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AUDIT REPORT

UNITED STATES ASSISTANCE

TO THE

AGRICULTURAL SECTOR

PAKISTAN

Period: As of March 31, 1973

Audit Report No. 5-391-73-53

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A

REPORT ON
UNITED STATES ASSISTANCE
TO THE
AGRICULTURAL SECTOR
PAKISTAN

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REPORT ON UNITED STATES ASSISTANCE TO THE AGRICULTURAL SECTOR PAKISTAN

As of March 31, 1973

PART I

PURPOSE AND SCOPE

The Islamabad staff of the Area Auditor General, Near East, has conducted a review of the United States Agency for International Development (AID) assistance made available through the Agency's Mission in Pakistan (USAID) to the Agricultural Sector of the Government of Pakistan (GOP).

The performance of our audit was directed toward a review of the progress made and accomplishments achieved through USAID's assistance in relation to the overall GOP's annual plans and A.I.D.'s projected goals for agricultural development within Pakistan. We focused our attention primarily on the period beginning with the delinking of the former East Pakistan's agriculture activity from the aggregate GOP agricultural sector which occurred after the India-Pakistan War in December 1971 and March 31, 1973, our audit cut-off date. However, we scanned through periods of agricultural development prior to December 1971 when deemed essential to a better understanding of the GOP's and USAID's strategy and performance relevant to achieving increased agricultural production.

During the review we made a concerted effort to determine whether management was focusing on development activities in agriculture in which A.I.D. financed inputs (along with complementary inputs by the GOP and other donors) were having a significant impact on the agricultural sector. Likewise, we were interested in determining whether programmed inputs coincide with GOP priorities, readiness to accept assistance, and capability to effectively absorb or beneficially utilize the assistance provided.

Views and opinion of USAID and GOP officials engaged in agricultural research were obtained. We visited selected project sites to observe activities on the farm and the pursuit of agriculture at the government and university levels. Selective test-checks were made to determine

the appropriateness of project related obligations and expenditures. We utilized relevant material gathered during the performance of prior related audits and reviewed pertinent informative data available at the offices of USAID, GOP and donor organizations.

The review was performed intermittently from January through April 1973.

PART II

BACKGROUND

Agriculture in Pakistan's Economy

In the rapid industrialization of Pakistan's economy, agriculture continues to dominate and the country's performance is dependent upon agricultural growth. Three fourths of the population live in rural areas and more than half of the civilian labor force is engaged in the agricultural sector of productivity. About 40 per cent of the national income originates in the agricultural sector.

Small, privately operated farms are the basic source of Pakistan's agricultural production. The average farm is about ten acres in size and is often comprised of scattered fragments. The greater portion of the agricultural land within Pakistan's 311,000 square miles composed of the four provinces of Punjab, Baluchistan, Sind and the Northwest Frontier (EXHIBIT A) lies in a large fertile river basin. Of approximately 79 million arable acres, some 29 million acres are accessible to controlled irrigation facilities.

Perspective

Water is increasingly a constraint in the irrigated areas and the years 1970/71 and 1971/72 were bad years for surface water availability. Further the winter rains were unfavorable during these years.

Wheat production was down in 1971 and 1972 from what it was in 1970, due to the lower than usual water availability. The probability of a major wheat surplus in Pakistan within the next few years seems remote.

Coarse rice production is now in excess of the needs of Pakistan, attributed to the loss of the former East Pakistan market and a rapid increase in production. However, vegetable

oil continues to be a short item with demand growing faster than it can be supplied. Adaptive research is required to find appropriate types and varities of oilseeds and to improve cultivation patterns for Pakistan's conditions.

Production of foods rich in protein, minerals and vitamins, particularly pulses, is lagging. Notwithstanding the slack in the more nutritious foods and the need for improvement, pulse acreage and production have been moving steadily downward. The production of fruits and vegetables is increasing at a slower rate than that for grains, and perhaps at a rate not as fast as population growth.

The demand for fertilizer continues to rise. Farmers are using much less than half recommended rates of application. Pakistan will have to import fertilizer to meet shortfalls for several years until new plants can be erected.

Major Issues Emerging in the Agricultural Sector

USAID has indicated that the high rate of population growth in Pakistan, even if it is reduced, assures that between now and the end of this century the productivity of land and water must be markedly increased. Upon approaching the upper limits of the new cereal technologies, the rate increase in agricultural production will slow down unless new technological break-throughs occur. By 1985 Pakistan may approach the practical upper limits of its irrigation potential; that is, most of the water sources available for irrigation that can be economically exploited with present technologies in use will have been tapped, and water will be a serious constraint.

Water Resources

The GOP Planning Commission in its Annual Plan for 1972-73 asserts:

> "Notwithstanding the fact that Pakistan is predominantly an agricultural country and that a larger proportion of its land is irrigated than in any other country of the world, it presently does not produce sufficient food to meet the needs of its people. The low crop yields are attributable to the following major factors:
>
> i) insufficient water in a large part of the region resulting in under-irrigation;

ii) inadequate natural and artificial drainage system, causing problems of water-logging and salinity; and

iii) wind erosion mostly in the southern and western Indus Plains and sheet and gully erosion in the sub-mountain region, causing damage to fertile lands.

The key to the solution of these problems is the development of additional water resources and an efficient drainage system. Irrigation and drainage have, therefore, been given high priority in the developmental efforts during the various plans."

Confrontation

The peoples representative Government of Pakistan, upon assuming office in December 1971 was confronted with an economic crisis, Civil war, the loss of its East Wing and the conflict with India caused serious economic dislocations and prompted the establishment of a new Government which immediately addressed itself to revitalizing the economy.

The new Government introduced a series of reforms covering important fields of social and economic life. In the agrarian field, ceilings of land holdings and produce units were drastically reduced. Aside from the land reforms, an integrated rural development program to boost agricultural production was launched.

The Government's commitment to agricultural development, in accordance with the GOP Annual Plan for 1972-73, reflects a high priority in the production of foodgrains and cash crops. Targets for 1972-73 envisage about a 10 per cent increase in the foodgrain crops which the Government hopes is a move toward self reliance in wheat production in the not too distant future. However, from available information it appears that many of the production targets are not likely to be achieved because of low irrigation canal discharges, irregular electrical supply for tubewells and shortage of input supplies.

GOP's Development Program and Annual Plans

In the financial allocation to the various sectors, considerable emphasis is given by the GOP to development programs within the agriculture area of activity. The Annual Plan for 1972-73 provides a sum of Pakistani rupees 385 million ($38.9 million) for the agricultural sector (EXHIBIT B).

The GOP Annual Plan has been a flexible instrument for implementing the Five Year Plans. It is formulated in line with overall objectives, but permits the making of adjustments for each year, identifying specific short-term goals the realization of which move the economy in the direction determined by the longer-term plans. However, the plan for 1972-73 is different in that it was formulated at the end of a period during which the planning process broke down and the Fourth Five Year Plan (1971-75) no longer serves as a valid frame of reference for the Annual Plan. The GOP has indicated that the Annual Plan for 1972-73 is essentially a transition to a long-term plan; intended to prepare the economy for a new long-term growth strategy.

In its agriculture projections, the GOP is placing emphasis on increasing production of farmers in the rainfed (barani) areas. It desires to develop new systems to help those farmers who have been left behind because of past emphasis on improving irrigated agriculture.

The GOP is also promoting an Integrated Rural Development Program and People's Works Program. It is anticipated that by reaching the small farmers with the inputs and services they need, the concept of "agrovilles", rural community market places and service centers, will progress and expand. In this context, the Government of the Punjab Province proposed that improvements in water management should begin initially as part of the integrated rural development program. The GOP plan for development programs in the agricultural sector also reflects the Government's strong interest in increasing salinity control and reclamation projects (SCARP), private sector tubewells, and increasing fertilizer inputs.

Foreign Assistance Provided to Pakistan

Since 1952 the United States agriculture related assistance commitments, made through A.I.D. and predecessor organizations to the GOP, total $943.6 million (EXHIBIT C). The total economic assistance provided by the United States to Pakistan (including the former East Wing) amounts to $4.6 billion.

As of March 31, 1973, the U.S. advisory assistance to Pakistan's agricultural sector through direct-hired full-time advisors totalled 540 man years; plus an additional number of man years of short-term advisors and consultants, as well as advisory services provided through AID-financed contracts. Another direct source of developing Pakistani talent in the agriculture sector has been the USAID participant training program. The Mission's Participant Directory lists a total of 1,249 Pakistanis who received Stateside or third country training,

as of June 1972. Of this total, 716 were from West Pakistan. Eighty-seven per cent of the returned participants are known to be employed in agriculture related activities.

EXHIBIT D reflects United States grant assistance provided to the development projects within the GOP agricultural sector from 1952 through March 31, 1973.

Foreign Assistance, besides that provided directly by the United States, is also provided by the Ford Foundation, United Nations Development Program, World Bank Group and the Consortium, which is comprised of 12 members: Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Norway, Sweden, United Kingdom, United States and the World Bank. Total economic assistance provided by other than U.S. donors approximates $4 billion.

PART III

SUMMARY OF MAJOR FINDINGS

Development in agriculture for which A.I.D. provided assistance has had an impact on the agricultural sector within Pakistan and improvement in some agrarian areas of productivity is very evident. Two major projects that reflect outstanding achievements are the Indus Basin (ANNEX I) and Salinity Control and Reclamation (ANNEX II).

Within the agricultural sector, USAID is currently assisting in water management and precision land leveling research which is in accord with Pakistan's concern to find better ways of using water for farm production. Assistance is also needed in many other areas. There is an ever increasing need for more fertilizer (ANNEX III) -- the average rate of application is minimal and no new fertilizer plants are under construction. There has been a downward trend in pulse production and in a country where the majority of the population is malnourished the high nutritional value of pulses has not been given adequate attention. The same was noted with regards to vegetable oil where the demand is growing faster than supplies. Imports under PL 480 help fill the gap but impede oilseed production and related research because the vegetable oil has been so readily available from the United States. More attention must be focused on improved efficiency in the production of foods rich in protein, minerals and vitamins.

Improvement of barani (rainfed) agriculture is accorded high priority by the GOP. In its planning USAID has also addressed itself to the needs of the barani farmer but a specific assistance approach has not yet been agreed upon. The problem is to adapt improved technology, generally available elsewhere, and to achieve a high rate of adoption by one and a half million farmers whose livelihood is based on barani conditions. We, therefore, strongly emphasize the advantages of instituting a system to compile and evaluate the results of relevant research and effectively disseminate field tested innovations that can improve farming practices.

