

# **WATERSHED MANAGEMENT AND LAND RECLAMATION IN NORTH WEST FRONTIER REGIONS OF PAKISTAN**

## **Water Resources Development for Irrigation in Southern K. Pakhtunkhwa**

**H.D.BANGASH**

2-D Sahibzada Abdul Qayum Road  
University Town, Peshawar  
Office Tel # 092-0915853670  
Residence Tel # 091-5841845  
Mobile # 0333-9142427

## **ABSTRACT**

Southern K . Pakhtunkhwa is rich in land and poor in water resources. Two projects in Bannu and six in Dera Ismail Khan Division involving storage construction, can improve its fortunes. A project utilizing regenerated flow in a modest size canal in Kohat and a pumped Canal in Dera Ismail Khan all put together constitute the bulk of its potential for developments. All these projects can irrigate 874,000 Acres of dry land.

# Map of Khyber Pakhtunkhwa

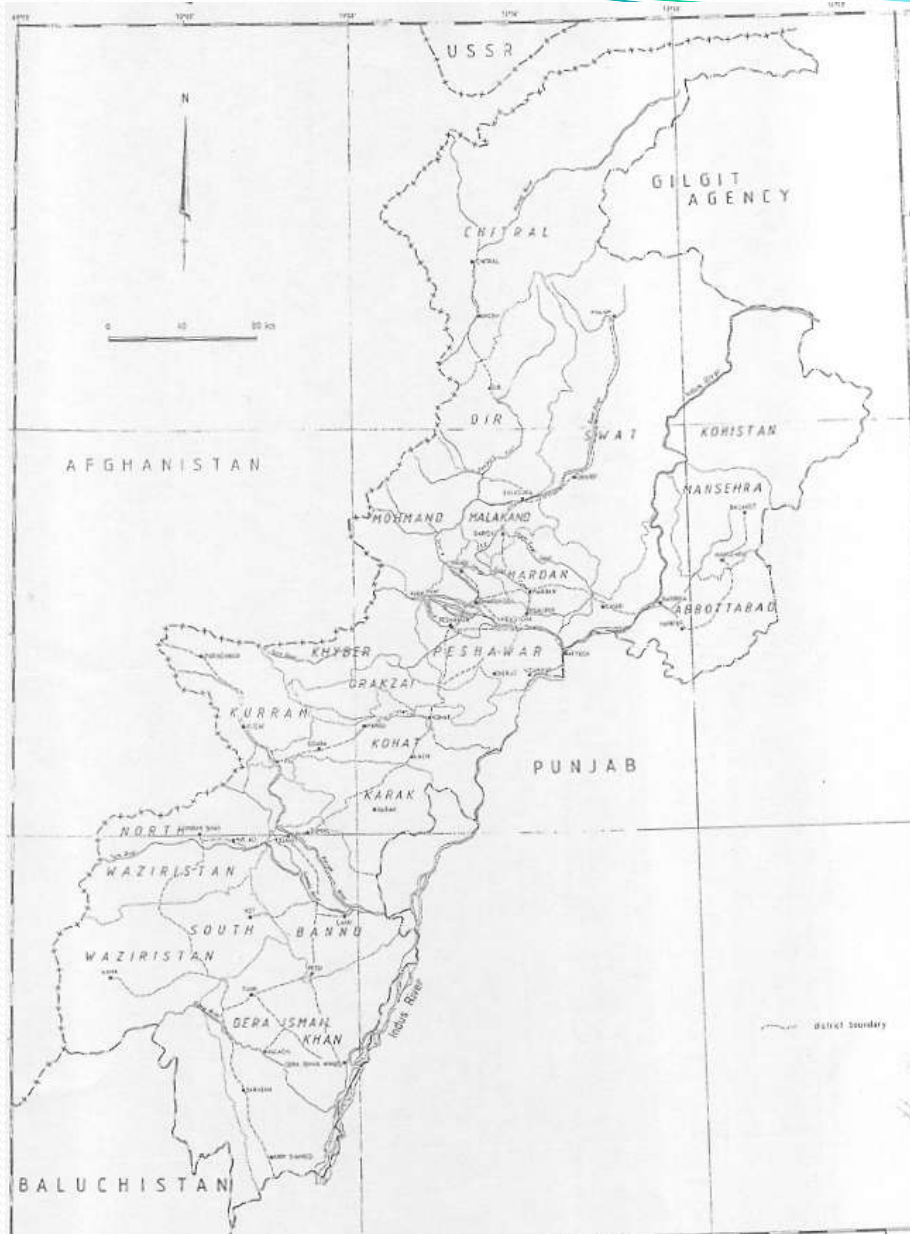
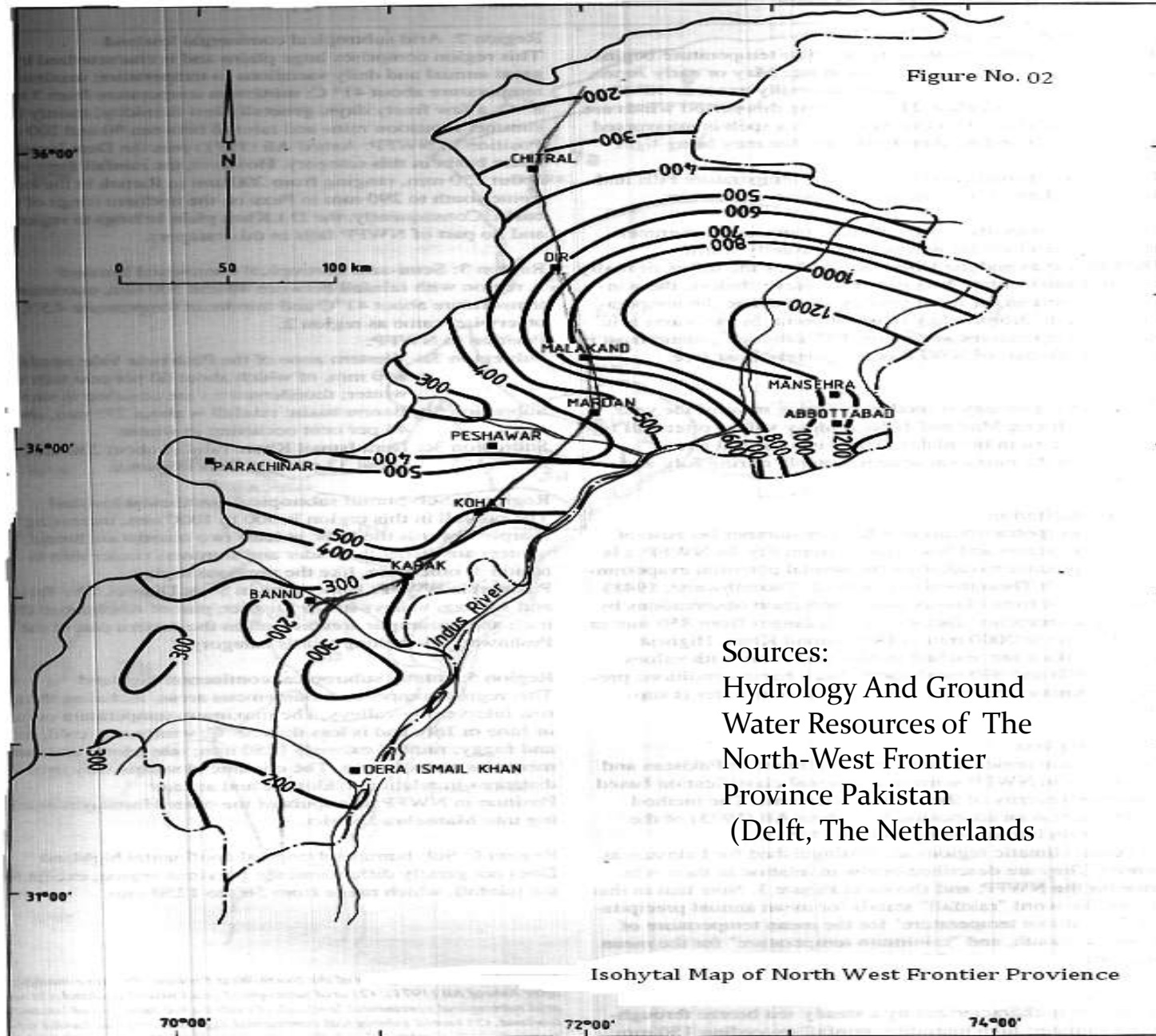


