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Country: Pakistan

Project No. 391-17-110-296

Submission Date:

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Project Title : Agricultural Research

U.S. Obligation Span : FY 1969 through FY 1974

Physical Implementation Span : FY 1970 through FY 1974

Gross life-of-project financial requirements (in thousands)

U.S. dollars \$ 1,172

U.S. owned local currency -

Cooperating country cash contribution -

Other donors -

TOTAL : \$ 1,172

(See project funding table, Annex B)

PAGE 1 OF 15 PAGES

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Noncapital Project Paper (PROP)
Agricultural Research 391-17-110-296

I. SUMMARY DESCRIPTION

The key to sustained agricultural growth in Pakistan lies in improved agricultural research capability and administration. Without well-developed, coordinated research focused on important problems, Pakistan's agricultural production will reach a plateau when the limits of known technology and resources are exploited. Interdisciplinary research efforts are needed to improve existing crops--to develop greater disease and insect resistance, for example-- and to develop new crops and improved livestock husbandry to facilitate diversification in agricultural production.

The country has an agricultural research base on which to build the type of research institutions and programs needed to assure continued agricultural growth. Two elements in the research system need strengthening: (a) the present system of administration and coordination of research does not focus efficiently the limited research talent and facilities on important problems, and (b) the graduate level programs of the two agricultural universities (West Pakistan Agricultural University and East Pakistan Agricultural University), while having shown remarkable development since the universities were established in 1961, suffer from inadequate infusion of ideas and lack of confidence among the researchers (teachers and students alike) in the techniques of carrying out the research on which graduate degrees and the future agricultural scientists are based.

The goal of this project is to develop a foundation, based on sound agricultural research, for sustained growth in agricultural production. More specifically, the goal is to develop the capacity to administer, coordinate and direct research efforts toward relevant problems and to improve the capacity of the two agricultural universities to produce top-level research scientists.

The general approach for US assistance will be to provide qualified advisors and short-term consultants to help improve the two elements in the research system in need of strengthening. One full-time ~~director~~ will be provided to each of the two provincial agricultural research committees to assist them and the central Agricultural Research Council to improve procedures and staff capability in planning, administration and coordination of research.

One resident research advisor will be provided by university contract to West Pakistan Agricultural University and two to East Pakistan Agricultural University to help establish interdisciplinary research efforts focused on significant problem areas, and to advise in research design and techniques. Short-term consultants will be provided to the agricultural research institutes, the agricultural universities, the Agricultural Research Council and the provincial agricultural research committees to assist in specific problem areas. One full-time oilseed research advisor will be provided to help develop a coordinated crop improvement program designed to increase production of oilseed crops.* This advisor will assist the provincial agricultural research committees to develop a coordinated crop improvement program for oilseeds similar to the existing programs for wheat, rice and coarse grains. In each province the services provided under this project will be coordinated in a unified program under the direction of the Agricultural Research Administration Advisor.

2. ENVIRONMENTAL SETTING

Pakistan's agricultural production increases in recent years have, to a large extent, been dependent on imported inputs--fertilizer, high yielding varieties of seeds, insecticides, pumps and know-how. The most dramatic element, sometimes referred to as the catalyst in the "Green Revolution" in Pakistan are the high yielding varieties of seeds which are the result of research performed largely in the international research centers--rice in the Philippines and wheat in Mexico. While it is possible to get by on imported technology such as the improved seeds in the short run, continued growth in agricultural production will be increasingly dependent upon more adaptive research within the country. Pakistan's capability for agricultural research has improved considerably in recent years, but it remains inadequate particularly in two respects: (a) the institutions for administering, coordinating and directing research lack capacity to focus the country's limited research resources on important problems in an efficient manner, and (b) the level of sophistication in research techniques at the two agricultural universities, which are the primary centers for training agricultural research scientists in Pakistan, is below the standard necessary to produce the quality of scientists needed to upgrade agricultural research competence in Pakistan.

Detailed descriptions of the situation are given in the following documents:

1. TOAID A-344, August 28, 1967, Preliminary Project Proposal for Agricultural Research.

* ~~xxxxxx~~Pakistan

* Advisor will work primarily in West Pakistan although he will be available for consultation in East Pakistan.

