

Paper No. 503

Development of Cholistan

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BRIEF HISTORICAL BACKGROUND

Area falling between Indian Border on the southern side and river boundaries of river Sutlej from Sulemanki to Panjnad and River Chenab from Panjnad to Guddu on the northern side constitutes Bahawalpur Division (Ex-Bahawalpur State). This entire area (about 20,000 Sq miles), adjacent to great Indian Desert, was at one time a desert itself except small patches & pockets along the rivers which were irrigated by Inundation Canals.

| | | | |
|--|---|------|----------------------|
| Total area of bahawalpur division. | = | 11.2 | million acres approx |
| Culturable commanded area being Irrigated by Canals. | = | 3.8 | " |
| Uncultivable area within Canal Boundaries | = | 0.9 | " |
| Desert area (Cholistan). | = | 6.5 | " |
| Cultivable area in Cholistan. | = | 3.5 | " |
| High sand dunes in Cholistan. | = | 3.0 | " |

The high level area can be provided lift Irrigation in later stages if water is made available.

SUTLEJ VALLEY PROJECT.

Sutlej Valley Project comprising three barrages viz Sulemanki, Islam and Panjnad, came into operation during 1920 - 1933. This project changed the fortune & complexion of this area. Canals were excavated which brought extensive areas under Irrigation. At present these canals Irrigate about 3.8 million acres area shown green on the map.

Details of areas irrigated by different Canals are as below:-

| S.No.Headworks. | CANALS. | Gross area (million acres) | Culturable area. (million acres) |
|-----------------|--|-------------------------------|--|
| 1. Sulemanki | (1) Eastern Sadiqia Canal (Perennial). | 1.23 | 1.04 |
| | (2) Fordwah Canal (non-perennial) | 0.46 | 0.43 |
| 2. Islam. | (3) Bahawal Canal | | |

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| | | | |
|-------------|---|------|------|
| | (perennial and non-perennial) Now being fed from Sidhnai Mailsi Bahawal Link. | 0.89 | 0.73 |
| | (4) Qaim Canal (non-perennial). | 0.05 | 0.04 |
| 3. Panjnad. | (5) Panjnad Canal (Perennial + non-perennial). | 1.51 | 1.35 |
| | (6) Abbasia Canal (Perennial + non-perennial). | 0.30 | 0.24 |
| | Total. | 4.44 | 3.83 |

CHOLISTAN.

The remaining area is still a desert and is popularly known as Cholistan. The entire tract consists of sand dunes interspersed with open flat spaces called Dahars. Underground water is very deep and brackish. Nature, however, had been bountiful in respect of fertility of the soil. Clay of flat lands mixed with sand forms an excellent land for cultivation. With rains (about 5" annually) green grasses and nutritive shrubs & bushes grow in abundance which provide feed for the cattle in the area. At present the life in the area is nomadic. Population is sparse and people mostly live on sheep & cattle breeding.

POST INDEPENDENCE DEVELOPMENT

Cholistan is spread over an area of about 6.5 million acres and presents a great developmental potential in fields of Irrigation/agriculture, forestry and livestock. Irrigation Department is engaged in developing the Irrigation sector but the progress is very slow. In fact it is time that the development is taken up in a big way. This area when developed will definitely have a big positive impact on the national economy.

Following are the Irrigation Projects which are being tackled by the Irrigation Department:-

ABANDONED AREAS.

Vast agricultural lands provided with canal supplies were abandoned in 1932 on the report of Darley Committee on the grounds that the soil is of poor quality and colonization was very slow. In fact this was a sort of a conspiracy to allocate some waters of the Sutlej to Bikaner State. However, all these areas are now being reopened in a phased programme.

(i) Abandoned Areas on Abbasia Canal. (shown in blue)

This scheme was completed in 1979 and canal Irrigation has been extended to 117000 acres by excavating new channels & remodelling of existing Abbasia Canal.

(ii) Abandoned area on Bahawal Canal.