Our review indicated the desirability for closer USAID coordination with the GOP Agricultural Research Council to strengthen the ARC's role to identify and define research priorities, promote interprovincial cooperation and provide supplementary funds for research when required. We are of the opinion that there is also a need for better USAID coordination with other donors. In particular we feel there is need for more formal documentation and exchange of information of mutual interest to the donors and the GOP. Records depicting progress achieved during the implementation of projects were nonexistent in many instances and this limited the effectiveness of the evaluation process.

Though we stress inconsistencies and weak areas in the agricultural assistance program, we are of the opinion that favorable overall results are evident and that in general USAID has performed well, considering the many constraints that have confronted the U.S. assistance program in Pakistan. In particular, the population in Pakistan has increased 51.33 per cent over the past 12 years (an average of about four per cent annually) and thus the benefits derived from the increase in production are overshadowed by the population explosion. Without U.S. assistance the prevailing minimal standard of nutrition could not have been maintained.

In accordance with Auditor General policy we have discussed our findings with Mission officials during the audit. The Director's designated representatives have reviewed a draft of the report and where applicable their views have been reflected in this report.

The audit report contains ten recommendations for USAID/Pakistan consideration.

PART IV

STATEMENT OF FINDINGS AND RECOMMENDATIONS

For the Director, USAID/Pakistan

A. Active Agriculture Projects

The USAID expended $245,219 during the first nine months of Fiscal Year 1973, in support of the following active agriculture assistance projects:

July 1, 1972 to March 31, 1973

	Expenditures	Unliquidated Obligations as of 3/31/73
391-11-110-145 (ProAg 70-25 dated 2/27/70) Agriculture Area Development	$ 8,274	$ 1,734
391-11-780-037.1 (ProAg 71-1 dated 10/12/70) Agriculture Census	25,327	41,629
391-17-296.2 (ProAg 71-14 dated 2/15/71) Agricultural Research, West Pakistan	47,440	113,428
391-11-119-320 Agriculture Technical Support	164,178	100,198
Total:	$245,219	$256,989

The Agriculture Census Project is basically a Public Services activity; however, the results of the census will be utilized in the agricultural sector. Most of the work under the ProAg has been accomplished and the GOP Agriculture Census Organization has developed an adequate capability to effectively complete the project. It is scheduled to be completed by the end of 1973 and the publication of census data is projected for early 1974.

The Agriculture Area Development Project is virtually completed but is retained in an active status until the outstanding $1,734 obligated balance is expended. The amount will be disbursed shortly for participant costs incurred under the ProAg.

Our examination of funds expended in current FY 1973 (thru March 31) disclosed that technical support and contract costs predominate in the active agriculture projects:

	Project 145	Project 037.1	Project 296.2	Project 320	Total
Technicians	$ -0-	$ -0-	$19,785	$130,706	$150,491
Contracted Services	-0-	25,327	12,999	32,916*	71,242
Participants	8,274	-0-	14,656	-0-	22,930
Commodities	-0-	-0-	-0-	556	556
Total:	$ 8,274	$25,327	$47,440	$164,178	$245,219

*Includes a $20,334 PASA expenditure.

We ascertained the propriety and accuracy of the above expenditures and determined that the USAID office of the Controller maintains an adequate control over outstanding obligations to ensure a valid status.

Prior audit coverage of individual project activities within the USAID's agriculture assistance program also included financial examinations of relevant expenditures and in our opinion, based on the audits performed, USAID records reflect accurately the financial status of the agriculture assistance program.

In addition to the dollar activity, USAID is also providing U.S.-owned local currency funded assistance (EXHIBIT E). On a test basis we determined the propriety of U.S.-owned local currency expenditures incurred in FY 1973 and similar to that of dollar expenditures, prior audits reflect applicable financial coverage. Local currency assistance is provided primarily to the GOP for the purpose of supplementing local costs incurred in agriculture research activities.

The first six projects reflected in EXHIBIT E are interrelated in a manner that makes Project 296.2 the main activity document; Project 367 is an integral part of Project 296.2 and the other four projects are complementary to the main project. The complex interrelationship within these projects is covered in Section C, the Project Implementation section of the report.

B. Project Documentation

Documentation in support of the basic Agricultural Research Project 391-17-660-296 includes a Project Paper (PROP) that was developed by USAID in 1969 and revised in December 1970.

Although the PROP makes reference to an integrable project, On-Farm Water Management Research (Project 367), it does not give consideration to recently initiated complementary projects, such as Punjab Water Management Research (Project No. 390) and Water Course Management Research (Project No. 391).

It was evident that, in general, ProAgs relevant to research-focused activities, present the purpose of the respective project in rather broad, very general terms and therefore lack the desired specificity.

ProAg provisions requiring periodic project completion reports have not been satisfactorily complied with. The ProAgs do not provide for progress reporting. We noted only one progress report, which we attribute to a recommendation in a prior audit report. It was prepared on Project 309, Land Forming Demonstrations, for the month of September 1971; thereafter, no progress reports were prepared. Likewise, advisors generally do not submit periodic progress reports nor End-of-Tour reports; and also, project directors are not required to submit progress reports. We believe that in the absence of progress reports, project monitoring lacks an essential medium in the Mission's project evaluation process.

In the past the Mission had not utilized a comprehensive logical framework approach in its planning process, nor did it develop adequate work plans or project implementation plans (PIPs) for the agriculture projects. In our prior audit reports we indicated the need for a planning procedure that would effectively articulate and guide the implementation process to ensure that inputs are provided in a timely manner, projects are efficiently implemented, progress and accomplishments can be adequately evaluated.

Our current review disclosed that the Mission has developed for a newly proposed precision land leveling project, a PROP, logical framework, an operational plan with PERT network and position descriptions for PASA team members. Mission has also assisted two provincial governments in developing PC-1 documents. In addition, although it occurred subsequent to our audit cut-off date, we noted that the Mission has issued a USAID Manual Order PAK-1025.1, effective April 19, 1973, on the subject "Program

Documents Flow and Clearance," which thoroughly delineates Mission's review and clearance responsibilities for the PROP, ProAg, PIOs and PAR.

Recommendation No. 1: USAID should reexamine the documentation applicable to each of the on-going and proposed projects and in accordance with well established requirements make certain that:

a) relevant planning, implementation and evaluation documents are adequately developed in a definitive and comprehensive manner for all USAID sponsored agriculture related projects; and

b) progress reports, essential to monitoring project implementation and the project evaluation performance, are appropriately prepared in a timely manner.

C. Project Implementation

1. Agricultural Research

- Agricultural Research Council -

The Agricultural Research Project No. 391-17-110-296.2 was developed in early 1969 as a four year project directed toward making agricultural research a foundation which would promote growth in agriculture within Pakistan. As of March 31, 1973, Rs.10,000,000 ($909,000), Section 104(f) (Mondale) Funds, had been allotted for the project and $380,000 was obligated to fund direct-hire technicians, participant training and contract services. Of the amount obligated, $257,000 has been expended as of March 31, 1973.

As reflected in EXHIBIT F, Rs.10 million was released by USAID to the GOP Finance Ministry in March 1971 for transmittal to the Agricultural Research Council (ARC). Of the Rs.10 million, Rs.3.4 million was earmarked for West Pakistan and Rs.6.6 million for East Pakistan. The ARC was to use a small portion of the allotment for its own development. Due to political unrest in East Pakistan, the GOP Finance Ministry withheld the release of the Rs.6.6 million and only released the West Pakistan portion (Rs.3.4 million) to the ARC. However, because of procedural delays the ARC did not receive the Rs.3.4 million

until April 1972. Rupees 261,000 has been reserved for establishing a Documentation Center within the ARC and the balance of Rs.3,139,000 is intended for the support of coordinated research activities in the Provinces of Sind, Punjab and the Northwest Frontier.

Upon the secession of East Pakistan, the Rs.6.6 million designated for the East became available for use in West Pakistan. USAID, through ProAg Revision No. 71-22 dated December 1972 (signed April 5, 1973), reprogrammed the Rs.6.6 million so as to release Rs.2.6 million to the ARC and the remaining Rs.4 million will go directly to the following three agricultural research projects:

Punjab Water Management (SHADAB):	Rs.1 million
Water Course Management (MONA):	Rs.2 million
Gidder Valley Agricultural Research Station Development:	Rs.1 million

(USAID developed separate ProAgs for the Shadab and Mona Projects and intends to prepare a ProAg for the Gidder Valley Project. The Mona ProAg was sent to the GOP February 5, 1973 and was signed by the GOP April 17, 1973. The Shadab ProAg, awaiting GOP approval since January 2, 1973, was signed May 2, 1973.)

The ARC is to maintain an active role in agriculture research and research proposals are to be reviewed and approved by the ARC. However, in the three activities funded directly, the desired flow through the ARC did not prevail. Circumventing the ARC through a direct research activity approach does not strengthen nor does it enhance the Council's intended role to identify and define research priorities.

In commenting on the draft of our report the Mission stated: "The staff of the Office of Agriculture Planning were keenly aware of the fact we were apparently circumventing the Agriculture Research Council (ARC) when we prepared separate ProAgs with specific organizations. In fact, members of that same staff are the ones insisting that ARC be developed into an organization that could receive and disburse all Ministry of Agriculture research funds. The fact that ARC was undergoing reorganization after the breakup of West Pakistan into four provinces was perhaps the main reason for not using that route for channelling funds. Another problem was the fact that MONA is not in the Ministry of Agriculture therefore would not be bureaucratically eligible for receiving "agriculture research" funds. Lastly, the 13 month wait for funds to reach ARC from Central Finance seemed indicative that the organization was not viable in the eyes of the officers "expediting" transfer

of funds. Happily we can report that the recent ProAg for 2.6 million rupees was the first of the four documents to be approved so the administrative status of ARC has definitely improved."

It is evident that there are many constraints that retard the ARC's progressive role, including the lack of adequate funds, which probably limits the ARC's performance most seriously, but we believe a more positive USAID approach to support the ARC is desirable.