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- b. Report of the Joint Pakistan American Agricultural Research Review Team, April 6, 1968, especially chapters II, IV and IX.
- c. FY 1970 Program Memorandum, Agriculture Sector Annex, September 1968, pages A25 to A28.

In summary fashion, the problem of inadequate administration, coordination and direction of research is captured in a paragraph taken from a newspaper article written by the Vice Chancellor of West Pakistan Agricultural University in 1967:

"In Pakistan, current research effort in agriculture and allied fields is dispersed over a large number of small, poorly equipped and inadequately staffed research and experimental stations numbering over 150 which follow uncoordinated programmes covering a multiplicity of research projects of little pointed relevance to an immediate increase in the production of essential commodities. It is a leisurely, "laissez faire" approach, the choice of research problems being dependent on the whims and fancies of the individual research worker and determined by the facilities that happen to be available at a given centre rather than being developed in pursuance of clearly conceived national goals."

Both agricultural universities are showing progress in developing physical facilities for research and both have developed post graduate programs leading to M. Sc. and Ph. D. degrees in several disciplines. The element most notably lacking in the graduate level programs is confidence in the design and techniques for research and in the analysis and interpretation of results.

CONCLUSIONS AND STRATEGY

a. Planning and Coordination of Research

The need for strengthening agricultural research was described in the Preliminary Project Proposal for this project contained in TOAID A-344 dated August 28, 1967. The proposal emphasized the fragmentation of agricultural research and stressed the need for improved research administration and coordination. In recognition of the shortcomings of the research system, the Government of Pakistan invited the USAID to furnish four specialists in research administration and coordination to do a joint review of Pakistan's agricultural

research in cooperation with three Pakistani officials with various responsibilities for agricultural research. The team's terms of reference, observations and recommendations are described in "Report of the Joint Pakistan American Agricultural Research Review Team," Islamabad, April 6, 1968.

In sum, the recommendations of the joint review team call for a broad revision in current procedures for administering and coordinating agricultural research. The key to improving research along the lines suggested by the team is acceptance and implementation by the Government of Pakistan of the recommendation for a strengthened Agricultural Research Council (ARC) involving higher status, broader functions, increased funds and expanded technical staff. The team's conviction was that a central coordinating body is absolutely necessary for identifying priority research needs and should have some power or leverage to influence the mobilizing of limited research resources into coordinated and integrated work in the priority areas.

The present ARC is generally recognized as having the major responsibility for coordination of agricultural research throughout the country, but it has failed. It has been concerned largely with reviewing project proposals submitted to it by various research agencies in both provinces, not with identifying areas that need to be researched. To help assure effective performance of a reorganized ARC, the joint team recommended that an expatriate with the proper qualifications be assigned "on a full-time basis in Pakistan to consult with appropriate government officials and research personnel in the organization and functions of the Council. This person should, of course, be a scientist of repute with experience in planning, organization and conduct of inter-disciplinary, regional or national research programs."

Subsequent to the joint team review, Ford Foundation sponsored a team of two consultants to focus "on problems and deficiencies which . . . , if corrected or modified, will allow the country to develop a sound and effective research base." In their draft report, the team stated:

"We concur that the functions of the Pakistan Agricultural Research Council should be redefined to enable it to formulate policy and act as an advisory body assessing and setting priorities on agricultural problems of national magnitude. Many other proposed objectives of a revamped council

are laudable. Our detailed explanations of problems of administration and execution of a widely dispersed and loosely coordinated research program point up the need for a strong Provincial Board (to function as full-time working body) to serve the Secretary of Agriculture. This Board, composed of outstanding administrators and a scientists, should play a major role in determination of agricultural research goals, priorities, coordination, funding and implementation."

The Ford Foundation consultants believed that the provinces should have more responsibility for determining research goals and priorities than was implied in the report of the joint team. Naturally, the provincial government officials favor their retaining more responsibility. At the same time, everyone agrees that it is necessary to have an effective national coordinating body and that a properly reorganized ARC with an expanded and upgraded permanent staff could serve that role very effectively. A modest amount of high-level technical assistance would help assure that the role is filled successfully.