Bahawal Canal System including Desert Branch & Dera Nawab Branch are undergoing a phased programme of remodelling since 1970 to extend canal supplies to abandoned areas. Areas shown in yellow (Fig.1.) (97000 acres) have been reopened upto 1980 by excavating new channels and remodelling of existing Canals in phase I. Areas shown in red (Fig.1.) hatchets (101000 acres) are being reopened. Canals are being constructed in phas II and it is expected that this project will be completed by the end of 1987-88. Areas shown in red hatchets (85,000 acres) are proposed to be taken up in Phase-III. Scheme has been submitted to the Government. This project is expected to be completed in the next four years approximately.

(iii) State Disty Lift Irrigation Scheme from Eastern Sadiqia Canal.

This scheme was completed during 1979. The scheme provides Irrigation facilities to an area of 63000 acres which was previously Irrigated from State Disty of Eastern Gray Canal off-taking from Ferozepore Headworks in India.

FUTURE DEVELOPMENT.

Following three projects can be taken up which will go a long way in the total development of Cholistan:-

| S.No. | Project No. | Name of Project | Culturable commanded area (in acres). | Authorised full supply (perennial) | Canal supply conveyance route |
|-------|-------------|---|---------------------------------------|------------------------------------|--|
| 1. | 2 | Reopening abandoned areas on Hakra Branch of Sadiqia Canal. | 1,12,891 | 633 Cs. | Eastern Sadiqia Canal through Qadirabad Balloki Link, Balloki Sule-Manki Link. |
| 2. | 9 | Extension of Irrigation to Smaller Cholistan. | 4,56,401 | 2600 Cs. | Eastern Sadiqia Canal through Trans-Punjab Link. |
| 3. | 10 | Extension of Irrigation to Greater Cholistan | 22,73,334 | 13674 Cs. | New Canal from Sulemanki Headworks and the Trans-Punjab Link. |

Detailed projects have been prepared after necessary surveys and investigations. Brief description of each is given here-under:-

Extending Irrigation to abandoned areas on Hakra Branch of Eastern Sadiqia Canal.

Eastern Sadiqia Canal and its Hakra Branch were constructed in 1927 under the Sutlej Valley Project. Original gross commanded area on Eastern Sadiqia Canal was proposed to be 1078640 acres. Colonization was found difficult due to a big economic slump in the market value of land and its produce

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due to world wide depression of 1930-32.

Sutlej Valley Project Inquiry Committee headed by Sir Bernard Darley recommended in 1932 to abandon comparatively inferior lands at the tail of Hakra Branch of Eastern Sadiqia Canal. The area so abandoned amounted to a Gross Culturable Area of 126582 acres out of which 112851 acres is culturable commanded area. This area lies on 1-L/Hakra Left and Hakra Right Distys. In this area channels had been constructed with all their masonry works, railway line was laid from Bahawalpur to Fort Abbas and all railway stations etc. had been constructed. After abandonment of this area, the railway line was also dismantled although its embankment exists and the buildings are lying in delapidated state.

BOUNDARY.

The area included in this Project consists of entire abandoned area of Hakra Left and Hakra Right Distys, at the tail of Hakra Branch of Eastern Sadiqia Canal. The area is shown in Violet shade.

SURVEY AND INVESTIGATION.

The area is already surveyed and rectangulated for Sutlej Valley Project. Since then due to drift sand the position of sand dunes would have been altered to some extent. It would require detailed survey for alignment of channels.

SOILS.

The Darley Committee of 1932 considered abandoned area on Hakra Left as a poor land of alkaline nature. After development of Irrigation in the adjoining area on Hakra Left and Hakra Right Distys, it has been established that the land is good. The only requirement is Canal Water.

LAND USE.

Most of this area is State Land. Most of it was abandoned after allotment due to non-availability of canal supply & poor colonization.

GROSS CULTURABLE AREA/CULTURABLE COMMANDED AREA.

As stated above, the Gross Culturable Area is 126582 acres and Culturable commanded Area is 112851 acres.

INTENSITY.

As per original project and in the adjoining area, intensity of Irrigation is proposed to be 80% with Kharif-Rabi ratio of 1:1.50. Since the sub soil water is brackish, the supply will have to be perennial as the colonists will have to depend even for drinking supply on canal water. The sub soil water is unfit for drinking as well Irrigation.