Figure NO 01

# BASIC INFORMATION ABOUT SOUTHERN PAKHTUNKHWA

Area , population & climate			Remarks
1	Area of Southern Pakhtunkhwa including the adjoining tribal territories	37,834 sq Km (14,607 sq miles)	
2	Estimated Population 2010 (updated )(including adjoining tribal territory) 2.1 Kohat Division 2.2 Bannu Division 2.3 Dera Ismial Khan Division	Total= 6,280,507  2,029,547 1,848,975 2,398,332	Net increase in population is round about 2 %.
3	Climate		July August Sept- summer monsoons 60% of total March April Spring Westerlies 25% of total
	Rainfall	Kohat	475 mm
		Bannu	280 mm
		Dera Ismail Khan	218 mm
Temperature	Summer high's +42°C Winter lows ±5°C.		Climate is tropical and typically arid to semi arid.

# ISOHYTAL MAP OF KHYBER PAKHTUNKHWA



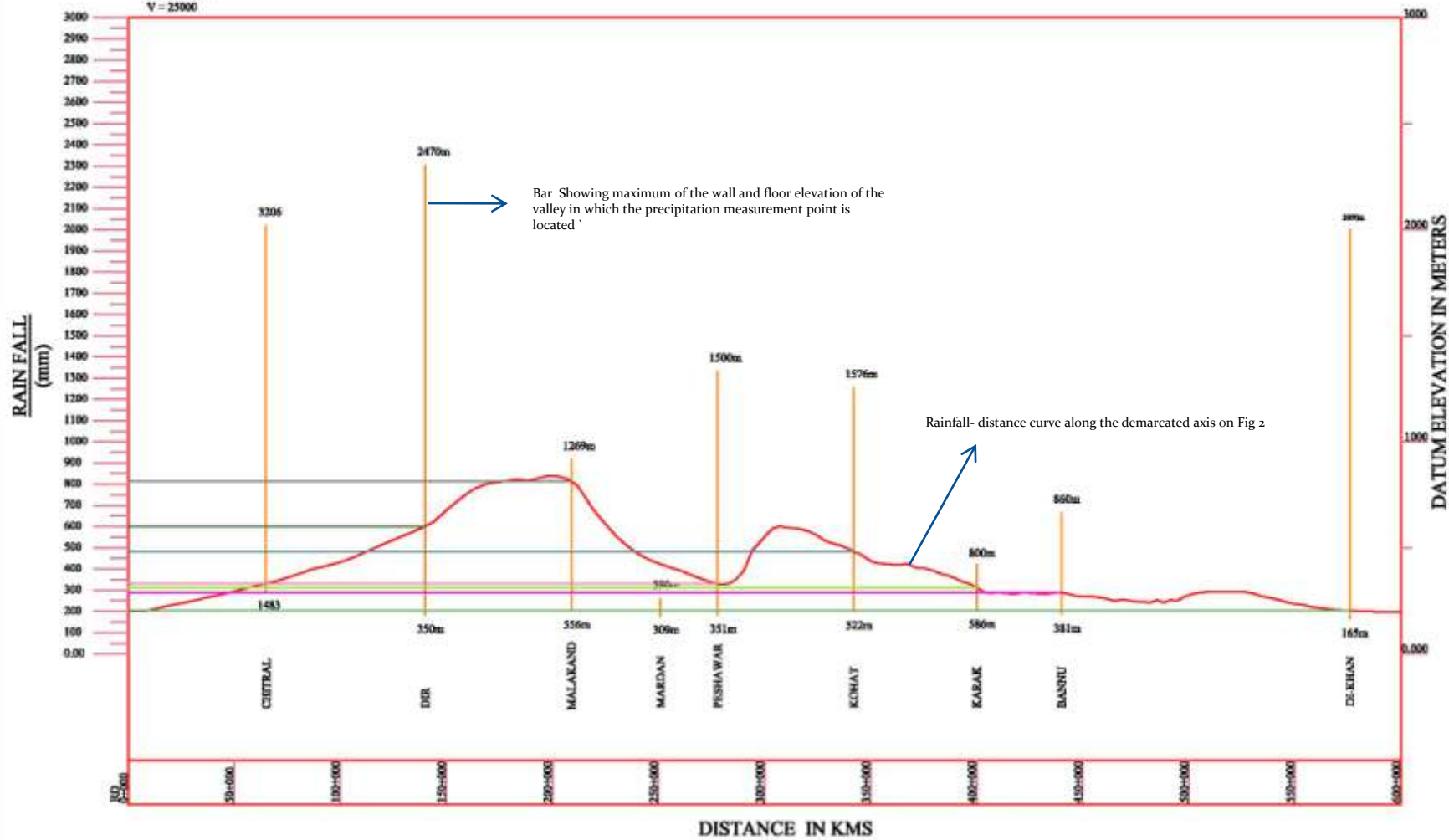
# ISOHYTEL PROFILE

FIGURE NO. 03

**NOTES:-**

1. ALL DISTANCES ARE IN KILOMETERS UNLESS OTHERWISE SPECIFIED.

VERTICAL = 100 TIME EXAGGERATED  
 H = 2500000  
 V = 25000



Bar Showing maximum of the wall and floor elevation of the valley in which the precipitation measurement point is located

Rainfall- distance curve along the demarcated axis on Fig 2

DISTANCE IN KMS

ISOHYTEL PROFILE



# SURFACE WATER POTENTIAL

Name of Divisions	Name of Stream	Approximate total average annual runoff in acre feet. (1 acre foot = 1234 cubic meters.)	Remarks
Kohat	1. Kohat Toi at JARMA weir	100,000 acre feet (approximate)	Most of it is stored in Tanda Dam .
Kohat	1. Teri Toi	Could be around 40,000	Stream is dry except near its junction with Indus .
Bannu	1. Kurram River at Kurram Gharri	1.0 million	This is the anticipated quantity for the regulatory storage at Kurram TANGI Dam.
Bannu	1. Tochi River at Tangi Post	184,000	