Both provincial governments have recently appointed agricultural research coordinating committees, or boards. Most of the members of these committees also serve on the ARC. This arrangement can be very useful to both the central council and the provincial committees if the provinces establish full-time staffs to assist the committees in the planning, coordination, and implementation of research. Unless full-time staffs are established, the committees will not likely constitute effective bodies because the present committee members are overburdened with day-to-day duties other than those for which these committees were formed. Both provinces indicate that full-time staffs are to be established to serve the research coordinating committees.

Because of the importance the Mission places on effective planning, coordination and direction of research, USAID proposes to furnish the services of a top-level Agricultural Research Administration Advisor to each of the provincial governments to work with the research coordinating committees and their staff. A prerequisite will be that competent, full-time staffs are appointed. Both of these advisors will also work with the central Agricultural Research Council as a second order of priority. Concentrating assistance at the provincial level with some help also for the ARC will relate our efforts more closely to actual research operations, help get equal representation of the provinces' research problems in national deliberations, and also assist the ARC in developing its capacity to perform the functions for which that body is intended.

In addition to advising and assisting in improvement in administration and coordination of agricultural research, the Research Administration Advisors will assist the provincial committees to identify priority problem areas for which it would be useful to bring in specialized agricultural research scientists on a short-term basis to consult on design, technique and analysis of specific research topics and to hold seminars and discussions relevant to the specific problems. In general, these short-term consultants would assist, through the provincial committees, research institutes under jurisdiction of the provincial departments of agriculture, such as Ayub, Tandojam, and Tarnab (and their substations) in West Pakistan and Joydevpur in East Pakistan.

The joint team recommended that short-term consultants from the U. S. Department of Agriculture be employed to assist the ARC in the establishment of improved personnel procedures, including uniform pay scales, selection criteria and promotion based on merit; development of a national documentation center to facilitate the exchange of information among researchers in Pakistan and between Pakistani researchers and the international research community; and the development of systematic procedures for the introduction of plants and maintenance of germ plasm. Improvements in each of these areas would directly contribute to better agricultural research in Pakistan by providing greater incentives to outstanding scientists, enhanced communication and flow of information among researchers, and access to strains of plant breeding stock throughout the world as well as safeguards against the introduction of new plant diseases and pests. These specialized areas should not be developed, however, until the ARC is reorganized and shows promise of being a viable and functional body. Premature attention to specialized problems would likely result in the development of sub-units before the parent structure is adequately organized, staffed and equipped to administer them properly. Consequently, the Mission will not seek these consulting services until after the ARC has been reorganized and functioning for at least six months.

In West Pakistan one field of agricultural research in which technical assistance can have substantial impact is oilseed crops. In 1963 Pakistan produced only 55% of its 360,000 metric ton annual edible oil needs, and West Pakistan accounted for 70% of this total domestic production. Oilseed crops fit well into the crop rotation patterns in West Pakistan and can contribute to food self-sufficiency. Within the context of the provincial research program developed under the guidance of the Agricultural Research Administration Advisor, it is proposed to carry out oilseed crop research in order to develop a program to meet a larger part of Pakistan's vegetable oil production requirements. A direct-hire Agronomy Advisor, Oilseeds, will be assigned to work with the three Agriculture Research Institutes of the Department of Agriculture to increase the yield of existing oilseed crops, conduct research on new crops (particularly soybeans, safflower and sunflower) and improve methods of oil extraction.

b. Research at Agricultural Universities

Modern technological universities are the fountainhead of a country's

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scientific endeavor. The trained scientists and technologists for manning research centers and for industry and their laboratories provide the scientific concepts and information basic to the development of improved technology for increasing productivity. Establishment of the two agricultural universities in 1961, one in each wing of the country, therefore constitutes a landmark in the development of agricultural science in Pakistan. Since 1961 USAID has assisted East Pakistan Agricultural University by providing the services of a Texas A&M University contract team under the East Pakistan Universities project (391-11-660-144). This assistance will terminate June 30, 1970. Additionally, USAID has assisted West Pakistan Agricultural University since 1961 by providing the services of a Washington State University contract team under the West Pakistan Agricultural University project (391-11-660-146). This project will terminate June 30, 1969. At present there are 42 participants from EPAU and 41 from WPAU carrying out research under degree programs in the United States. It is planned that, at contract termination, 29 participants from EPAU and 20 participants from WPAU will be permitted to complete their research programs under the proposed Agricultural Research project and will return to play important roles in this project at their respective universities in East and West Pakistan.

