

Water Resources of Pakistan:

CANALS	RIVER	DISTRICTS SERVED
	Ravi Sidhuai Barrage	Multan
Bari Doab (LBE)	Ravi Balloki Headworks	Vehari, Kasur, Sahiwal, Multan, Faisalabad.
Chenab (LOC)	Chenab Khanki Headworks	Gujranwala, Hafizabad, Sheikhpura, Faisalabad, Jhang, Sahiwal
Chenab (UOC)	Chenab Marala Headworks	Sialkot, Sheikhpura, Gujranwala
	Chenab Panjnad Headworks	Rahim Yar Khan, Bahawalpur, D.G. Khan Sukkur
	Chenab Panjnad Headworks	Bahawalpur, Rahim Yar Khan
	Chenab Trimu Barrage	Jhang, Muza Targarh, Multan and Faisalabad

5-24
9-37
11-61

Under Basin Treaty 1960.

Indus, Jhelum, Chenab Indus: Ravi, Beas, Sutlej.

major reservoirs: (1) Chashma, (2) Mangla (3) Tarbela.

Barrages: Ferozepur, Sulaimanki, Islam, Balloki, Marala, Trimu,
Panjnad, Kalabagh, Sukkur, Kotri, Taunsa, Guddu, Chashma,
Sindhani, Rasul, Qadirabad, Marala.

Link Canals:

Irrigation Canals:

7,000 water courses (outlets)

total length of canal and distributaries 63000 Km

CANALS SYSTEM OF PAKISTAN

INTRODUCTION:

The climate of Pakistan is hot and dry in summer and the winter remains cold and arid. The average annual rainfall of the country is less than 20 inches although some hilly and piedmont areas have sufficient amount of rainfall but most of the areas of our country have average rainfall between 5" to 10" annually. Such amount of rainfall is insufficient for agricultural activities this rain falls mostly during some particular months. Thus in such circumstances adoption of some artificial methods of irrigation is essential to ensure progressive agricultural activities. Although a number of artificial means of irrigation in various areas of our country are being used since ancient times, yet at present canal and Is modern-mean of artificial irrigation in practice in our country.

CANALS

Irrigation from rivers is an ancient practice. It was being carried out before the Britishers introduced the birth of Christ in various areas of our country but the modern system of large perennial canals. The first modern canal in Punjab was opened in 1859 it was taken out from River Ravi at Madhupur (Gurdaspur District, India). After that a number of canals have been taken out from various rivers and our country has got one of the most excellent systems of irrigation in the world.

CANALS SYSTEM OF PAKISTAN

According to the Indus Basin Treaty of 1960 the right of three eastern rivers (Sutlej, Bias, Ravi) being awarded to India so the canals of Sutlej and Ravi are being fed by the link canals taken out from Mangla and Tarbela projects.

INDUS BASIN TREATY

Before the existence of Pakistan most of the canals of Sutlej and Ravi were used to come from East Punjab Belonging to India. But as a result of partition the head works of these remained in the share of India and the drained areas become part of Pakistan. So these eastern canals which flow from the Sutlej or Upper Ravi suffered from a shortage of water and the prosperity of a large areas was threatened the dispute was eventually resolved through the mediation of the world bank and other countries.

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between India and Pakistan was signed on 19th September 1960. The treaty is known as Indus Waters Treaty or "Indus Basin Treaty".

→ TERMS OF TREATY

According to this treaty the flow of the three western rivers of the Indus basin the Indus the Jhelum and the Chenab (except a small quantity used in Kashmir) will be used exclusively for Pakistan while the entire flow of the three eastern rivers the Ravi the Beas and the Sutlej will be used by India.

Pakistan will arrange the supply of water from its own rivers through link canals for the canals of Ravi and Sutlej.

According to this plan 2 storage dams 5 barrages and one gated siphon 8 link canals remodeling of existing link canals and some other irrigation works have been built.

The estimated cost of three dams barrages and link canals was about one billion dollars and has provided by the world Bank and U.S.A. Canada, Australia Germany and New Zealand.

For all these alternative arrangement, India has to pay 17 crore dollars.

→ CANALS OF RIVER SUTLEJ

Nine canals had been taken out from head works on River Sutlej these are used to drain various areas of Pakistan. At present alternative arrangement have been made in these areas.

Name of Canals	Head Works	Drained areas
Depalpur Canal	Gandá Singh Wala	Depalpur Tehsil Dist. Okara.
Fordwah Canal	Sulemanki.	Areas of Bahawalpur, Schiwal and Multan.
East Sadiqia canal	Sulemanki.	Areas of Bahawalpur, Schiwal and Multan.

4.	Paipattan Canal	Sulemanki	Areas of Bahawalpur, Sehiwal and Multan.
5.	Bahawal Canal	Islam	Areas of Bahawalpur and Mailsi Distt. Vehari.
6.	Qayum Canal	Islam	Areas of Bahawalpur and Mailsi Distt. Vehari.
7.	Mailsi Canal	Islam	Areas of Bahawalpur and Mailsi Distt. Vehari.
8.	Abbasi Canal	Pujnad	Areas of Bahawalnager and Rahim Yar Khan. Distt.

→ CANALS OF RIVER RAVI.

S.No	Name of Canals	Head Works	Drained areas
1.	Upper Bari Doab	Madhupur Gurdaspur District India.	Distt. Of Amritsar and Lahore.
2.	Lower Bari Doab	Baloki	Distt. Of Sahiwal and Multan.
3.	Sidhnai Canals	Sidhnai	Distt. Multan and Vehari

The upper Bari Canal used to come from Madhupur District Gurdaspur (India) after the stoppage of supply of water from India we had to make 87 miles long link canal Bamban wala-Ravi-Bedian-link (BRB) from Chenab. This link canal supplies water of areas of Lahore District.

