY OF ESTABLISHMENT													
1. Office Assistant (NPS-10)	1	1500	1	3216	2	6432	3	9864	4	13512	4	14376	48900
2. Steno-typist (NPS-8)	1	1200	1	2544	2	5088	3	7776	4	10608	4	11184	38400
3. Senior Clerks (NPS-6)	2	1980	2	4152	4	8304	6	12648	8	17184	8	17952	62220
4. Junior Clerk (NPS-5)	4	3600	4	7488	8	14976	12	22752	16	30816	16	31968	111600
5. Vehicle Driver (NPS-3)	1	720	2	2916	4	5868	6	8892	8	11988	8	12276	42660
6. Peons(NPS-1)	3	1800	3	3672	6	7344	9	11088	12	14904	12	15192	54000
7. Chowkidar(NPS-1)	1	600	1	1224	2	2448	3	3696	4	4968	4	5064	18000
8. Rodman(NPS-1)	2	1200	2	2448	4	4896	6	7392	8	9936	8	10128	36000
9. Sweeper(NPS-1)	1	600	1	1224	2	2448	3	3696	4	4968	4	5064	18000
Total:-		13200		28884		57804		87804		118884		123204	429780

C.1. OTHER ALLOWANCES AND HONORARIA (AREA TEAM)

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
Officers.	360	10200	18240	26880	36120	38760	133800
Establishment.	792	17330	34682	52682	71330	73922	257866
Total	1152	27530	52922	79562	107450	112682	391666

2. TRAVELLING ALLOWANCES

Officers.	6900	18000	26000	36000	46000	46000	178900
Establishment.	5000	10000	15000	15000	15000	15000	75000
Total:-	11900	28000	41000	51000	61000	61000	253900
Total(1+2)	23420	55530	93922	130562	168450	173682	645566

D. CONTINGENCIES(AREA TEAM)	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
1. Non-Recurring							
Vehicles.	90000	90000	180000	180000	180000	-	720000
Duplicating Machine.	17000	-	17000	-	-	-	34000
Calculator	2000	-	2000	2000	2000	-	8000
Furniture.	10000	-	10000	10000	10000	-	40000
Type writer.	5000	-	5000	5000	5000	-	20000
Total:-	124000	90000	214000	197000	197000	-	822000
2. Recurring.							
P.C.L.Vehicles.	10000	20000	40000	60000	60000	60000	250000
Repair and spare.	2500	5000	10000	15000	20000	20000	72500
Rent,Rate and taxes.	10000	30000	30000	50000	50000	50000	220000
Service stamps.	520	1000	2000	3000	4000	4000	14520
Stationery.	2500	5000	10000	10000	10000	10000	47500
Publicity.	1000	2000	5000	7000	10000	10000	35000
Telephone.	3000	6000	12000	15000	18000	18000	72000
Electricity.	2000	4000	8000	8000	8000	8000	38000
Hot and cold weather charges.	500	1000	2000	3000	4000	4000	14500
Other contingencies.	7000	7000	10000	15000	20000	20000	79000
Total:-	39020	81000	129000	186000	204000	204000	843020
Total contingencies(1+2)	163020	171000	343000	383000	401000	204000	1665020

SUMMARY OF EXPENDITURE(AREA TEAM)

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
1.PAY & ALLOWANCES.							
Pay of Officers.	9000	25500	45600	67200	90300	96900	334500
Pay of Establishment.	13200	28884	57804	87804	118884	123204	429780
Other allowances and honoraria.	23420	55530	93922	130562	168450	173682	645566
	45620	109914	197326	285566	377634	393786	1409846
2. CONTINGENCIES.							
Non-Recurring.	124000	90000	214000	197000	197000	-	822000
Recurring.	39020	81000	129000	186000	204000	204000	843020
Total contingencies.	163020	171000	343000	383000	401000	204000	1665020
Grand Total.(1+2)	208640	280914	540326	668566	778634	597786	3074866

FIELD TEAM.

S. No.	Name of posts with scale No.	Posts 1976-77		Posts 1977-78		Posts 1978-79		Posts 1979-80		Post 1980-81		Posts 1981-82		Total
A.	PAY OF OFFICERS.													
1.	Water Management Specialist(Team Leader(NPS-17)	5	15000	10	63000	15	99000	25	168000	35	243000	40	294000	882000
2.	Watercourse Development Officer(NPS-16)	5	12000	20	98100	30	154500	50	263100	70	380100	80	457500	1365300
3.	Land Development Officer(NPS-16)	25	60000	50	250500	75	391500	125	663000	175	955500	200	1149000	3469500
4.	Agriculture Officer (NPS-16)	5	12000	10	50100	15	78300	25	132600	35	191100	40	229800	693900
	Total:-		99000		461700		723300		1226700		1769700		2130300	6410700
B.	PAY OF ESTABLISHMENT													
1.	Senior Clerks(NPS-6)	5	4950	10	20280	15	31140	25	52380	35	74580	40	87840	271170
2.	Junior Clerk(Typist) (NPS-5)	5	4500	10	18360	15	28080	25	47160	35	66960	40	78480	243540
3.	Vehicle Driver(NPS-3)	5	3600	10	14850	15	22140	25	37080	35	52380	40	60840	190620
4.	Peons(NPS-1)	5	3000	10	12120	15	18360	25	30720	35	43320	40	50160	157680
5.	Chowkidar(NPS-1)	5	3000	10	12120	15	18360	25	30720	35	43320	40	50160	157680
6.	Rodman/Beldar(NPS-1)	35	21000	70	84840	105	128520	175	215040	245	303240	280	351120	1103760
	Total:-		40050		162300		246600		413100		583800		678600	2124450