The 1970 PROP on Project 296, Agricultural Research, is indicative of USAID's intent to strengthen the ARC:

> "The project will give technical and financial support to the development of a complex of priority-oriented research, coordinated through the national Agricultural Research Council (ARC) and Provincial Research Coordination Boards, and carried out by West Pakistan Agriculture University (WPAU) and selected agriculture colleges and research stations."
>
> "This technical support will help to develop the level of competence required to establish the agricultural priorities technologically and economically most desirable for West Pakistan. Financial assistance to the ARC will give that organization the power to ensure that these priorities are carried out. - - -."
>
> "The GOP Cabinet has begun to take actions to improve agricultural research coordination through reorganization and strengthening of the ARC. The ARC, with increased professional staff and provincial representatives, will establish priorities, fund major research programs and act as the inter-provincial coordinating and evaluating agency for agricultural research. The Provincial Governments are establishing research coordination committees to coordinate and administer research programs in their respective provinces in consultation with ARC. - - -."

With regards to progress made by the ARC, the most recent report on Agriculture Research in Pakistan (March 1973) by the Second Joint Pakistan-American Research Team indicates

that very little has been accomplished since the prior Pakistan-American review:

> "The Pakistan Council of Agricultural Research was recognized as ineffective and inadequate to serve national needs in 1968. It has not been improved at the present date, five years later."

The report prepared by the Pakistan-American Team was distributed to the GOP Ministry of Agriculture and on April 4, 1973 was discussed with the Special Assistant to the President of Pakistan and the Secretary and Director General of the ARC. The officials indicated the need for outside assistance and want to work closely with the USAID staff to develop details for an action role for the ARC, establish a national research center near Islamabad and provide assistance to priority programs.

In our opinion, agriculture within Pakistan cannot benefit efficiently from new technological inputs essential to agricultural growth if the ARC is not a strong national organization empowered with the authority to coordinate scientific research.

> Recommendation No. 2: USAID should coordinate all Mission sponsored research in agriculture with the Agricultural Research Council and maintain a cooperative relationship to help strengthen the ARC's national role in research.

- Benefits of Research -

An Oregon State University/USAID team, in a recent publication based on a ten-day review of the barani wheat production subsector, indicated that there is a real potential for increasing wheat production in the barani areas of Pakistan. The team is of the opinion that an improvement program should be followed which includes both short and long-term efforts. In presenting their observations they strongly advocate an increased effort in research, but caution that too often it becomes research for research sake, not for practical solutions to problems. Files of scientific reports are of little value to the farmer until they are translated into meaningful, useable information.

A recent 1973 publication on Agricultural Research in Pakistan, published jointly by the Agricultural Research Council and USAID, reflects on the yields in the barani area as being far

below potential. By applying several new production practices in 1969/70 scientists obtained an average yield of 2300 pounds per acre from 14 trials in an area that had an average yield of only 345 pounds per acre. It was stated in the report that within a modest investment and the application of new technology the barani area could reflect a substantial increase in production.

With regard to agrarian improvement within the barani agricultural subsector, USAID's dialogue with Provincial and Center officials is directed toward the possibility of an early activity concentrated on improved seeds and fertilizer distribution in the rainfed areas. However, at present a priority for research on pulses or oilseed research and development was not evident, even though USAID's position as reflected in its Agricultural Sector Analysis and proposed strategy for FY 1973 stresses that: "Nutrition considerations dictate the need to explore production of pulses and oilseeds."

Nevertheless, the United States in its assistance to Pakistan has supported, through USAID and predecessor agencies, several activities that are related to improvement in the barani areas; including land leveling, land formation, terracing, soil and water conservation, improved variety of seeds, research and experiments to improve or better agricultural implements for use with bullock power. These various thrusts for improvement were often initially identified as independent activities, then the activities were merged into a project only to be separated again. We believe that the results of such prior activities could be advantageously utilized if the relevant information was appropriately coordinated and more effectively disseminated.

We could not determine, for lack of relevant data, whether significant benefits result from the great effort that has been expended in agricultural research activities. Reports make reference to prior reports and corroborate earlier disclosed innovations; but only in a few instances were we able to ascertain that the information was effectively used or adequately disseminated to the GOP or the Pakistani farmer. Many USAID sponsored research and survey reports relevant to the agricultural sector disclose techniques to conserve moisture, terrace land and nurture new crops that could help alleviate some of the farmer's deficiencies that contribute to low productivity. Even though very little study of the barani areas has been undertaken, many known techniques could probably help the barani farmers combat erosion and the run-off of rainfall aggravated by the hilly and mountainous terrain. However, there seems to be an information gap between the source of the available researched data and the farmer.

It is our opinion that the methodology employed by USAID to assimilate and disseminate the beneficial results of research activities could be improved by instituting an index system; a reference procedure whereby the benefits of tested researched innovations are efficiently recorded and readily available for Mission use in its project planning process or for dissemination and beneficial exploitation.

> Recommendation No. 3: USAID should augment its reference file-system with a procedure for compiling and evaluating researched data; a system that would include an effective mechanism for the promulgation of tested practices.

2. On-Farm Water Management

Research in water management covers a broad spectrum of activities. Many water management activities were included in prior USAID assistance efforts. An April 1959 ProAg on Project No. 391-11-025 advocated research in various irrigation methods, including sprinkler, gated pipes and furrow: "... to determine adaptability under Pakistan conditions ..." A project objective was to train local personnel in improved practices, methods and techniques. A November 1969 PIP for Project 145, Agriculture Area Development, defined watercourse rehabilitation efforts in a manner almost identical to that reflected in the newly proposed Shadab Project. The PIP indicated that pertinent preparatory actions had already been initiated in March 1969 and physical implementation was scheduled to begin in July 1969 and completed in June 1970.

We also noted that designing, conducting and evaluating essential experiments in "soil-water-plant relationship," comparable to proposed activities in active and proposed projects, were to begin in July 1965 and end in June 1970. Lack of pertinent documentation precludes determining what was achieved and whether such achievements are being taken into consideration when developing new related projects.

A regional funded contract (AID/csd-2162) negotiated in June 1968 between AID/Washington and the Colorado State University (CSU), prompted a resumption of water management assistance to Pakistan. Pursuant to contract terms the CSU staff visited Pakistan, during the initial 21 month period of the contract, to develop specific plans for research work in Pakistan. This culminated in Project 391-17-110-367 and a ProAg was signed on March 25, 1970, which provided for the implementation of four research studies; two assigned to the West Pakistan Agriculture University (WPAU) and one each to

the Punjab Agriculture Research Institute (PARI) and the Machinery Demonstration Unit (MDU) of Agriculture Engineering Directorate. CSU was to provide advisory assistance funded under the regional contract and therefore the ProAg did not provide dollar funding, nor did it provide local currency. It was anticipated that local funding would be forthcoming from an obligated fund of Rs.3.4 million which USAID was planning to release to the Agriculture Research Council (ARC) through a separate ProAg (Project 296.2). Project 367 is an integral part of Agriculture Research Project 296.2 requiring a close relationship with the ARC and ARCB on the part of the CSU advisor.

A prior review, as of September 30, 1972, of the Water Management Project 367 and the related CSU contract activities, was covered in our audit report No. 73-21, dated December 14, 1972 and reflects weaknesses in project planning, implementation and evaluation. Effective coordination between the CSU advisor and the ARC was not evident. Two of the four research studies included in the ProAg and assigned to WPAU did not commence. The report also indicated the need for the Mission to carefully consider host country's capacity and desire to make effective use of advisory assistance. Very little improvement in the conduct of the project was noted during our current review. However, two studies are continuing satisfactorily, funded from their own regular budgets.

As yet there has not been compliance with the ProAg provision requiring a joint evaluation of the project, which would be an effective means of formalizing essential action to strengthen the project.

> Recommendation No. 4: USAID should initiate action for a joint evaluation of the project by all parties concerned (CSU, WPAU, PARI, MDU, and ARCB) with particular attention focused on the need for adequate financing and delineation of responsibility in each of the project areas of coordination, implementation, monitoring, progress reporting and evaluation.

The assignment of CSU advisors to research activities in Pakistan and their arrival appears to be premature. The first advisor arrived in August 1970 and because projected research was late in getting started he initially devoted a considerable amount of time to other activities than the intended specific research advisory work. Two CSU advisors arrived in Pakistan in August 1972 and a third in October 1972. It was anticipated that they would participate in new research project activities; namely, the Lysimeter studies, the Shadab project and the Mona project. The Lysimeter ProAg was not signed until February 26, 1973, the Mona ProAg as late as April 17, 1973, and the Shadab ProAg was signed May 2, 1973.

It is questionable whether the host country obtains maximum benefits from scientific advisory assistance when the services commence before a ProAg is officially approved and signed. Similar situations of inopportune visits by short-term advisors were also evident.

Mission commented:

> "Starting in 1968 CSU tried to develop projects in Pakistan with short-term TDY teams and due to the failure of that approach a full time research scientist was sent to Pakistan during August 1970. I feel it was the result of posting the full-time research scientist in Pakistan that CSU has a program today. It has been stated the three additional team members should have waited until the ProAgs were signed. The technical inputs of those men were most useful during the development of the projects."
>
> Further stating that in the absence of full-time research personnel, meaningful ProAgs probably never would have been prepared as project development heavily involve personality factors and having the men on board has provided that valuable orientation and setting-in period which fortunately in this case also coincided with the documentation development and processing time.

Mission's initial difficult position in the matter of advisors provided under a regional contract is understandable; however, it is apparent that better coordination in determining appropriate arrival and commencement of assignments by advisors is desirable.

We question the research scientists' involvement in the preparation of ProAg documentation and preproject development and believe that the host country realizes maximum benefits from agricultural research advisors when their expertise is utilized where essentially needed. We are of the opinion that documentation and preliminary project negotiation capability is available within the Mission.

> Recommendation No. 5: USAID should coordinate more effectively with AID/W the assignments and arrival of advisors to coincide with GOP's ProAg approval and project-readiness for maximum benefits.

The research activity sites referred to in the Water Management Research project were located at Lyallpur where suitable USAID-owned accommodations were available; however, the advisor resided in Lahore until transferred to Islamabad in 1972. Similarly, the present CSU team is headquartered in Islamabad, a substantial distance away from the new project sites at Lahore, Mona and Shadab. To assure maximum benefits, the Mona Project Director expressed a preference for locating CSU advisors at the site and is prepared to provide suitable living accommodations at Mona.

> Recommendation No. 6: USAID should assess the advantages of locating advisors within proximity of the activity sites and take action to facilitate their relocation as appropriate.