Dera Ismail Khan	1. Pezu and Shuza nullahs	Dry streams, wet only during floods	These debouch into the northern fringe of D.I. Khan plains and contribute considerably to land erosion and ravine formations.
Dera Ismail Khan	1. Tank Zam at Hinnis TANGI near JANDOLA.	270,000	It emerges into the plain North of Tank proper and forms a wide deposit of a mile or so of gravels, boulders, sand and fines.
Dera Ismail Khan	1. Gomal Zam	450,000	WAPDA estimate of 780,000 acre ft. is questionable.
Dera Ismail Khan	1. Sheikh Haider Zam at Zarkani	76,000	
Dera Ismail Khan	1. Daraban Zam at Zam tower	57,100	
Dera Ismail Khan	1. Chowdhwan Zam at Domanda	65,000 (Judgment)	

# DEVELOPMENT PROSPECTS IN KOHAT DIVISION

Name of Project	Location	Purpose & concept of the work	Remarks
<p>1. Constructing permanent Diversion structure for Shadi Khel area</p>	<p>Division point of existing Shadi Khel Canal</p>	<p>1. Remodel the existing Shadi Khel Canal to carry more water</p> <p>2. Irrigate additional land available on the right side of the existing Canal and downstream of its tail.</p>	<p>1. Construction of TANDA Dam and lining of irrigation channels from Kohat springs utilizes a major part of the water resource of Kohat district.</p> <p>2. Numerous small Dams constructed should be evaluate for the service and benefits yielded.</p> <p>3. Major efforts needed to supply domestic water supply to town and villages in Karak district and western part of HANGU district.</p>



# DRAINAGE AND DEVELOPMENT OF KOHAT DIVISION



# SCOPE OF DEVELOPMENT IN KOHAT DIVISION

## EXISTING PROJECTS

44,000 ACRES  
IRRIGATED

TANDA DAM  
32,000 ACRES

SHADIKHEL  
4000 ACRES

SPRINGS &  
TUBEWELLS  
8,000 ACRES

STORAGE  
DAMS  
Expected to  
irrigate, 16,662  
Acres (? ).