WATER ALLOWANCE.

As in case of adjoining perennial area, it is proposed to allow the water allowance of 4.25 Cs%o acres of Culturable Commanded Area.

WATER REQUIREMENTS.

Water requirement of this area at outlet head works out to 430- Cs. Allowing for 10% losses in the channel and 20% losses in the Branch and the Main Canal, total additional discharge requirement at head of Sadiqia Canal works out to 633 cusecs. This will be a perennial supply.

AVAILABILITY OF WATER.

Additional supply of 63 Cs is required at head Sulemanki. During floods in river Chenab it may be possible to have this additional supply diverted through Qadirabad Balloki and Balloki-Sulemanki Link to Sulemanki Headworks but in other months the supplies will have to come from Mangla through Rasul-Qadirabad Link. Necessary remodelling of these Links will of course be necessary. For all the projects of Bahawalpur Division depending on Sulemanki, a study of water availability will have to be carried out which can be arranged on WAPDA Computer System.

ESTIMATE OF COST.

Estimate of rough cost amounts to Rs. 63.63 million. This estimate includes remodelling of Eastern Sadiqia Canal. In the context of over all requirements of supply and necessity of remodelling of existing Links or construction of new Links and remodelling of Sulemanki Headworks further proportionate cost will have to be charged to this estimate.

FINANCIAL FORECAST.

Since this project will reopen Irrigation facilities to over a lac of acres state land, Rs. 400 millions approximately are likely to be gained by way of sale of land at an average rate of Rs. 4000/- per acre.

EXTENSION OF IRRIGATION TO STATE WASTE LANDS IN SMALLER CHOLISTAN

Shown in brown shade, 570500 acres

This scheme for extending Irrigation to state lands of Smaller Cholistan is proposed for an area which was only surveyed with five feet contours and found minor Irrigation but was not included in the Irrigation boundary because of limitation of supply available in the rivers.

Only a small part of this area can be commanded by Bahawal Canal from Head Islam. Although all the remaining area of this scheme lies just south of Bahawal Canal, yet it is not commanded there-from and can only be commanded from Eastern Sadiqia Canal by extension of Fateh and Murad Distys into this area.

BOUNDARY.

The area proposed in this scheme is interlocked within the Irrigation boundaries of Bahawal Canal on the south and Eastern Sadiqia Canal on the south.

SURVEYS & INVESTIGATIONS.

This area has not been rectangulated and surveyed in detail, however, 5 feet contours are available and reconnaissance survey has already been made by a party headed by Executive Engineer. Most of the land is flat and varies from good to very good soil.

LAND USE.

The entire area under this scheme is state waste land which will be available for sale on auction or

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allotment on Abadkari terms.

GROSS CULTURABLE AREA/CULTURABLE COMMANDED AREA.

Gross Culturable Area of this scheme is 570501 acres out of which 456401 acres is culturable commanded area.

INTENSITY.

As in case of adjoining area, it is proposed to have an intensity of Irrigation of 80% with Kharif-Rabi ratio 1 : 1.50.

WATER ALLOWANCE.

As in case of neighbouring area, it is proposed to give a perennial Water allowance of 4.25 Cs per thousand acres.

WATER REQUIREMENTS.

Requirement of supply at outlet head works out to 1940 Cs. allowing for 10% losses in absorption and evaporation in Distys and 20% in main canal and branches, total additional requirement of canal water supply at the head of main canal (Eastern Sadiqia Canal) will be 2561 Cs; say 2600 Cs.

AVAILABILITY OF WATER.

Availability of water at Sulemanki for this scheme will be got examined on WAPDA Computer System.

TECHNICAL.

Eastern Sadiqia Canal off-takes from Sutlej River from Sulemanki Headworks. The existing regulator of Eastern Sadiqia Canal is designed for 4917 Cs. It is now proposed to increase its capacity by 2600 Cs. for this project. The canal will require extensive remodelling.

At the Headworks present pond level can be maintained, however, it can be examined if it will be feasible to raise the pond level. The Headworks will require substantial remodelling in that case.