The CSU contract is regionally funded and although not a direct Mission activity, USAID does provide the logistics support. Contract monitoring and evaluation is the responsibility of the Technical Assistance Bureau (TAB), AID/Washington. However, it was mutually agreed to integrate the CSU research activities into the Mission's research assistance program to coordinate strategy and performance by the Mission and the CSU officials. The CSU staff works closely with USAID but is not required to submit progress reports to USAID nor did TAB delegate any part of their monitoring function to USAID. For more effective coordination the CSU-USAID relationship should be formalized into more specific terms of reference. Periodic progress reports from the CSU field staff to the Mission would foster better coordination between CSU performance and related Mission activity.

> Recommendation No. 7: USAID should initiate action to formalize a more effective rapport with TAB and CSU to ensure the receipt of

periodic progress information on CSU activities in Pakistan.

3. Land Leveling

USAID involvement in the improvement of agricultural productivity in Pakistan dates back to 1953 and land leveling has been one of many assistance efforts. To a varying extent land leveling activities were included as objectives in the following projects;

Project Number and Title		Implementation Period
391-11-110-019	Agriculture Research and Demonstration	1953-57
391-11-025	Agricultural Organization	1954-60
391-11-110-101	Agricultural Improvement	1960-64
391-11-120-145	Agriculture Area Development	1963-71
391-17-190-309	Land Forming Demonstration	1969-Current

Since we were unable to obtain relevant reports on the progress, evaluation and completion of all five of the projects or pertinent information on the performance of the advisors, it is not possible to adequately determine what problems were encountered or achievements accomplished under each one of the projects.

The currently advocated tractor-drawn small soil scraper was originally introduced in early 1969 by a USAID Agricultural Engineering Advisor. The advisor assisted Pakistanis in the scraper's fabrication; held demonstrations; trained government personnel in its use; and published a manual of instructions on farm surveying, staking and leveling. In the advisor's opinion the scraper was comparatively cheaper in cost and better in performance than the commonly used bulldozer. The activity (Project 145) was satisfactorily completed in FY 1971 and the advisor was transferred to another post. The advisor returned to Pakistan in January 1972 and resumed advisory assistance similar to that which he formerly rendered under Project 145. The resumption of activity is being financed under an obligation of Rs.62,000, Section 402, U.S.-owned local currency.

We were informed by USAID that this land-leveling activity financed from Section 402 funds is promoting an awareness among the farmers and the GOP that there is a need for precision-leveled farms in order to conserve water and grow a better crop. The activity includes the purchase of

land leveling equipment for training and demonstration purposes. Contacts are made to create an interest in precision land leveling and to demonstrate its effectiveness. It has been an ad-hoc operation, the effort was not institutionalized nor was adequate formal planning initially introduced.

The failure to properly institutionalize this initial precision leveling effort and the need for a formalized approach may have retarded what probably could have been a more successful introduction to a new land forming concept. Very few of the Agriculture Department demonstration farms are properly leveled. We believe that had the promotion of precision leveling been exploited more effectively through government demonstration farms, the concept would have had a better implementation acceptance.

Relevant to land leveling, a July 1972 Mission letter reads, in part: "Unfortunately years ago some Americans proposed the use of bulldozers to replace the bullock powered land leveling activity. They obviously did not stop to realize what a long-term disservice they were doing for Pakistan." Our review of Project 309, Land Forming Demonstration, disclosed a somewhat similar disservice. Upon Mission's suggestion, the GOP purchased a large self-loading soil-moving scraper for the purpose of demonstrating proper land formation. The Mission advisor while monitoring the procurement of the large scraper under Project 309, also advocated the use of a small locally fabricated soil scraper under Project 145, Agriculture Area Development. The Mission is now of the opinion that the large scraper is uneconomical and unsuitable for land leveling in most farming areas within Pakistan. On August 14, 1971, the Mission's Agriculture Division indicated that the large scraper should be replaced with small scrapers. However, it was not evident that such replacement action was suggested to the project authorities. It therefore appears that initially the Mission was too hasty in recommending the large scraper. Also, it has failed to motivate project officials to transfer and utilize the large scraper in other than farm areas.

> Recommendation No. 8: USAID should take a more determined position on the transfer and utilization of the large scraper, possibly in the building of dams, roads, or other heavy construction work.

Further on the subject of land leveling, a Mission PROP prepared in January 1973 indicated that only 10 to 12 per cent

of Pakistan's 33 million acres of irrigated farms can be considered as properly leveled. This is indicative of the need for more effective advisory service and assistance in furthering the precision land leveling (PLL) concept. The Mission contends that:

1. Farm survey is not conducted with appropriate mechanical equipment. Usually, the level of the farm is judged with the "eye".

2. Most farmers use traditional bullock-drawn equipment to level their farms.

3. Even in cases of mechanical farm leveling, the farmer uses a bulldozer which cannot produce the desired precision. (Farmers and government officials informed us that the bulldozer is not used to achieve precision but is used essentially to level excessively rough terrain. It was stated that the high operational cost of the bulldozer is an assurance against its indiscriminate usage.)

Since the Mission attaches a high priority to the land leveling activity, it originally proposed in mid 1972 a large scale PLL project. The Project was based on the assumption that the value of increased food production derived through PLL would far exceed the cost of PLL. However, since AID/W and the GOP did not give adequate support to the proposed large project, agreement was reached to sponsor a comparatively smaller two-year fact finding project, which culminated in the January 1973 Mission drafted PROP. The PROP emphasized the need to train provincial agriculture department personnel in surveying, staking and leveling farm land to the desired precision. Also, it proposes that in connection with the training activity, cost-data should be accumulated to confirm the need for implementing a significantly larger PLL program.

As indicated in the Project Documentation section of this report, the USAID is currently developing the documentation essential to effectively formalize a land leveling program. Two PC-1 documents, one for the Punjab and the other one for the Sind Province, propose a scheme to develop and establish an operation "precision land leveling" service/cadre in each of the two provinces at a cost of Rs.2,753,600 ($278,000) per province.

During our field visits we noted a very limited availability of PLL equipment. This may have a retarding effect on

promoting the new PLL technique. Either public or private sponsored equipment-pools should be accessible to the farmers and utilization cost commensurate with the anticipated increase in profit attributed to land leveling.

Both technicians and farmers have indicated that the desired maximum benefits from precision land leveling cannot be realized without other modern agricultural practices and improved inputs. Consequently, the shortage of chemical fertilizer (ANNEX III), becomes a relevant factor.

Most farmers with whom we visited, welcome the PLL concept, especially if their land can be leveled at a subsidized cost; but PLL will be desired by all the farmers when cost-benefit data confirms its advantages. We, therefore, urge that USAID grant a high priority to the cost-benefit study in its PLL research assistance. This can be accomplished within the framework of the existing and proposed projects.

Recommendation No. 9: USAID should:

(1) exert initial effort, in the implementation of the proposed precision land leveling (PLL) project, on the compilation of cost-benefit information; and

(2) with careful consideration to the non-availability of other agricultural inputs that are necessary to ensure maximum PLL benefits, utilize the cost-benefit data to determine whether the continuation of the PLL activity is feasible.

In commenting on the draft of this report the Mission stated:

> "The recommended proposal is naturally "good" however, the AAG staff should remember the two year activity is specifically proposed so fields will be leveled and new agronomic practices introduced thereby providing a basis for determining cost-benefit relationship. The SCS team includes an Agriculture Economist to implement the recommended activities. Paragraph (b) seems less meaningful as many benefits of PLL, such as decreasing the quantities of irrigation water required, will be obtained with or without the input of fertilizer."

We acknowledge the need for a reasonable time-frame in which to accomplish a cost-benefit study; however, we are particularly interested in stressing the importance of ascertaining whether the Mission has undertaken a feasible project before it proceeds into the contemplated large scale precision land leveling activity.

D. Coordination

The GOP in search for improved cultural practices, techniques for balanced agricultural inputs and experienced advisors, draws on the technical expertise and financial assistance of other donors, in addition to that of the United States.

In this respect we noted that the Government of Canada, through the Colombo Plan Administration, carried out aerial photography and a resource survey in West Pakistan in 1952. Based on this survey the GOP formulated plans for soil conservation and requested U.S. technical assistance. The Colombo Plan was again active in the 1960s in providing wheat seeds and arranging experiments and demonstrations for new varieties to assist the GOP in their quest for self-sufficiency in wheat production.

The United Nations Development Program (UNDP) participated in establishing a Soil Survey Unit in Pakistan as a fully independent and effective entity. The Soil Survey Unit is expected to engage in a survey of the natural resources of the Northern Regions of Pakistan under a recently executed UNDP project agreement. United Nations Development Programs are formulated by the GOP in cooperation with various specialized agencies of the United Nations system. The Country Representative of the U.N. Food and Agriculture Organization (FAO) in Islamabad stated that U.N. assistance is contemplated for:

(a) Livestock Development Center, Bahadur Nagar.
(b) Artificial Insemination Scheme, Rawalpindi.
(c) Cotton Research Institute, Multan.
(d) Sugarcane Research Center, Sind.
(e) Survey of National Forestry Resources, N.W. Frontier.
(f) Groundwater Exploration, Baluchistan.
(g) Cultivation of Sugar Beets, N.W. Frontier.
(h) Sheep and Wool Production Research, Baluchistan.
(i) Soyabean Cultivation Research, N.W. Frontier.
(j) Sprinkler Irrigation Project, Rawalpindi.
(k) Integrated Rural Development Activities.

With regards to the FAO proposed assistance activities, we noted that a USAID project, Agricultural Development, in the

early 1960s provided assistance in developing Plant and Animal Sciences and covered activities similar to those contemplated by FAO:

(a) Support of poultry improvement projects.
(b) Improvement and reconstruction of buffalo bull farm at Bahadur Nagar.
(c) Support of sheep farm in Baluchistan for the production of stud rams.
(d) Improve vaccine producing laboratories.
(e) Forest management.
(f) Water Management - - including sprinkler, gated pipe and furrow methods of irrigation.
(g) Research Support - - including seed multiplication, hybrid maize and a certified seed potato program.

A recent Information Memorandum for the A.I.D. Administrator (March 2, 1973) and a related circular cable stress the importance of effective USAID coordination with UNDP Resident Country Representatives as a means to (1) improve working contacts, (2) strengthen the method by which the host country can set and select its priorities for technical assistance and (3) support the assistance provided by both A.I.D. and UNDP.