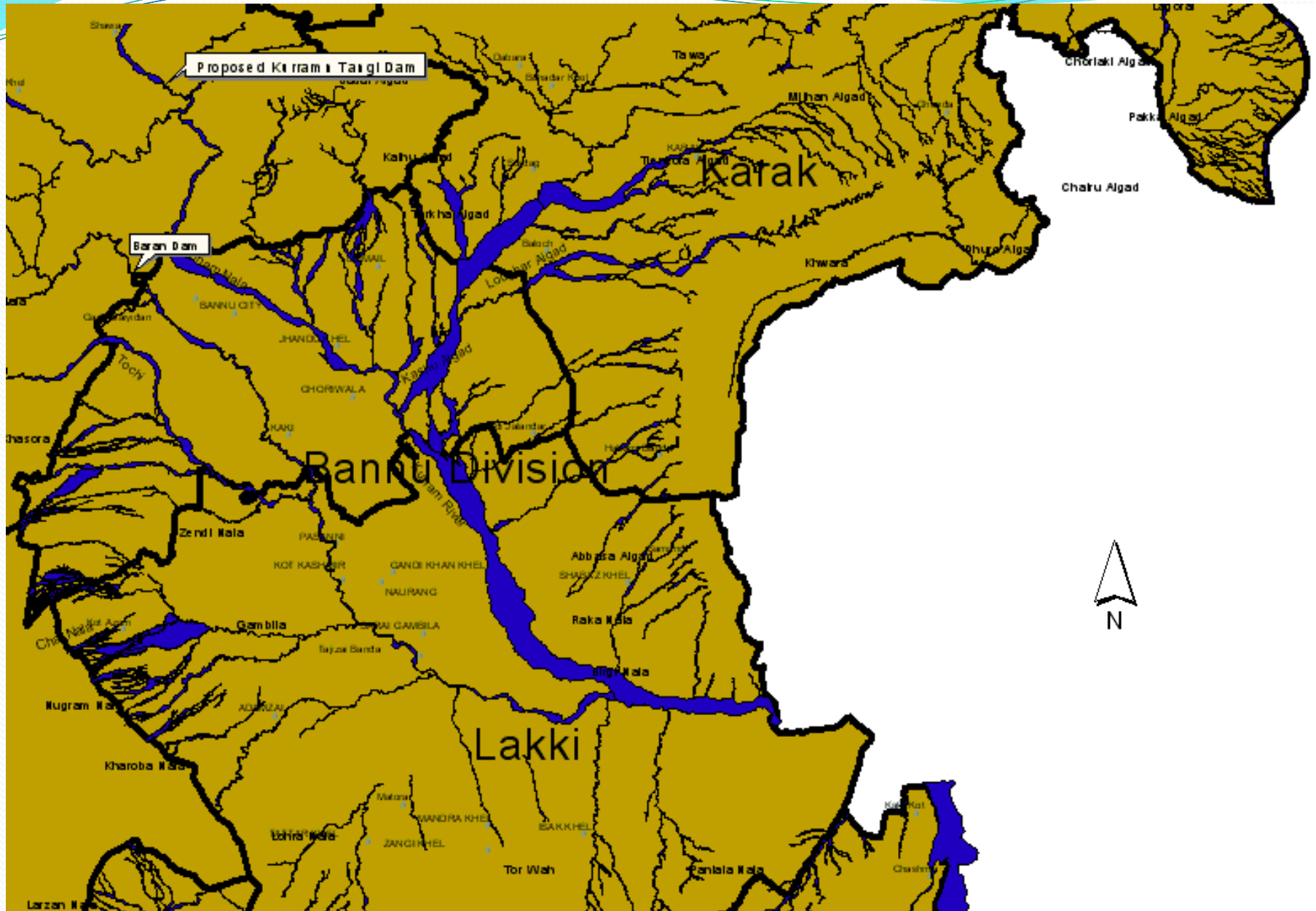
## PROPOSED PROJECTS

REMODELED  
SHADIKHEL,  
4000 ACRES  
more area is  
possible

# DEVELOPMENT PROSPECTS IN BANNU DIVISION

Name of the project	location	Purpose and concept of the work	Remarks
1. Raising of Baran Dam	Baran Nullah	(i) Raise the silted dam height by 6.4 m to create a usable storage of 107000 acre ft taking water from Tochi river through a 5.63 Km feeder channel supplied by diversion Headworks across Tochi river.	It shall rejuvenate a part (28,500 acres) of the now dead Marwat Canal.
1. Kurram TANGI Reservoir Scheme	A 98.17 m (322 ft) high dam would create a storage reservoir of 1.2MAF Five power station downstream of the Dam.	(i) The work is meant to control floods of Kurram River which presently escape to Indus. The regulates flow from the reservoir besides maintaining the irrigation supplies to presently irrigated lands would irrigate 2,70180 ARES additional lands in Bannu and Laki districts.  (ii) It would annually produce 83.4 MW of power and 350 GWH of hydel energy.  (iii) It would provide full control over the floods which now occasionally cause damages.	