For conveyance of additional water to Sulemanki, Balloki-Sulemanki Links I & II, Rasul-Qadirabad and Qadirabad Balloki Links will also have to be remodelled.

Perhaps it will be possible to arrange this additional supply from Indus through a Trans-Punjab Link.

Fatch Disty with original capacity of 430 Cs. and Murad Disty with original capacity of 595 Cs. are proposed to be extensively remodelled to function as Fatch Branch with a discharge of 1596 Cs. and Murad Branch with a discharge of 1747 Cs. at Head.

ESTIMATE OF COST.

Rough cost estimates have been prepared for new channels as well as remodelling of old channels. The total cost of the scheme works out to Rs. 674.77 million.

The estimates of cost with regard to remodelling of Headworks and remodelling of Link channels or construction of new Links will be prepared when a study of water availability is completed by WAPDA and it is also ascertained as to how this supply will be carried from Indus to Sulemanki.

FINANCIAL FORECAST.

Although estimates of cost have not been worked out in detail, it can be said quite confidently that the scheme will be highly remunerative as entire area is state waste land and will fetch easily an amount of Rs. 1825.56 millions approximately by way of sale of land by auction or its allotment on Abadkari conditions.

EXTENSION OF IRRIGATION TO STATE WASTE LANDS IN GREATER CHOLISTAN

(Shown in red)

This scheme proposes extension of Irrigation to State Waste Land in Greater Cholistan.

BOUNDARY.

There is 7000 Sq. miles Cholistan area south of old Hakra river which roughly passes along present Irrigation boundary of Eastern Sadiqia, Bahawal, Abbasia and Panjnad Canals. This area goes upto Indo-Pakistan Border of old bekanair and Jasalmair States now Rajistan State. This area was not taken into consideration for bringing into Irrigation boundary of any canal in the Sutlej Valley Project. So far no means of Irrigation are provided for this area. This area was left out on account of difficulties being experienced at that time in the colonization and shortage of canal supply. Out of this vast area about 50% consists of high desert ranges and remaining 50% area is cultivable. The area proposed to be brought under Irrigation is 34,10,000 acres Gross Culturable area & 22,73,334 acres culturable commanded area; out of which 7,08,000 acres have been kept on lift Irrigation and the rest 15,64,634 acres on flow Irrigation. This entire area has been classified as good cultivable by the Revenue Officers of this Division.

SURVEY & INVESTIGATIONS.

Although contour survey and rectangulation of this area has not been done so far, the boundaries of the commanded area, gross culturable area, culturable commanded area, on lift and flow and alignment of main canal, branches and Distys have been ascertained with the help of following:-

- (a) Topographical survey plans.
- (b) Natural surface levels available along the north side of this area from east to west in the length of 200 miles in existing Abadi.
- (c) Natural surface levels available throughout the boundary of old Bekanair state.
- (d) Spot levels available along the proposed main canal.

SOIL.

Information about quality of soil about this area has been taken from the records of Revenue Department. This area consists of countless meadows, numerous grassy grounds and a few ranges of dunes of drift sand. The area has got very scarce rainfall (4.7 inches per annum). Thousands of cattle such as camels, cows, sheep and goats breed on the grass which grows on this little rain.

Inspection of this area and topographical survey shows that the land is good and flat. Even fodder crops are planted in some parts of this area on rainfall.

Historically this area was formed by meandering of river Hakra which is the old bed of river Sutlej. Thus it is quite realistic to assume that this area will be as fertile like the present Irrigated areas on the banks of river Sutlej.

LAND USE.

The entire culturable commanded area of over 2.27 million acres is State Waste Land and will be available for sale by auction on Abadkari terms. The soil of this area can be classified as sand dunes, white dahars, the Hakrandwala dahar and the Red Dahars. The white dahars are extremely hard clay with no vegetation. The Hakrandwala dahar is a mixture of sand and Kankar and relatively there is little vegetation on it. The third type i.e the red dahars is most common and occupies largest area in Cholistan. This is fertile soil and all sort of vegetation grows on it. It is this type of soil only which is included in culturable commanded area of this Project.