C.1. OTHER ALLOWANCES AND HONORARIA.	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
(FIELD TEAM)							
Officers.	39600	184680	289320	490680	707880	852120	2564280
Establishment.	24030	97380	147960	247860	350280	407160	1274670
Total:-	63630	282060	437280	738540	1058160	1259280	3838950
2. TRAVELLING ALLOWANCE.							
Officers.	75000	320000	400000	500000	650000	650000	2595000
Establishment.	30000	130000	210000	275000	360000	400000	1405000
Total:-	105000	450000	610000	775000	1010000	1050000	4000000
Grend Total (1+2)	168630	732060	1047280	1513540	2068160	2309280	7838950

FIELD TEAM

D. CONTINGENCIES.	1976-77 (Six months)	1977-78	1978-79	1979-80	1980-81	1981-82	Total
1. NON RECURRING							
1. Vehicles.	450000(5)	450000(5)	450000(5)	900000(10)	900000(10)	450000(5)	3600000
2. Tractor for Private contractors at Rs.70090 each.	-	3500000(50)	1750000(25)	1750000(25)	-	-	7000000 (100 tract)
3. Motorcycles	400000(40)	450000(45)	450000(45)	800000(80)	800000(80)	450000(45)	3350000
4. Typewriter.	25000(5)	25000(5)	25000(5)	50000(10)	50000(10)	25000(5)	200000
5. Supporting Equipment, Syphen tubes measures and equipment.	30000	80000	80000	160000	160000	80000	590000
6. Soil Scrapers at Rs.10500 each.	-	63000(6)	63000(6)	105000(10)	136500(13)	157500(15)	525000
7. Land levellers at Rs.3300 each.-		19800(6)	19800(6)	33000(10)	42900(13)	49500(15)	165000
8. Chiesel Plough at Rs.4000 each.	-	4000(1)	4000(1)	8000(2)	12000(3)	12000(3)	40000
9. Border Disc at Rs.7000 each	-	14000 (2)	14000(2)	28000(4)	35000(5)	42000(6)	133000
10. Ditcher at Rs.7000 each.	-	14000(2)	14000(2)	28000(4)	35000(5)	42000(6)	133000
11. Syphen Tubes at Rs.200 each	-	34000(17)	34000(17)	58000(29)	80000(40)	92000(46)	298000
12. Levelling Instrument set at Rs.5000 each.	-	25000(5)	25000(5)	40000(8)	55000(11)	60000 (12)	205000
13. Furniture.	40000	40000	40000	80000	80000	40000	320000
14. Survey equipment.	30000	80000	80000	160000	160000	80000	590000
Total:-	975000	4798800	3048800	4200000	2546400	1580000	17149000

** The Equipment of Motorcycles also includes the provision for the personnel dealing with research/surveys in the Policy and Programme Framing Cell.

FIELD TEAM

CONTINGENCIES	1976-77	1977-78	1978-79	1979_80	1980-81	1981-82	Total
2. RECURRING							
(A) COST SHARING							
(a) P.L.L.Cost	268000	4824000	9380000	14740000	17420000	20368000	67000000
(b) Cost of living and structure.	250000	3500000	6000000	9250000	12500000	13500000	45000000
Total:(a+b)	518000	8324000	15380000	23990000	29920000	33868000	112000000
(B) OTHER CONTINCENCIES							
a. P.O.L.	50000	222500	345000	545000	745000	845000	2752500
b. Repair and spare for vehicle and P.L.L. equipment.	40000	105000	135000	210000	260000	310000	1060000
c. Rent rate and taxes.	15000	60250	90500	150500	210500	250500	777250
d. Postage stamp.	1500	6000	9000	15000	21000	25000	77500
e. Stationery.	3000	12000	18000	30000	45000	55000	163000
f. Electricity.	3000	12000	18000	30000	45000	55000	163000
g. Hot and cold weather charges.	1500	6000	9000	15000	21000	25000	77500
h. Part time sweeper at Rs.50/- per month.	1500	6000	9000	15000	21000	24000	76500
i. Other contingencies.	7500	30000	45000	75000	105000	120000	382500
Total:	123000	459750	678500	1085500	1473500	1709500	5529750
Total(A+B)	641000	8783750	16058500	25075500	31393500	35577500	117529750