# DRAINAGE AND DEVELOPMENT OF BANNU DIVISION



# SCOPE OF DEVELOPMENT IN BANNU DIVISION

## EXISTING PROJECTS

## PROPOSED PROJECTS

IRRIGATED LAND  
10,8690 ACRES.

IRRIGATED LAND  
3,59880 ACRES

BANNU CANAL SYSTEM  
10,7500 ACRES

SMALL DAMS  
1,190 ACRES

KURRAM  
TANGI DAM  
2,70180 ACRES

RAISING BARAN DAM  
28,500 ACRES of  
MARWAT CANAL.

1. New Lands  
68,000 Acres on  
left side of Kurram

2. Supplementing  
Civil Canals  
107,000 ACRES

3. Irrigating  
16,380 ACRES in  
tribal territory

5. Marwat Canal area 140,000  
ACRES is proposed to be supplied  
by Kurram Tangi Dam

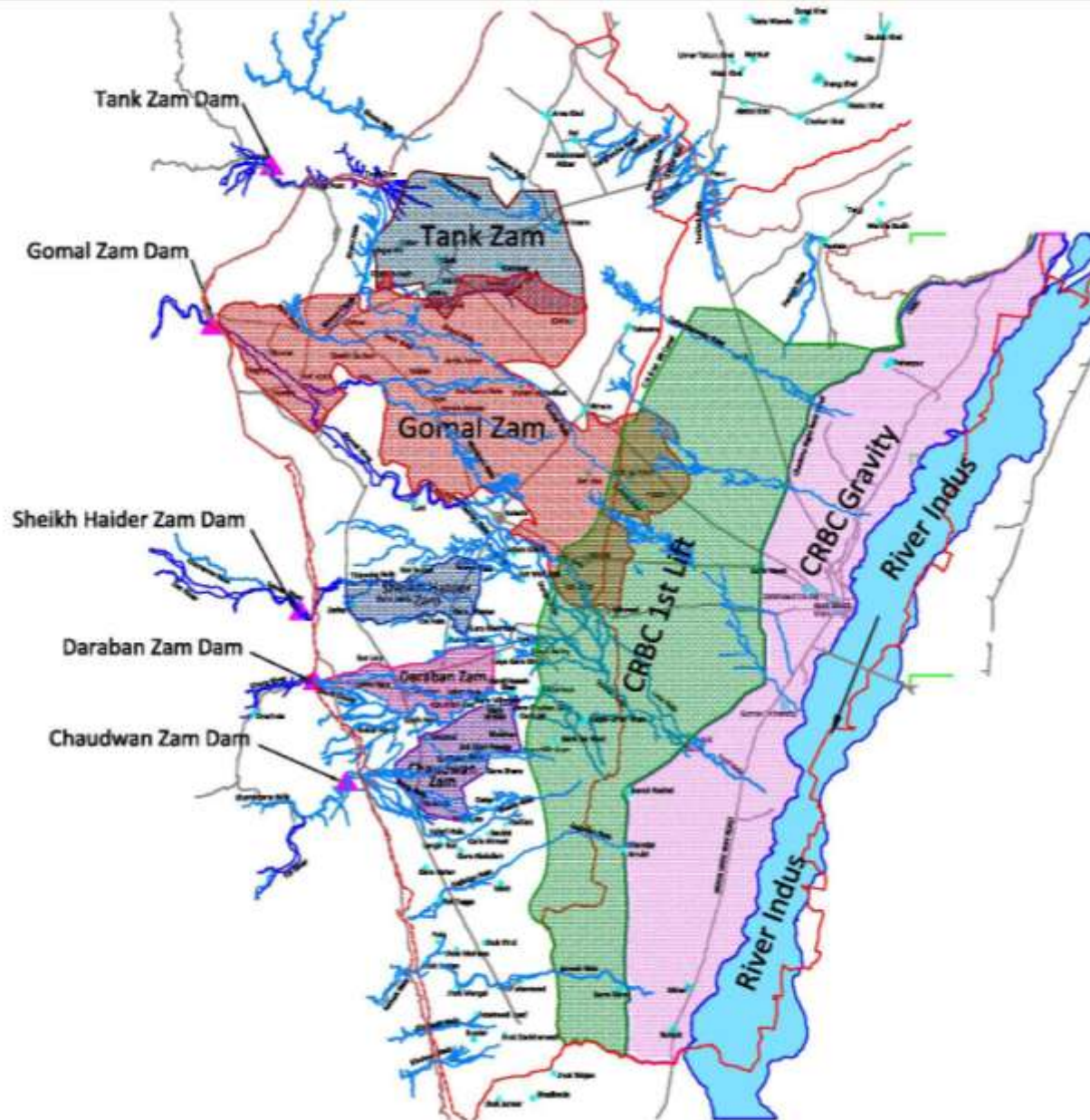
4. Generating 83.4 MW ,  
350 GWH of Power &  
Energy