The two universities have developed rapidly into major centers of agricultural education and research. Besides the B.Sc. degree courses, the universities have developed postgraduate programs leading to M.Sc. and Ph.D. degrees in several disciplines. All postgraduate students must undertake research on an approved project and prepare an acceptable thesis as a part of their degree requirements. There is a great need to develop the competence and confidence of the staff members engaged in agricultural research and in supervising the research of graduate students working on advanced degrees, particularly with respect to research methods and the design and analysis of research. The most efficient and practical way to help build this competence and confidence is to bring in highly qualified specialists for short periods of time—two weeks to three months—to consult with the researchers, help them design and structure projects and hold seminars on specific topics. The Vice-Chancellors of the two agricultural universities have indicated that this is the type assistance they need and want at this stage of the universities' development. The Vice-Chancellor at West Pakistan Agricultural University has strongly requested one (but only one) full-time resident advisor to assist in orienting university research efforts toward an interdisciplinary, team approach and to help coordinate and arrange for visits of the short-term consultants. The Mission plans to furnish one full-time resident research advisor at West Pakistan Agricultural University beginning in FY 1970.

The Vice-Chancellor at East Pakistan Agricultural University has indicated that EPAU needs and could ~~use~~ use four full-time resident research advisors beginning July 1, 1970. The Mission believes that it is easier to obtain the services of top-level research scientists on a short-term consulting basis than for a full two-year assignment. Therefore, the Mission proposes to furnish two full-time research advisors at East Pakistan Agricultural University and to sponsor highly-qualified, short-term consultants on specific problems. One of these advisors will place emphasis on the administration of research programs and the second advisor will concentrate on research programs in plant breeding. The advisors and short-term consultants for both EPAU and WPAU will ~~be~~ be furnished under a single university contract or under two separate contracts. This will be determined by Mission review.

c. Relation to other Projects

Two other research programs are closely related to this project, although they are distinctly separate entities:

(1) The Ford Foundation sponsors several full-time research advisors who are specialists in particular crops to assist in the 'Coordinated Crop Improvement' schemes in both East and West Pakistan. Ford has three research advisors in West Pakistan, one each working in wheat, rice and coarse grains (corn, sorghum and millets); and 3 advisors helping to establish a Rice Research Institute at the new site of the East Pakistan Agricultural Research Institute. Ford Foundation also plans to sponsor, over the next 5 years, an estimated 45 participants for applied training abroad in wheat and rice research and 25 participants for M.Sc. or Ph.D. degree programs in various disciplines related to food grain research.

(2) Colorado State University, under WOH contract AID/csd-2167, is expected to send several staff members to West Pakistan as short-term consultants and research advisors in connection with research on water management and water use in agriculture.

Both of these programs complement the project described in this PROP. The Mission works closely with Ford Foundation so as to avoid duplication of efforts. Activities under the Colorado State University contract will be monitored by the Mission.

4. EXPECTED TARGETS, RESULTS AND OUTPUTS

The development of a sound agricultural research base, including adequate research institutions and programs to assure a continuing flow of new but proven technology, should make possible average annual increases in agricultural output of 4 per cent or more for the next 10 to 20 years or longer. Otherwise, a plateau in production will occur when the limits of present resources and technology are approached.

It is expected that by the planned termination date of this project, the end of FY 1974, the institutional structure for planning and coordination of research and for producing well-trained agricultural research scientists will have been well enough developed that the broader goal of a sound agricultural research base will be assured. More specifically, by the planned termination date it is expected that:

(1) The Agricultural Research Council and the provincial agricultural research committees will be playing an active, positive role in identifying problems confronting Pakistan agriculture and in planning (with appropriate research organizations of the provinces, the agricultural universities, and other organizations) cooperative and coordinated research projects for the solution of such problems. (Note: One half or more of the members of the ARC also serve on the provincial agricultural research committees.)

(2) The Agricultural Research Council will have an adequate staff at the Director level (six, compared with the present two) with a Director-General in charge, plus sufficient supporting staff, to furnish capable leadership in research evaluation, planning and coordination in the major fields of agricultural research and development.