SUMMARY OF EXPENDITURE(FIELD TEAM)

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
A. Pay of Officer.	99000	461700	723300	1226700	1769700	2130300	6410700
Pay of Establishment	40050	162300	246600	413100	583800	678600	2124450
Other allowances and honoraria.	168630	732060	1047280	1513540	2068160	2309280	7838950
Total pay:-	307680	1356060	2017180	3153340	4421660	5118180	16374100
B. CONTINGENCIES.							
(i) Non-Recurring.	975000	4798800	3048800	4200000	2546400	1580000	17149000
(ii) Recurring							
(a) Cost sharing.	518000	8324000	15380000	23990000	29920000	33868000	112000000
(b) Other contingencies.	123000	459750	678500	1085500	1473500	1709500	5529750
Total(a+b)	641000	8783750	16058500	25075500	31393500	35577500	117529750
Total(i+ii)	1616000	13582550	19107300	29275500	33939900	37157500	134678850
Grand Total(A+B)	1923680	14938610	21124480	32428840	38361560	42275680	151052850

CONSOLIDATED SUMMARY

A. PAY OF OFFICERS	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
1. Planning Cell.	62400	121440	130080	138720	147360	156000	756000
2. Provincial Headquarter.	13200	60180	64320	68460	72600	76740	355500
3. Training and Research.	65480	147900	159600	171300	183000	194700	921980
4. Area Team.	9000	25500	45600	67200	90300	96900	334500
5. Field Team.	99000	461700	723300	1226700	1769700	2130300	6410700
Total:-	249080	816720	1122900	1672380	2262960	2654640	8778680
B. PAY OF ESTABLISHMENT							
1. Planning Cell.	30570	54228	56904	59580	62256	64932	328470
2. Provincial Headquarter.	22005	59004	61740	64476	67212	69948	344385
3. Training and Research.	61145	101256	116604	121056	138708	143736	682505
4. Area Team.	13200	28884	57804	87804	110804	123204	429780
5. Field Team.	40050	162300	246600	413100	583800	678600	2124450
Total:-	166970	405672	539652	746016	970860	1080420	3909590
C: OTHER ALLOWANCES AND HONORARIA							
1. Planning Cell.	64100	134970	145060	150143	155226	160309	809808
2. Provincial Headquarter.	30480	114474	122772	126069	129367	132664	655826
3. Training and Research.	94000	221860	235785	243184	258480	266212	1319521
4. Area Team.	23420	55530	93922	130562	168450	173682	645566
5. Field Team.	168630	732060	1047280	1513540	2068160	2309280	7838950
Total:-	380630	1258894	1644819	2163498	2779683	3042147	11269671
Total Pay(a+b+c)	796680	2481286	3307371	4581894	6013503	6777207	2395794 ~~2395741~~

CONTINGENCIES	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Total
(a) Non-Recurring							
1. Planning Cell.	32000	152000	-	-	-	-	184000
2. Provincial Headquarter.	122000	25000	-	-	-	-	147000
3. Training and Research.	505100	22468101	376000	26000	446000	26000	23847201
4. Area Team.	124000	90000	214000	197000	197000	-	822000
5. Field Team.	975000	4798800	3048800	4200000	2546400	1580000	17149000
Total(a)	1758100	27533901	3638800	4423000	3189400	1606000	42149201
(b) Recurring							
1. Planning Cell.	70800	205000	235000	256000	263000	271000	1300800
2. Provincial Headquarter.	84000	160000	185000	192500	203000	223250	1047750
3. Traing and Research.	293260	548270	615470	536000	604000	635000	3232000
4. Area Team.	39020	81000	129000	186000	204000	204000	843020
5. Field Team.	641000	8783750	16058500	25075500	31393500	35577500	117529750
Total(b)	1128080	9778020	17222970	26246000	32667500	36910750	123953320
Total contingencies(a+b)	2886180	37311921	20861770	30669000	35856900	38516750	166102521
Grand Total:-	3682860	39793207	24169141	35250894	41870403	45293957	190060462

A B S T R A C T

	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	Tota
1. Pay and Allowances.	796680	2481286	3307371	4581894	6013503	6777207	2395794
II. Contingencies							
A. Non-Recurring	1758100	27533901	3638800	4423000	3189400	1606000	4214920
B. Recurring							
i. Cost sharing.	518000	3324000	15380000	23990000	29920000	33868000	11200000
ii. Other contingencies.	610080	1454020	1842970	2256000	2747500	3042750	1195332
Total (i+ii)	1128080	9778020	17222970	26246000	32667500	36910750	12395332
Total(A+ B)	2886180	37311921	20861770	30669000	35856900	38516750	16610252
Grand Total:-	3682860	39793207	24169141	35250894	41870403	45293957	19006046