# DEVELOPMENT PROSPECTS IN DERA ISMAIL KHAN DIVISION

Name of the project	Location	Purpose and concept of the Project	Remarks
1. Gomal Zam Dam	(i) Dam at khaguri kach in south Waziristan along with a power plant. (ii) Irrigation Barrage Kot Murtaza District Tank. (iii) Irrigation area Tank and D.I.Khan Districts.	(i) Store the entire flow of Gomal River. (ii) Route reservoir flow through a power plant to generate 17.4 MW of power. (iii) Divert into it a canal network to irrigate 191,139 acres.	Irrigation acreage appears optimistic. The project is about 75% complete.
2. Tank Zam	(iv) Hinnis Tangi in Frontier Region of District Tank.	Flood control and irrigation in Tank District.	In feasibility stage. Needs to be implemented.
3. Shaikh Haider Zam	At ZARKANI in District TANK	Flood control and irrigation in D.I.Khan District.	In feasibility stage. Needs to be implemented.
4. Daraban Zam	At Zam Tower F R D.I.Khan	Flood control and irrigation in D.I.Khan District.	In feasibility stage. Needs to be implemented.
5. Chowdhwani Zam	At Domanda FR.D.I.Khan	Flood control and irrigation in D.I.Khan District.	In feasibility stage. Needs to be implemented



# DRAINAGE AND DEVELOPMENT OF D.I. KHAN DIVISION



# SCOPE OF DEVELOPMENT IN DERA ISMAIL KHAN

## PROPOSED PROJECTS

## EXISTING PROJECTS

POSSIBLE TO IRRIGATE  
571,350 ACRES

UNDER CHASHMA RIGHT  
BANK CANAL 366,000 ACRES

76,000 Acres Land is irrigated  
from the perinnial flow of the  
proposed ZAM projects