We were advised that an informal relationship exists between the USAID agriculture technicans and their counterparts in the UNDP, and with members of the Ford Foundation, for the exchange of ideas at the working level. USAID and other donor specialists meet occasionally to discuss matters of mutual interest to preclude duplication of effort. However, USAID maintains no record of such informal meetings and we could not determine whether the contacts were really effective. We believe that a memorandum for the files should reflect pertinent data of mutual concern. A convenient means of reference should be established which would facilitate the use of such information whenever desired. This information is particularly significant whenever two or more donors are engaged in or contemplate assistance activities of a similar or related nature. On at least one occasion both USAID and another donor were requested by the GOP for crop advisory assistance and for lack of a timely exchange of information or relevant documentation, action on the part of the two donors to fulfill the request had been initiated, but fortunately the duplication was discovered before the advisors were posted.

Recommendation No. 10: USAID should reexamine its mode of rapport with other donors and strengthen relevant procedures to assure maximum benefits to the host country.

Through its membership in the Consortium, USAID maintains close coordination with the other members of the organization. The World Bank presides over the Consortium and as part of its overall activities closely monitors and analyses economic development in Pakistan. Reports, based on rather comprehensive reviews, serve as background and guidelines for the members.

Coordination with the GOP requires maintaining an on-going dialogue with concerned officials within various bureaus of the agricultural hierarchy. Changes in key personnel, attributed to the restructuring of the GOP, necessitate reestablishing good liaison relationship every time a new official is appointed. We have accentuated in prior reports the need for a more effective relationship with the GOP during the planning and project formulation stages of providing assistance. It was indicated in Report No. 73-21, Water Management Research, that effective cooperation had been lacking because of many impeding factors, including political unrest and the division of West Pakistan into four provinces.

Within USAID, good coordination in the planning of projects was apparent. The interrelationship between functional units was effectively strengthened recently when USAID management formalized a procedure for the review and expeditious clearance of Mission initiated project documents.

PART V

GENERAL COMMENTS

A. USAID's Agriculture Sector Analysis and Proposed Goals

Fiscal year 1973 is looked upon as a period of transition within Pakistan and A.I.D. support is predominantly in the form of commodity loans and PL 480 assistance. Strong emphasis on sector lending is USAID's development assistance focal point for FY 1974 and overall strategy in the agriculture sector is primarily directed towards:

(a) Increasing efficiency of water use on farms.
(b) Providing assistance in the rainfed areas.
(c) Furthering agricultural research.

Since the nation's goals and proposed methods for attaining the goals, at this juncture of transition, are only partially defined, they cannot be adequately or effectively analyzed by USAID for the purpose of formalizing detailed assistance programs and related implementation techniques.

USAID's proposed strategy for FY 1973, as prepared in July 1971 included the East Wing, and was comprised of a series of analytical papers. USAID tried to deal realistically with problems of an uncertain future in Pakistan, a country that was on the brink of a serious economic decline and dislocations. Civil disobedience prevailed in former East Pakistan and the GOP's unilateral implementation in May 1971 of a moratorium on debt service resulted in a cessation of new commitments for economic assistance. In July 1971 when formulating the FY 1973 agriculture assistance proposal, USAID addressed itself to three basic issues:

(i) need to develop new technology through strengthened agricultural research;

(ii) need for more rural jobs; and

(iii) need to reverse, or at least to mitigate, the tendency toward a growing disparity in agricultural development among regions and toward growing inequalities between large and small farmers.

However, historical events precluded program implementation and not only A.I.D. but the Consortium and the GOP had to begin anew and FY 1973 emerged as a transition year.

The aftermath engendered an Agriculture Sector Analysis paper (Final Draft dated June 23, 1972) in which USAID attempted to sort out the major issues and constraints associated with efforts to increase production in the agriculture sector within a reduced Pakistan. The main objective of the analysis exercise was to identify a limited number of major problem areas that lend themselves to concentrated large scale assistance efforts with the potential of a substantial impact. The paper acknowledges the fact that analysis is a continuing process, and that conclusion and hypotheses reflected therein must be adjusted as new information and further analysis warrant modification.

In brief, the Agriculture Sector Analysis paper reflects the following:

(a) Crop production, livestock production, use of inputs and other indices show

growth but the statistics obscure issues that are cause for concern; significantly, the high rate of population growth.

(b) Stepped-up research is needed to provide a continuing stream of new technology to assure sustained increase in productivity.

(c) Research and large scale operational programs must be mounted to improve efficiency in the use of water, since the practical limits of mobilizing the available water resources for irrigation will likely be approached early in the decade of the 1980s.

(d) Major attention must be focused on getting increased productivity in the less advantaged areas, such as the rainfed (barani) regions.

(e) To the extent feasible, institutions, tax policies and development programs must be skewed to eliminate, or at least mitigate, any forces that may tend to widen the gap of inequalities between the rich and poor farmer.

(f) Nutrition considerations dictate the need to explore ways to expand production of pulses and oilseeds.

(g) With rapid production growth, the farm labor force continues growing and therefore every possible avenue leading to potential new rural jobs must be explored.

(h) The GOP should develop a framework for agricultural policy analysis; with particular attention to the constraint on agricultural development posed by the seeming inability to create viable local governmental or other types of organizations to implement development activities, and the need to formulate an export strategy for agricultural commodities.

The sector analysis paper was presented as the basic document in support of two subsector loan proposals:

(i) A water management subsector proposal designed to improve the use of water on farms.

(ii) A subsector loan for agricultural research aimed at getting improved organization of agricultural research and markedly increased investment of talent and financial resources in agricultural research.

The analysis paper also made reference to USAID's interest in developing for FY 1974 or later: (i) a research and action program to improve barani agricultural development (initial emphasis in the Northwest Frontier Province), and (ii) rural electrification.

B. In Retrospect

The food supply in Pakistan must double by the beginning of the twenty-first century to maintain current standards of nutrition - - yet today the great part of Pakistan's population is malnourished. The results of past achievements in agricultural growth have not advanced the meager subsistence level of the masses. The rate of modernization and increased productivity in agriculture is inadequate in view of the population explosion. The 1972 census reflects a 51.33 per cent population increase over the 12 year period from 1961 to 1972. This is an annual growth rate of about four per cent, which is among the highest in the world.

It is clearly evident that the population crisis warrants a high priority and concerted effort to drastically moderate the birth rate. In our opinion, until the Family Planning Program, which is now being provided technical and financial assistance by USAID, reducesthe birth rate considerably, internal and external assistance to improve agriculture production will not be adequate to achieve the desired self-sufficiency in food productivity on a sustained basis.

C. Prior Audit Coverage

The agriculture assistance projects have had a consistently thorough internal audit coverage by the staff of the Area Auditor General and the predecessor USAID/Controller's internal audit staff. A compilation of audits performed on USAID agriculture activities since 1956 reflects a total of 84 audit reports. A prompt implementation by the Mission of our audit recommendations was evident and as of March 31, 1973, only four recommendations were open - - all in the less than six-month outstanding category.

During January and February 1973, a two-man audit team from the General Accounting Office reviewed the A.I.D. assistance program in Pakistan. The draft of a proposed report, which was presented to the USAID for review and comments, presents a favorable resumé of the agriculture activities in which the USAID is currently engaged.

EXHIBIT A

PAKISTAN

AREA

PROVINCE	MILLION ACRES	THOUSAND SQUARE MILES
BALUCHISTAN	85.20	133
PUNJAB	50.91	80
SIND	37.42	58
N.W.FRONTIER	25.77	40
TOTAL	199.30	311

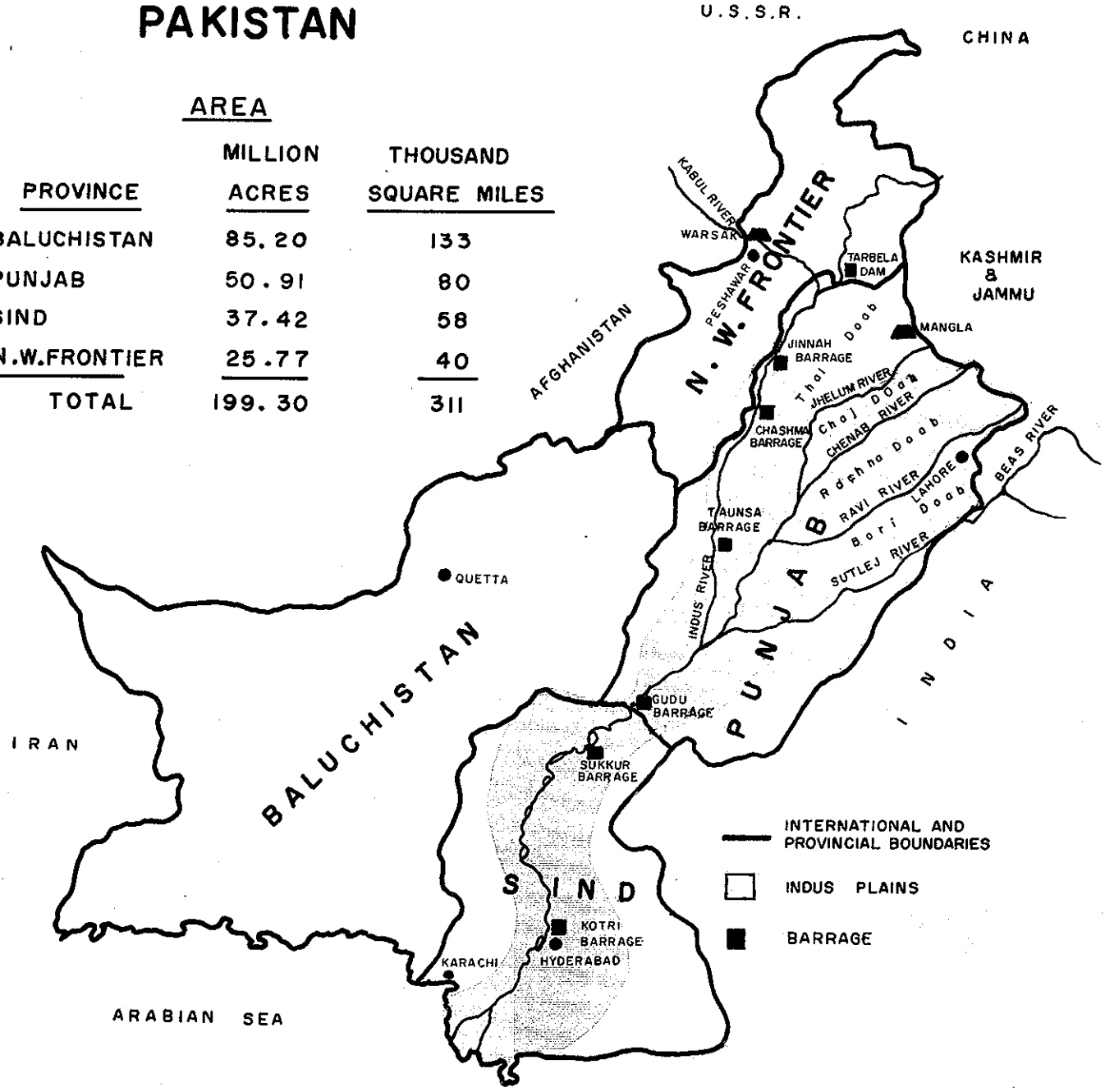


EXHIBIT B

REPORT ON UNITED STATES ASSISTANCE TO THE AGRICULTURAL SECTOR PAKISTAN

Government of Pakistan Annual Development Program 1972-73

(In Millions of Rupees)