→ CANALS OF RIVER CHENAB.

S.No	Name of Canals	Head Works	Drained areas
1.	Upper Chenab Canal	Marala	4 lakhs acres of Faisalkot, Gujranwala and Sheikhupura.

Lower Chenab Canal	Khanki	25 lakhs acre of Gujranwala. Sheikhupurra. Distt.
Rangpur and Main Canal	Flavali Bahadur	5 lakhs acre of Muzaffargrah Jhang and Multan Distt.

CANAIS OF RIVER JHELUM.

Name of Canals	Head Works	Drained areas
Upper Jhelum canal	Mangla	173000/- aerea of jhelum and Gurjat Distt.
Lower Jhelum Canal	Rasool	18 Lakhs acres of Sargdha and Gurat Distt.

CANAIS OF RIVER INDUS

Name of Barrage	Canal	Drained areas
Jinnah Barrage near Kalabagh (Punjab)	2	Lakhs acres of Mianwali Muzaffer-grah and Sargodha Distt.
Taunsa Barrage (D.G.Khan Punjab)	2.	14 Lakhs acres of Muzaffargrah & Dera Ghazi Khan Distt.
Guddu Barrage 1. Ghatki Feeder 2. Begari Feeder 3. Desert Pat Feeder	3.	25 Lakhs acres of Sukkur Mirpur and Rhozi Distt.
Sukkar Barrage (Sind) 1. Rohri Feeder 2. East Khairpur 3. West Khairpur Canals. 4. West Khairpur (Rice) 5. N.W. 6 Dadu Canals.	7.	6 Lakhs acres of Sukkur Larkana and Khairpur Distt.

- Gulani, Mehmood
Barrage, Kotri Jamshoror
1. Kotri, J.
 2. P. J. C.
 3. Peayal, C.
 4. Akramyab, C.

28,000 acres of Hyderabad
Muzir, Shanghai, 7, Nawab
Shah Dist.

③ → ~~Example~~ **Example of LINK CANALS**

1- **THE RASUL QADIRABAD LINK CANAL:**

A 30 mile long canal has been built linking Rasul with Qadirabad and about 12,000/- Causes water has been brought from Indus to Rasul.

2- **QADIRABAD BALLOKI LINK CANAL:**

Qadirabad - Balloki link canal is supplying 8,600 Causes water from Indus, Jhelum and Chenab to Ravi at Balloki. It is about 24 miles long.

3- **THE BALLOKI SOLEMANKI LINK CANAL:**

This link canal is providing 6500 Causes water of Ravi to the Sutlej Canals, i.e. Padpatan and Depalpur canals.

4- **THE CHASHMA JHELUM LINK CANAL:**

The Chashma Jhelum link canal is 63 miles long and it is supplying 21,700 Causes water of Indus from Chashma to Jhelum so that the supply of water at Trimm head works can be maintained.

5- **TRIMMI SIDHNAI LINK CANAL:**

Trimm Sidnai link canal is providing 11,000/- Causes combined of Indus, Jhelum and Chenab at Sidnai to Ravi.

6- **THE SIDHNAI BAHAWAL LINK CANAL:**

It is a sixty miles long canal which is carrying the Indus, Jhelum and Chenab waters to the Bahawal Headworks Canals from the Sutlej.

7- **THE TAUNSA PUNJAB LINK CANAL:**

The Taunsa Punjab link Canal is 38 miles long. It is carrying the Indus water for use of the Punjab headworks the link canals have a total length of 388 miles with a total capacity of about 100,000/- Causes but the present supply of water from the canal is insufficient for crop requirements and a large amount of water is obtained from tubewells and other means.

Source: Agricultural Engineering, B.Sc. (Hons.)

The link canals have total length of about 600 km with a total capacity of about 100,000 cusecs. These canals transport water from the three western rivers to the three eastern rivers which run short of water as their water has been allotted to Indus.

Issues of Agriculture:

Climate erosion.

Soil structure

Effect of organic Matter after logging.

Soil temperature salinization.

Nutrient Disorders.

Agro chemical contamination

Pesticides pollution.

Effect of Agro-chemical on quality of crop.

Tolerance limit of common pesticides.

Volatilization

Bio-degradation.

Photo-degradation.

Content of green matter and N content in legumes.

Nutrient status in some weeds.

Agro-Forestry

Waste land Management.

Water sowing.

Annual Canal closure.

False Agri-data collection

Improper storage facility.

High Rates of Inputs.

Marketing system for crops.

Export of wheat.

Planning and policy management.

Sustainable Agriculture:

- Organic Resource Management

- Agroforestry

- Waste land Management

- Acidic Soil

- Saline soils.

- alkaline soils.

- Management of mine-spoils.

- Reclamation and management of eroded soil.

- Integrated Farming System towards sustainable Agriculture

- Waste water management for sustainable Agriculture.

- Bio-fertilizer towards sustainable Agriculture.

① Azolla ② Nitrogen fixer

Blue green Algae, ③ P-solubilizing

bacteria. ④ Plant growth promoter

Rhizobacteria. ⑤ Sulphur

solubilizing Microbes.

- Crop diversification towards sustainable Agriculture

- Nutrient management.

- Water " "

- Allelopathy " "

- Weed " "

- Tillage " "

- Induction of G.M (Genetically Modified crop)

and

- Transgenic plants.