TANK ZAM  
DAM  
70,000  
ACRES

DARABAN  
ZAM DAM  
15,345  
ACRES

SHEIKH  
HAIDER ZAM  
DAM 19,389  
ACRES

CHUDWAN  
ZAM DAM  
17,376  
ACRES

GOMAL ZAM  
DAM ACRES  
163,100  
ACRES

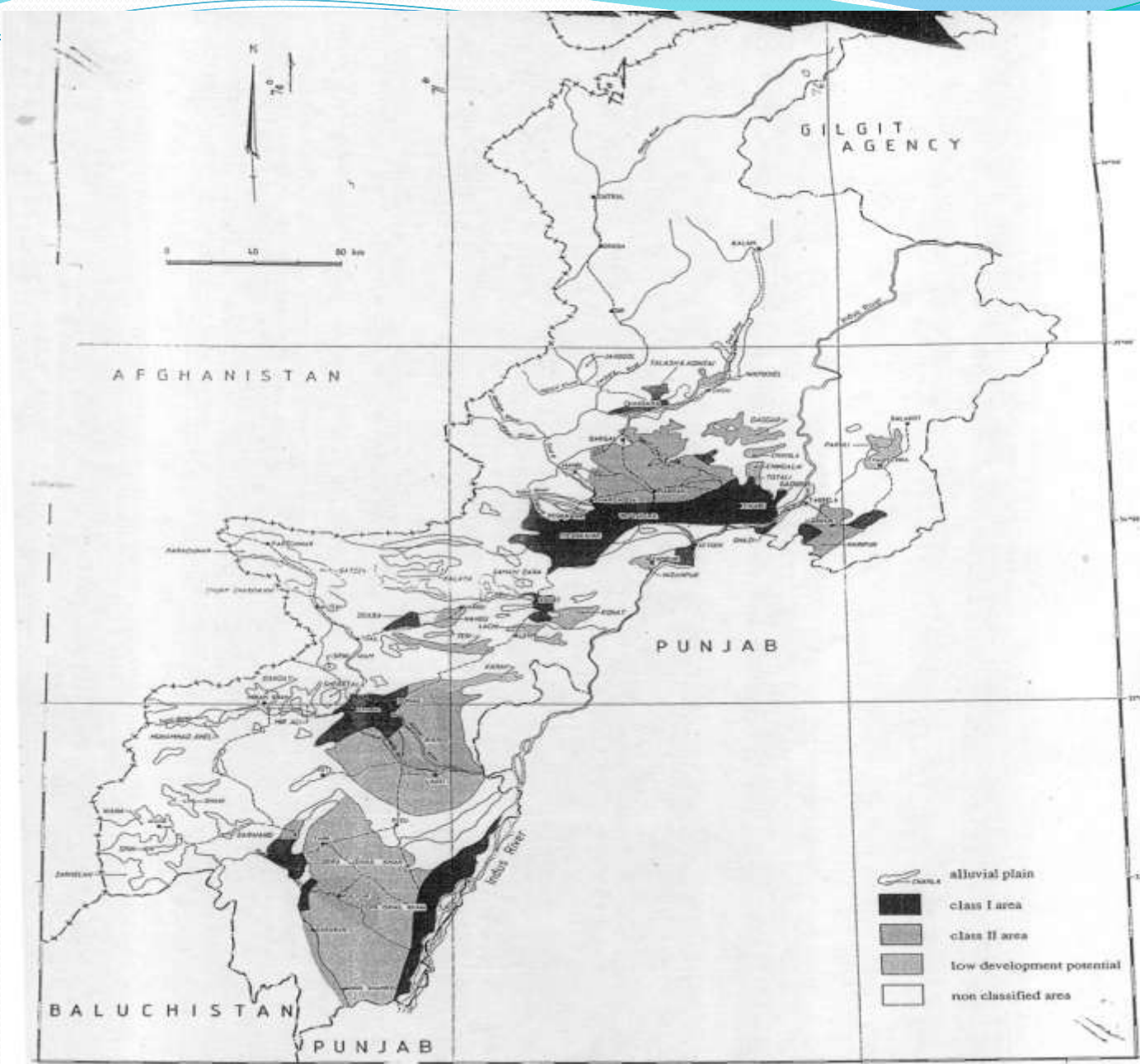
CRBC Lift  
Canal ★  
286,140  
acres



Incase KALABAGH DAM is built and a RIGHT BANK CANAL from it is also included in the project ,the lift will get eliminated and 5,50000 will be irrigated by gravity.

# DEVELOPMENT OF GROUND WATER POTENTIAL IN SOUTHERN PAKHTUNKHWA

	Name of Project	location	Purpose and concept	Remarks
1.	Kohat Division	Isolated private Tube Wells. spread over Kohat, HANGU and Karat district.	Mainly to supplement limited surface water resources, supply drinking water.	Resource very limited judicious use to preserve it for drinking purpose.
2.	Bannu Division	NAURANG Area of district Bannu	To supplement surface water supplies in the well irrigated part and spare some for the less fortunate Laki Tensile.	Nearly 110 tube wells installed. Worked for few years. Locals did not cooperate to implement the basic aim. Wells fell in decay. Few tube wells are working for domestic water supply.
3.	D.I.Khan Division	About a 100 wells installed by government and more by private parties.	To irrigate lands where ground water was sweet.	Good part of the area served by these tube wells has now come under the command of Chashma Right Bank Canal and cheaper water in now available.





# PROBLEMS IN DEVELOPMENT OF SOUTHERN K.PKHTUNKHWA

- The highly unfavorable ratio of water availability to land availability for which there is no solution.
- The social political & administrative problems of governance in the tribal territories, where sites for major dam happen to lie and development activities difficult to pursue.
- The primitive, myopic vision of tribal culture and suspicion of strangers present in the tribal territories, makes it difficult to engineer & execute development projects.
- The socio-political pressures on professionals to tailor the project which are incompatible with natural resources ,resulting in failure of the project to meet the expectations.