	Sector	Punjab	Sind	NWFP	Baluchistan	Center	Total
1.	Agriculture	200	69	51	21	44	385
2.	Water	156	65	47	26	47	341
3.	Power	-	-	-	-	802	802
4.	Industry	3	1	4	1	191	200
5.	Fuels and Minerals	-	-	-	-	83	83
6.	Transport and Communications	95	50	23	25	537	730
7.	Physical Planning and Housing	80	42	19	12	78	231
8.	Education	115	68	28	12	48	271
9.	Health and Family Planning	70	15	27	15	13	140
10.	Social Welfare	5	1	1	-	2	9
11.	Manpower	5	1	1	-	1	8
12.	P.W.P. Including Rural Works Program	60	8	11	9	8	96
13.	Development Corporation for Tribal Areas	-	-	-	-	16	16
14.	Miscellaneous Programs	-	-	-	-	56	56
	Gross Total	789	320	212	121	1926	3368
	Less Operational Shortfall	-	42	-	-	-	42
	Net Total	789	278	212	121	1926	3326
	Indus Basin/Tarbela	-	-	-	-	824	824
	GRAND TOTAL	789	278	212	121	2750	4150

Exchange Rate (March 31, 1973): 9.90 Rupees = $1.00

EXHIBIT C

REPORT ON UNITED STATES ASSISTANCE TO THE AGRICULTURAL SECTOR PAKISTAN

SUMMARY OF U.S. ASSISTANCE COMMITTED TO THE AGRICULTURAL SECTOR AND RELATED ACTIVITIES 1952 TO MARCH 31, 1973

(In Millions of Dollars)

	Loans	Grants	Total
Projects	47.5 1/	35.4 1/	82.9
Fertilizer	125.6 2/	33.3	158.9
Indus Basin	171.2	530.6 3/	701.8
Total:	344.3	599.3	943.6 4/

1/ Includes the equivalent of 8.6 million dollars in loans and the equivalent of 3.6 million dollars in grants of section 104-F rupees converted at Rs.11.00 to one U. S. dollar.

2/ Includes the equivalent of 9.6 million dollars of Cooley Loans - - rupee denomination loans converted at Rs.11.00 to one U.S. dollar

3/ Includes the equivalent of 235 million dollars of U.S. owned local currency contributed during the period from 1962 thru 1967 and converted at the then prevailing rate of Rs.4.8 to one U.S. dollar.

4/ Of the $943.6 million, approximately $900 million had been disbursed as of March 31, 1973.

REPORT ON
U. S. ASSISTANCE
TO THE
AGRICULTURAL SECTOR
PAKISTAN

EXHIBIT D

USAID AGRICULTURE AND RELATED GRANT PROJECTS
1952 THROUGH MARCH 31, 1973
(In Thousands of Dollars)

Project No.	Project Title	Duration FY Initiated	Duration FY Terminated	Amount U.S. Dollars	Amount Rupees in $ Equivalent 1/	Totals	
ACTIVE PROJECTS							
391-17-110-296.2	Agriculture Research (Washington State University Contract)	69	Current	387	309		
391-11-110-387	Water Management Research	70	Current	-0-	-0-		
391-17-190-309	Land Forming Demonstration	69	Current	-0-	45		
391-11-119-320	Agriculture Technical Support	-	Current	1,420	9		
391-11-780-037.1	Agriculture Census	71	Current	184	-0-		
391-11-120-145	Agriculture Area Development	63	Current	1,914	-0-		
	TOTAL ACTIVE			3,905	363	4,268	
COMPLETED PROJECTS							
391-11-015	Locust Control	53	53 2/	59	-0-		
391-13-022	Plant Protection	54	60 2/	753	-0-		
391-11-110-019	Agriculture Research and Demonstration	53	57 3/	1,012	-0-		
391-11-025	Agricultural Organization	54	60 3/	-0-	-0-		
391-11-110-101	Agricultural Improvement	60	64	607	-0-		
391-11-120	Agriculture Research	61	64	272	-0-		
391-11-121	Animal Husbandry	60	62	17	-0-		
391-12-027	Soil and Water Conservation	54	60	494	-0-		
391-12-030	Baluchistan Sailaba	54	59	77	-0-		
391-12-031	Range and Pastures	54	59	53	-0-		
391-11-120-018	Ground Water Exploration	53	54	188	-0-		
391-11-120-035	Ground Water Survey	54	64	4,608	-0-		
391-32-190-187	West Pakistan Agriculture	62	64	-0-	740		
391-11-120-254	Land and Water Use (Mona Housing)	65	69	213	-0-		
391-11-120-257	Hydrologic Monitoring	66	72	440	-0-		
391-17-110-263	Improved Wheat Seed Mult.	66	67	-0-	3		
391-11-190-306	Agriculture Demonstration Equip.	69	69	-0-	1		
391-11-190-334	Rodent Control Demonstration	69	69	-0-	15		
391-12-058	Water Resources Advisory	54	60	134	-0-		
391-32-190-028	Taunsa Barrage	54	60	5,894	-0-		
391-18-011	Fish Harbor and	55	58	472	-0-		
391-18-054	Fisheries Development	55	58	560	-0-		
391-18-096	Fisheries Development	59	64	99	-0-		
391-66-009	Inter College Exchange 4/	63	69	-0-	-0-		
	a) Colorado State University Peshawar	-	-	1,785	-0-		
	b) Washington State University	-	-	5,560	-0-		
	c) New Mexico University	-	-	39	-0-		
391-11-660-146	West Pakistan Agric. University	69	72	2,115	2,475		
391-11-170-151	Forest Range Management	63	68	415	-0-		
391-12-016	Bolan Dam	53	54	75	-0-		
391-32-120-017	Makhi Dhand Reclamation	53	58	820	-0-		
391-19-029	Agricultural Workshops	54	61	1,026	-0-		
391-15-034	Modern Storage of Foodgrains	54	62	126	-0-		
	TOTAL COMPLETED			27,913	3,234	31,147	
FERTILIZER - PROCUREMENT							
391-13-002	Acquisition and	52	52	900	-0-		
391-13-010	Distribution of	53	53	3,699	-0-		
391-13-021	Fertilizer	54	57	5,966	-0-		
	TOTAL			10,565	-0-	10,565	
FERTILIZER - PRODUCTION							
391-23-007	Fertilizer Factory	52	60	12,804	-0-		
391-23-107	Fertilizer Plant	-	61	10,000	-0-		
	TOTAL			22,804	-0-	22,804	68,784

1/ Does not include Rs.1.1 billion (equivalent to $102 million) grants to Indus Basin under Section 104-f nor counterpart rupee grants.
2/ Combined with Project No. 101.
3/ Combined with Project No.025
4/ University education included in early stage of the project assistance to College of Home Economics and Engineering. Later efforts were focussed on education in agriculture, including research and extensions.

Source: Controller's Program Status Report.

Rupees 11 =$1.00

REPORT ON
UNITED STATES ASSISTANCE
TO THE
AGRICULTURAL SECTOR
PAKISTAN

EXHIBIT E

AGRICULTURAL PROJECT ASSISTANCE
AS OF MARCH 31, 1973
(In Thousands of Dollar)

	Project No. and Title	Obligated	Expended	Unliquidated Balance	Sec.402 US-Owned Local Currency Converted @ Rs.11 = $1.00	
1.	391-17-296.2 (ProAg 71-14 dated 2/15/71) Agricultural Research, West Pakistan	387	274	113	$ 309	
					(236)	a/
2.	391-17-110-367 (ProAg 70-23 dated 3/25/70) Water Management Research	- b/	-	-	-	c/
3.	391-17-120-389 (ProAg 73-2 dated 2/5/73) Farm Water Management Research (Lysineter Studies)	- b/	-	-	-	d/
4.	391-17-110-390 (ProAg 73-4, in draft) Punjab Water Management Research (SHADAB)	- b/	-	-	(91)	a/
5.	391-17-110-391 (ProAg 73-5 dated 4/17/73) Water Course Management Research (MONA)	- b/	-	-	(182)	a/
6.	(ProAg not yet Developed) Gidder Valley Agriculture Research Development	-	-	-	(91)	a/
7.	391-17-190-309 (ProAg 69-12, dated 2/13/69) Land Formation Demonstrations	- e/	-	-	45	
8.	391-17-110-388 (ProAg 72-13 dated 2/24/73) Feasibility Study of Potential for Groundwater Development in Gidder Valley	-	-	-	18	
9.	391-11-119-320 Agriculture Technical Support	1,420	1,320	100	13	f/
10.	391-11-780-037.1 (ProAg 71-1 dated 10/12/70) Agriculture Census	184	143	41	-	
11.	391-11-110-145 (ProAg 70-25 dated 2/27/70) Agriculture Area Development	1,914	1,912	2	-	
	TOTAL	3,905	3,649	256	385	

a/ Represents additional funding provided through ProAg 71-22, revision dated April 5, 1973, subsequent to our audit cut-off date (Details shown in Part IV, Project performance, Agricultural Research.

b/ Dollar assistance is being provided under regional funded Contract AID/csd-2162 with the Colorado State University (CSU).

c/ The ProAg implied that rupee funding would be forthcoming from local currency obligated for Project 296.2.

d/ Local currency funding not required.

e/ Advisory assistance furnished through direct-hire technician under Technical Support Project #320.