(3) A Board of International Agricultural Science Consultants will have been established and will be meeting at least once each year with the Agricultural Research Council for continuing assessment of progress in developing Pakistan's improved research organization and programs and to advise regarding new developments abroad.

(4) The provincial agricultural research committees will have developed at least small supporting staffs to assist in identifying and assessing major agricultural research problem areas and in matching these problems with research resources and capabilities.

(5) The provincial agricultural research committees will have taken appropriate action to correct those procedures for planning and implementation of research, including the arrangements for financial sanctions, and such other factors which limit the effectiveness of research in the provinces.

(6) The two agricultural universities will have made a significant move in the direction of the interdisciplinary approach to research, focused on problem areas deemed by the ARC and the provincial research committees to be of high priority, so that the major objectives of the research effort will be the contribution to be made to increasing efficiency of agricultural production and a secondary objective will be the turning out of graduate theses.

5. COURSE OF ACTION

Officials in various strategic positions in agricultural research in Pakistan have expressed a desire for advice and assistance in improving the efficiency of their research efforts. Their attitude reflects a growing awareness of the problems of administration and coordination and of the critical need for improvement. They are aware that they must, and indeed have already begun to make administrative changes. Provincial agricultural research committees have been appointed. The Central Government has made a decision to implement, with only minor changes, the recommendations of the Joint Agriculture Research Review Team. The Vice Chancellors of the two agricultural universities, the Secretaries of Agriculture and others are enthusiastic about the prospects of getting highly qualified advisors and consultants to help them with varied research problems. In short, the climate is favorable for administrative changes, increased financial support, and other self-help measures.

The Mission believes that, under these conditions, a modest investment of technical assistance can have substantial impact in making vitally-needed improvements in crucial aspects of Pakistan's agricultural research. A carefully-planned project has been developed which will provide technical assistance through direct hire, PASA and university contract advisors and short-term consultants with related participants combined in the following Course of Action:

Planning and Coordination of Research

(a) Provide the direct-hire services of two Agriculture Research Administration Advisors for four years beginning July 1, 1969, to work with the GOBP and GOWP Provincial Agriculture Research Committees and the Agriculture Research Council. In each province the Agriculture Research Administration Advisor will be responsible for project coordination and direction.

These advisors should be persons who are agricultural scientists in their own right but who have also had extensive experience in the administration of coordinated research efforts, such as those between the U. S. Department of Agriculture and the land grant universities. They should have had experience comparable to that of directors of experiment stations.

(b) Provide short-term PASA consultants from the U. S. Department of Agriculture to assist the ARC and the provincial research committees to establish improved personnel procedures, a national documentation center to facilitate exchange of information among research workers in Pakistan and between Pakistani researchers and the international research community, and to develop systematic procedures for the introduction of plants and the maintenance of germ plasm.

(c) Provide one direct-hire Oil Seed Research Advisor for five years to help develop the potential for expanded oilseed production in West Pakistan. Within the context of the provincial research program and under the guidance of the Agricultural Research Administration Advisor, this advisor will assist the provincial agricultural research committees to develop a coordinated crop improvement program for oilseeds similar to the existing programs for wheat, rice and coarse grains.

(d) Provide the opportunity for selected research administrators, scientists and directors of staff of the ARC and provincial agricultural research committees to observe abroad the methods of organization and administration of research.

Research at Agricultural Universities

The agricultural university in each province will inevitably play a major role in any well planned and coordinated provincial research program. USAID contract assistance to EPAU and WPAU, therefore, will be carried out under the Agricultural Research Administration Advisor in East and West Pakistan, respectively. By contract with an American Agricultural University, AID will:

(e) Provide one full-time contract resident research advisor for three years at West Pakistan Agricultural University beginning July 1, 1969, to assist in the structure and design of research and to help establish an inter-disciplinary research effort focused on a problem area of major significance.

(f) Provide two full-time contract resident research advisors for four years at East Pakistan Agricultural University beginning July 1, 1970. These advisors will begin one year later than the one for West Pakistan Agricultural University because the current project in East Pakistan expires one year later. Two advisors are proposed in East compared with one at West Pakistan Agricultural University because agricultural research in East Pakistan, including research at the university, is much less developed than in West Pakistan.