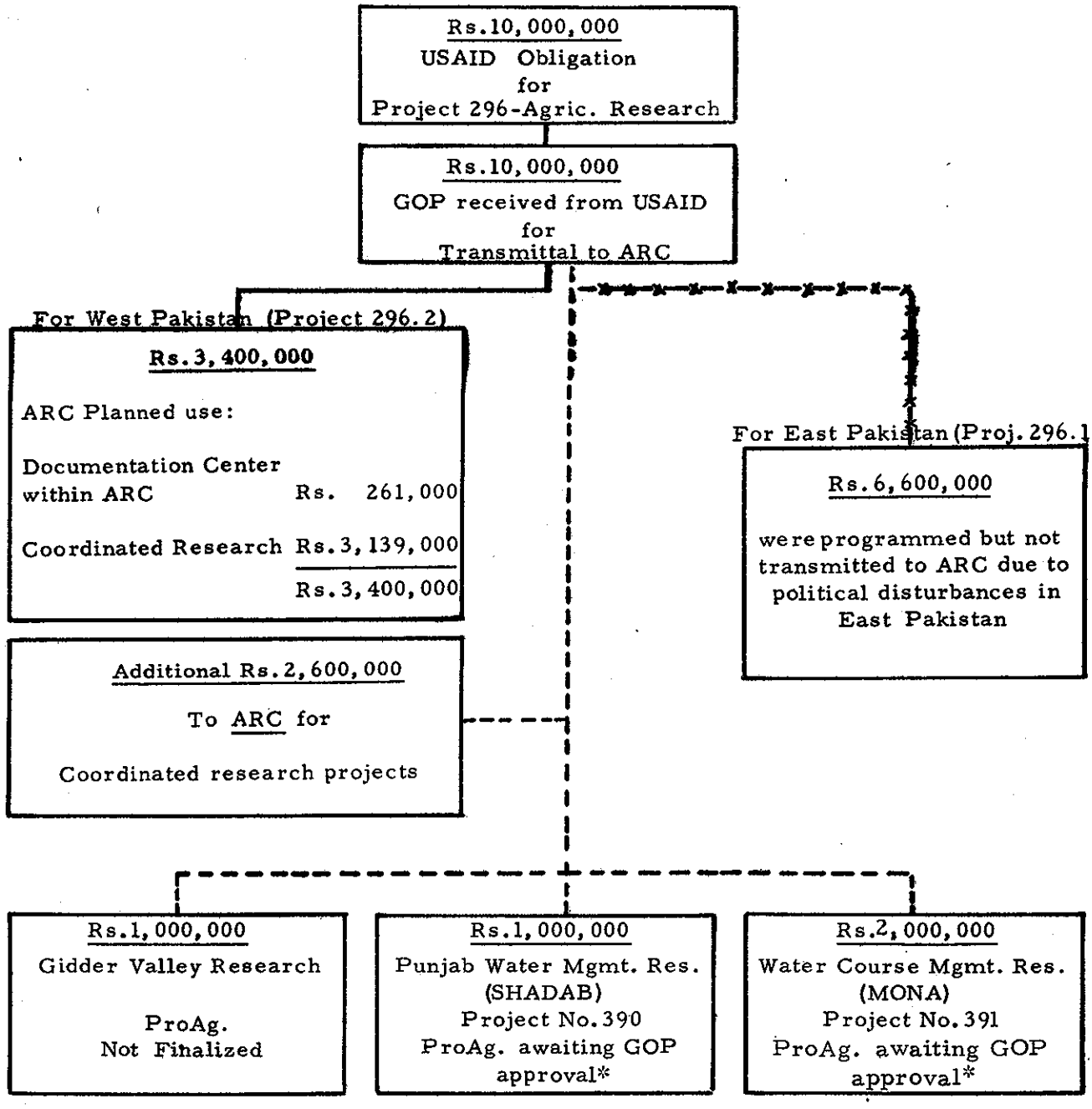
f/ Includes funding for land leveling activities.

REPORT ON UNITED STATES ASSISTANCE TO THE AGRICULTURAL SECTOR (PAKISTAN)

AS OF MARCH 31, 1973

FLOW CHART OF MONDALE FUNDS
AGRICULTURAL RESEARCH
PROJECT 391-19-110-296.2

EXHIBIT F



Funds flowed to ARC per original ProAg.

Funds allocated in the ProAg. but not released to ARC.

Funds reprogrammed by USAID. ProAg. Revision signed by GOP on April 5, 1973.

*Subsequent to audit cut-off date, MONA was signed April 17 and SHADAB May 2, 1973.

EXHIBIT G

REPORT ON UNITED STATES ASSISTANCE TO THE AGRICULTURAL SECTOR PAKISTAN

As of March 31, 1973

DISTRIBUTION OF REPORT

	No. of Copies
A.I.D./W	
AG/AUD	4
AG/AUD/PP	1
AA/ASIA	2
ASIA/NE/P	1
AA/SER/CM	1
AA/TA/AG	1
AA/TA/RUR	1
STATE	
IGA	1
IIS/NEW DELHI	1
USAID/PAKISTAN	6
AAG/NE	2

REPORT ON UNITED STATES ASSISTANCE TO THE AGRICULTURAL SECTOR PAKISTAN

THE INDUS BASIN PROJECT

The Indus Basin Development Project (EXHIBIT A) was initiated in 1960 to solve a water dispute between India and Pakistan which began when the two countries were divided in 1947. The development includes two earth-filled dams (Mangla and Tarbela), considered to be among the biggest of its kind in the world, and a sophisticated water transfer system which will increase irrigation water by 80% and more than quadruple the power generating potential of Pakistan.

Ten developed countries have joined Pakistan in financing the project. The funds are administered by the World Bank. The United States is supplying about 40% of an estimated $2.2 billion total cost. Through May 10, 1973, U.S. has disbursed $419 million in dollar grants and loans, plus rupees 1.12 billion of local currency grants ($235 million @ Rs.4.8 to $1.00); which has been channeled through the World Bank and is subject to World Bank rather than U.S. foreign aid regulations.

After the subcontinent was partitioned India began to divert water from three easternmost rivers which endangered irrigated agriculture in Pakistan. Pakistan's immediate protest led to negotiations which began in 1952 and ended in 1960 in a satisfactory solution with the signing of the Indus Water Treaty. The treaty sanctioned India's diversion of the waters of the three eastern rivers for its own use. In return, Pakistan received substantial foreign aid for the construction of two large storage dams on the western rivers to conserve the flood waters of the rainy season for irrigation when the rivers run low. The treaty also provides for a sophisticated series of inter-river link canals to feed water more effectively to the irrigation canal system developed by the British in the 19th Century (ANNEX II).

Two storage dams are the centerpieces of the Indus Basin Project. The Mangla Dam on the Jhelum River southwest of Islamabad, completed in 1967, was one of the largest earth-filled dams in the world. Statistics on the Mangla Dam are now dwarfed by Tarbela, 70 miles northwest of Islamabad on the Indus and it is scheduled for completion in 1976.

Although the Indus Project was drawn up to preserve and improve irrigated agriculture in the arid Punjab, it will also provide tremendous power benefits from the Mangla and Tarbela Dams. Ultimately, power generators at Mangla will have a capacity of 1,000 megawatts; the capacity of Tarbela will be 2,100 megawatts. This contrasts with a power demand for all of West Pakistan of 327 megawatts when construction on Mangla commenced in 1963.

The irrigation and power benefits of the Indus Project meet in the Salinity Control and Reclamation projects (ANNEX II) where electric-powered tubewells pump irrigation water through seven million acres of agricultural lands.

REPORT ON UNITED STATES ASSISTANCE TO THE AGRICULTURAL SECTOR PAKISTAN

SALINITY CONTROL AND RECLAMATION PROJECTS (SCARPs)

The Salinity Control and Reclamation Projects encompass five geographical divisions within the Punjab Province. There are five major rivers in Pakistan and the land between the rivers is called Doab (EXHIBIT A).

In the late 19th Century the British were instrumental in the construction of a network of canals utilizing the waters of the five rivers. A considerable amount of water in this irrigation system is lost by evaporation and seepage and never reaches the root zone of the crops in some of the areas. Leakage from the extensive network of main canals, service canals and distributaries, along with field irrigation losses have served to increase the water table steadily over the years to a point where large areas had become water-logged. The situation was one of inadequate water for agricultural requirements, plus an ever increasing amount of land was lost to production every year due to water-logging and salinity. In 1954 it was estimated that 100,000 acres of land was being lost to salinity and water-logging every year. In view of this deterioration, the GOP initiated a survey of soil and water resources of the Indus Plain. This activity was supported by USAID under Project 391-11-120-035, Ground Water Survey. The GOP established in 1958 a Water and Power Development Authority (WAPDA) and entrusted it with the responsibility of preparing a comprehensive program to consider measures whereby a national catastrophe could be avoided and to overcome the ever increasing loss of irrigated lands to water-logging and salinity.

In May 1961, WAPDA published a report entitled "Program for Water Logging and Salinity Control in the Irrigated Areas of West Pakistan". Dr. Roger Revelle, a former Science Advisor to the U.S. Secretary of the Interior, and a team of renowned scientist were appointed by President Kennedy to perform a scientific investigation of the problem. The team examined the WAPDA plan in 1964 and endorsed the report as issued by WAPDA. The WAPDA published program featured not only the eradication and control of water-logging and salinity, but was essentially directed at maximizing agricultural production.

As recommended by the Revelle Team, a semi-autonomous Land and Water Development Board was established to coordinate and execute the development projects. WAPDA developed several projects for salinity control. U.S. financed a survey of the water logged saline area, helped set-up a laboratory for testing water and assisted in constructing tubewells to control salinity and water logging so as to improve the supply of water for irrigation.

SCARP-1, called Rachna Doab, the land between Ravi and Chenab rivers was the first area selected for development. The total number of tubewells planned and constructed in this area was 2,043; of which 1,800 were financed by USAID and 243 wells were financed by UN, FAO, Colombo Plan and the GOP.

A second area (SCARP-2 A & B) called Chaj Doab, which lies between the Chenab and Jhelum rivers, was planned for a total of 2,198 wells. A.I.D. financed 884 wells in SCARP 2-A and 800 in SCARP 2-B, and the GOP funded the construction of the remaining wells.

Of 1,585 wells planned for the Lower Thal Doab, the land between Jhelum and Indus rivers, Yugoslavia financed 542 and West Germany 523 wells.

The success story of the SCARP projects was readily evident in the crop yield increase noted very early in the expansion of the tubewell projects and progressively improved as more wells were constructed:

Yield Per Acre
(In Maunds -- A Maund = 82.28 lbs.)

	59-60 1/	63-64	64-65	65-66
Rice	10.55	13.32	16.51	24.18
Sugar Cane	26.35	30.50	40.10	48.70
Maize	8.85	10.62	12.00	22.73
Cotton	5.15	7.37	7.90	6.72
Wheat	8.66	10.12	13.77	14.96

1/ Before tubewells became operational.

However, the success of a GOP public program of such magnitude (which according to the June 1971 agricultural census influenced the private construction of 81,120 tubewells in the Punjab Province) is also interspersed with problem situations.

A USAID Site Inspection Report, dated February 5, 1973, states: "Approximately 750 tubewells have been passed for operation, the remaining 50 to 60 have either transformer, starter, motor, etc., problems that prevent operations." The purpose of the inspection was to review the status of implementation because the project was nearing completion. The project (SCARP 2-B) was financed under a $14 million AID Loan No. 391-H-087, signed December 30, 1966 -- $10 million had been disbursed as of December 31, 1972 against a September 30, 1973 terminal date of disbursement.

The inspection report also makes reference to a field trip made in September 1971 (17 months prior to the recent inspection) which disclosed that 500 wells were in operation and 300 would be in production in the very near future. At the late date of February 5, 1973 some 50 to 60 wells were still inoperative. With regard to problem areas, our Audit Report No. 70-7, dated September 30, 1969, reflected on maintenance and operation problems in the SCARP-1 tubewell area. In computing the economic feasibility of the wells, the planners projected 40 years as the operational utilization span of the tubewells; however, screens or strainers were failing in less than 10 years. Some of the wells had to be redrilled after 5 years of operation. Certain changes in fiber and design were instituted to alleviate deterioration. Furthermore, in our report we also commented on probable hydrologic changes attributed to private tubewell construction which generally served to skim the water because, as to salinity, it is superior at the shallower depth. Thus, we thought that the private wells could be counteracting the good effect of the public wells that are usually much deeper. In this context, during a U.S. Geological Survey performed in September 1972 consideration was given to the advantages and disadvantages of private tubewells, because as previously indicated the use of private tubewells for irrigation was increasing significantly.

Irrespective of the problems encountered, it is through the SCARP projects that A.I.D. has made one of its greatest long-term investments in Pakistan agriculture. The projects were begun in 1961 with heavy financial and technical support

from A.I.D. They were designed to counteract problems that had developed in the century-old irrigation system. Decades of seepage from canals had by the 1950's caused the water table to rise and waterlog farmland. Moreover, evaporation of irrigation water from the surface of the land caused heavy salt deposits which inhibited plant growth. The SCARP programs involved remodelling of canals and construction of tubewells to pump up excess groundwater and redistribute it over the surface. This has the effect of checking water-logging, washing surface salts out of the topsoil and providing extra irrigation water to increase crop yields. The SCARP areas have also been the testing ground for immensely successful new high yielding varities of seeds.

In November 1972 USAID received a letter from the Pakistan Water and Power Development Authority requesting A.I.D.'s approval to terminate on February 28, 1973 the services of the consulting firm engaged in tubewell electrification in the SCARP-2B area. USAID agreed, with the understanding that the project would be virtually completed by February 28, 1973; and this terminated A.I.D.'s direct construction contribution to the SCARP projects. The development and construction of tubewells continues without A.I.D. assistance and the contribution of water and power to the SCARP areas is one of the most important aspects of the Indus Basin project (ANNEX I).

A.I.D.'s and predecessor Agencies' financial assistance to the SCARP projects as of December 31, 1972 totaled $70.4 million:

SCARP Projects	$ (000)	$ (000) Equivalent of Rupees	Total
1	$15,539	$ -	$15,539
2	-	8,512	8,512
2A	9,361	3,720	13,081
2B	10,343	-	10,343
Of Mutual Benefit	18,227	4,653	22,880
Total:	$53,470	$16,885	$70,355

REPORT ON UNITED STATES ASSISTANCE TO THE AGRICULTURAL SECTOR PAKISTAN

FERTILIZER

IMPORTS, PRODUCTION AND DISTRIBUTION

Fertilizer Imports

In 1952 a predecessor agency to the USAID, the Foreign Operation Administration, entered into an agreement (No. 391-13-002) with the Government of Pakistan to increase the supply of fertilizer in order to improve crop yields and to provide fertilizer for experimentation and demonstrations to farmers. Village AID facilities assisted in the demonstration activities (Project 391-13-010). The agreements were renewed and the activities continued under Project 391-13-021, and were completed in 1957 at a total cost of $10.6 million.

In subsequent years, fertilizer was procured under various development loans as shown in Schedule A. The latest loan agreement for $20 million, signed February 28, 1973, provides for GOP procurement on a reimbursable basis in order to expedite shipments to Pakistan. An award of $16.3 million for a supply of phosphatic fertilizer, funded on a reimbursable basis under this $20 million loan agreement, was approved in February 1973 by AID/W.

Fertilizer Production

The U.S. Government in 1952 entered into an agreement with Pakistan (Project 391-23-007) to assist in the construction of a fertilizer plant at Daudkhel, Punjab Province. The basic raw materials, coal, gypsum and water are available at the project site for producing amonium sulphate. Dollar and rupee funds, totaling $13.5 million were provided for the purchase of construction materials, acquiring technical services, planning, designing; and the procurement and installation of machinery. Construction was completed in 1958. The plant has recently been converted from coal to a gas method of production. An expansion of the facilities has been financed by the GOP through its agency, the Pakistan Industrial Development Corporation (PIDC).

Another fertilizer factory, utilizing natural gas, was constructed for the production of Urea and is located in the Multan District of the Punjab Province. About $10 million was provided for its construction in 1957 through President Eisenhower's Special Middle East Fund. The PIDC procured the technical services, imported machinery, monitored the project through completion and subsequently implemented an expansion program to produce calci-amonium-nitrate.

In 1969 Rupee financial assistance, through Cooley Loans (equivalent to $9.6 million), was provided to the ESSO Fertilizer Company and Dawood Hercules Limited for producing Urea at Dharki in the Sind Province and Chichoki Mallian near Lahore.

In addition to the facilities constructed with U.S. assistance, the GOP established through the PIDC two plants for producing phosphates, one each in Lyallpur and in Jaranwala in the Punjab Province. A privately owned facility, Jaffar Brothers Limited, is under construction within the Karachi area for the production of mono-amonium phosphate.

Fertilizer Survey

In February 1970, USAID contracted for the services of the Chemical Consultants Pakistan Limited (CHEMECON) to survey fertilizer procurement, marketing, storage, transportation and distribution within Pakistan (Contract AID-277). The contractor used 1969 as the representative year for his survey and submitted his report to USAID in August 1970. Although the report was widely distributed, we could not ascertain whether the survey contributed toward constructive changes in the Pakistani system of planning, procurement and distribution of fertilizer. In discussions with USAID agriculture officials it was indicated that no relevant documentation evidencing USAID's or GOP's reaction to the survey is available.

Distribution

The following principal agents distribute fertilizer in Pakistan:

Pakistan National Oils
ESSO Fertilizer Company Limited
Dawood Corporation Limited
Jaffar Brothers Limited

Also, the Agriculture Development Corporation (ADC) and the Rural Supply Cooperative Corporation (RSCC) distribute fertilizer. The private distribution agents have qualified and well trained staffs located throughout the country who provide information to farmers on the use of the right fertilizer for each particular crop or soil. However, the ADC and the RSCC rely on the extension service of the GOP Department of Agriculture to keep the farmer informed. Government subsidies help popularize the use of fertilizer.

The demand for fertilizer, both Nitrogenous and Phosphatic, increased substantially during 1972-73; while the total consumption of fertilizer was about 382,000 nutrient tons in 1971-72, consumption during 1972-73 was estimated to be 520,000 nutrient tons. Despite heavy imports of 317,000 nutrient tons and local production of 289,000 nutrient tons, the ever-increasing demand of the farmers cannot be met sufficiently.

The GOP Ministry of Food and Agriculture estimates that the fertilizer import requirement for 1973-74 will be much more than the actual consumption during 1972-73, which has shown an increase of 38% over the consumption of the preceding period; 18% more than originally projected.

This critical need will become more acute as the farmer increases his consumption of fertilizer. At present he is using on the average less than half the recommended rates of nitrogen applications and less than one-eighth of the recommended rates for phosphates. A January 1, 1973 Pakistan-Economic Development Data Report reflects Pakistan's need to import fertilizer to meet shortfalls at least through 1976 regardless of expansion in fertilizer producing facilities because it takes at least three years to build a plant.

In the long-term concept, when the supply of fertilizer is adequate to meet the demand, financial and knowledge constraints are bound to intensify. The need to make adequate institutional credit facilities available both to the fertilizer dealer and the farmer will become acute. Also, since a large percentage of farmers is unaware of the benefits derived from the use of fertilizer, they will have to be introduced to its significant impact on crop yields when properly applied under optimum conditions. Good planning impels early attention to these eventualities so as to accelerate the pace of agricultural growth.

SCHEDULE A
To ANNEX III

REPORT ON
UNITED STATES ASSISTANCE
TO THE
AGRICULTURAL SECTOR
PAKISTAN

FERTILIZER PROCUREMENT LOANS
FROM FY 1966 TO FY 1973

Loan No.	Date	Purpose	$(Million)
391-H-096	1965	General Imports (Fertilizer Allocation)	5.4
391-H-115	1966	General Imports (Fertilizer Allocation)	10.0
391-H-117	1967	General Imports (Fertilizer Allocation)	2.2
391-H-121	1967	General Imports (Fertilizer Allocation)	10.8
391-H-127	1968	Fertilizer for FY 1968	16.9
391-H-140	1969	General Imports (Fertilizer Allocation)	18.4
391-H-144	1970	Fertilizer for FY 1970	17.4
391-H-148	1970	General Imports (Fertilizer Allocation)	2.1
391-H-152	1972	General Imports (Fertilizer Allocation)	12.8
391-H-154	1973	Fertilizer Imports (Signed Feb.28,1973)	20.0
		Total:	116.0