(g) Provide short-term consultants in specialized research areas to assist in the design, analysis and interpretation of results of research at the two agricultural universities and selected agricultural research institutes in East and West Pakistan as coordination among these institutions increases.

(h) Allow 29 selected participants from EPAU and 20 from WPAU who have begun research programs in the United States under the terminating Texas A&M and the Washington State University contracts to complete their work under the proposed Agricultural Research project and return to strengthen the agricultural research programs of their respective universities.

In addition, this project will finance the study in the United States of five selected research staff members now at WPAU and EPAU. This training will emphasize design and techniques for research and the analysis and

interpretation of results.

(i) Provide funds totalling \$40,000 over the life of the project for use in purchasing laboratory equipment, seeds, books and journals to support university contract advisors.

All the above actions are summarized in the form of "personnel inputs" in Table I. In addition, the personnel inputs in agricultural research planned by Ford Foundation and Colorado State University are shown.

ANNEXURE A

TABLE - I
PLANNED PERSONNEL AND TRAINING INPUTS BY VARIOUS DONORS
RELATED TO AGRICULTURAL RESEARCH

<u>Personnel Inputs</u>	<u>Fiscal Years</u>				
	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
 Fiscal Years.....				
1. Full-time Advisors					
<u>USAID Sponsored</u>					
<u>Direct</u>					
Agriculture Research Administration	2	2	2	2	-
Oilseed Research Advisor	1	1	1	1	1
<u>Contract</u>					
West Pakistan Agriculture University	1	1	1	-	-
East Pakistan Agriculture University	-	2	2	2	2
<u>Ford Foundation Sponsored</u>					
<u>Coordinated Crop Improvement</u>					
Wheat, West Pakistan	1	1	1	1	1
Rice, West Pakistan	1	1	1	1	1
Maize, West Pakistan	1	1	1	1	1
Rice, East Pakistan	3	3	3	3	3
2. Short-term Consultants					
 Man Months.....				
<u>USAID Sponsored</u>					
<u>PASA</u>					
Agriculture Research Administration	6	6	6	6	-
<u>Contract</u>					
West Pakistan Agriculture University	4	4	4	4	-
East Pakistan Agriculture University	-	8	8	4	4
Colorado State University (WOF Contract)	12	12	12	12	-

Personnel Inputs

Fiscal Years
1970 1971 1972 1973 1974
 in months.....

3. Participants

Direct

Agriculture Research Administration 50 60 60

Contract

East Pakistan Agriculture University 175 29 10 - -
 East Pakistan Agriculture University 227 20 10 - -

Food Foundation (Food)

Food Foundation (Food) 50 50 50 50 50
 Food Foundation (Food) 50 50 50 50 50

NON-FEDERAL PROJECT FUNDING (OBLIGATIONS IN 0000)

Annex B

PROJ DATE
January 21, 1969

COUNTRY: Pakistan Project Title: Agricultural Research

Original
Project #991-17-110-296

Fiscal Years	ap	L/G	Total	Cont ^{1/}	Personnel Serv.		Participants		Commodities		Other Costs	
					AID	PASA	CONT	Dir	CONT	Dir	CONT	Dir &
							US Ag	US Ag	US Ag		US Ag	
Prior through Act. FY 1968												
Oper. FY 1969	TC	G	151 ^{2/}	133	-		108(1)		71		5	-
Bud. FY 1970	TC	G	277	153	80(3)	14	59(3)	30	89		5	-
Bud. FY 1971	TC	G	282	165	73(3)	14	121(3)	30	34		10	-
Bud. FY 1972	TC	G	222	98	80(3)	14	85(2)	30	3		10	-
Bud. FY 1973	TC	G	181	89	78(3)	14	79(2)	-	-		10	-
all other	-	-	-	-	17(1)	-	-	-	-		-	-
Total			1,174	658	338	36	451	30	197		45	-

^{1/} CONTRACT (CONTRACT) COLUMN

^{2/} FY 1969 funding includes 18 months' contract for contract personal services and 12 months' forward funding for contract participant costs.

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Rawalpindi