GROSS CULTURABLE AREA/CULTURABLE COMMANDED AREA.

| | | | |
|---|---|-----------|---------------|
| Total area. | = | 44,01,300 | acres approx. |
| Uncommanded area (high land). | = | 10,03,000 | " |
| Gross culturable area. | = | 34,10,00 | " |
| Total culturable commanded area (on flow & lift Irrigation). | = | 22,73,334 | " |
| Culturable commanded area on flow Irrigation. | = | 15,64,534 | " |
| Culturable commanded area on lift Irrigation. | = | 7,08,800 | " |

INTENSITY.

As in case of other perennial area of Bahawalpur Div., proposed intensity is 80% with Kharif-Rabi ratio of 1 : 1.50.

WATER REQUIREMENT.

For culturable commanded area of 22,73,334 acres, a discharge of 10661 Cs. is required at outlet head. Allowing for 10% losses in distributaries, 10% losses in Branches and 20% losses in Main Canals (due to a lengthy route involved) final capacities have been calculated as under:-

| | | | |
|-------|-------------------------------|------|-----|
| (i) | Direct Disty of Firdus Canal. | 3633 | Cs. |
| (ii) | Mouj Branch. | 2501 | " |
| (iii) | Bijnout Branch. | 2551 | " |
| (iv) | Bhagla Branch. | 2099 | " |
| (v) | Nawankot Branch. | 2990 | " |

Total 13674 Cusecs.

Firdus Canal will off take from Sulemanki Headworks and flow along Eastern Sadiqia Canal System, to command this entire area of Cholistan, right up to sind Border. The discharge will be perennial as the entire commanded area has very brackish sub soil water which is unfit for drinking as well as Irrigation purposes and therefore human and cattle population will have to live on canal water even for drinking purposes.

AVAILABILITY OF WATER.

This canal requires large supply of water at Sulemanki which will not be available from Jhelum-Chenab component and will have to be looked for from Indus. Probably it will be possible to meet the Rabi and early Kharif requirements from Tarbela storage provided sufficient allocation is provided. The supply will have to be brought through a Trans-Punjab Link from Indus. The availability of supply will have to be examined by WAPDA on computer study. The study will also include investigations regarding meeting with requirements of supply at Sulemanki from Indus and works required to be constructed for the purpose. Kalabagh Dam will most probably solve the problem of availability of this supply.

TECHNICAL.

The proposals are marked on plan which will show roughly the alignment of the main canal & its branches. All these canals will have to be constructed altogether new and hence their regulators will also be constructed. Firdus canal will off take from Sulemanki Headworks U/S of Sadiqia Canal.

ESTIMATE OF COST.

The estimates of rough cost prepared for construction of Firdus Canal system only alongwith its head regulator amounts to Rs. 7849.13 million. A lot more will have to be spent on remodeling or reconstruction of Headworks and Links from Indus to Sulemanki for all these proposals. Estimates will have to be worked out in detail if the Project is approved in principle.

FINANCIAL RETURNS.

Although detailed and total estimates of cost have not been prepared so far, it can be said with certainty that this scheme will be very remunerative as it will fetch over Rs. 9093.34 millions to the Provincial Exchequer through sale of land or its allotment on Abadkari terms at Rs. 4000/- per acre.

With the completion of the above Projects, we will be Irrigating a large part of Cholistan. Low level surrounding sand dunes will be converted into culturable lands by the farmers who are always keen to expand their holdings. Past experience has shown that cultivation is progressing fast into adjoining areas wherever water is available. One day major part of Cholistan will become land of Valleys and Meadows.

With the development of irrigation/agriculture, great strides can be made in the fields of forestry, livestock and small industries based on indigenous products.

IMPACT ON THE NATIONAL ECONOMY.

Development of Cholistan will revolutionize the agro-economic conditions in the country. Hundreds of farming families will be settled in the Cholistan lands. Crops worth billions of rupees will be produced every year. Main crops of the area are foodgrains (mainly Wheat), Cotton and Sugarcane. Soil is

excellent. Reopened areas are producing bumper crops. Thousands of farmers will reap direct benefits by tilling the lands while the rest of the nation will be benefitted indirectly by huge agricultural produce.

A table showing the economic benefits is given below:-

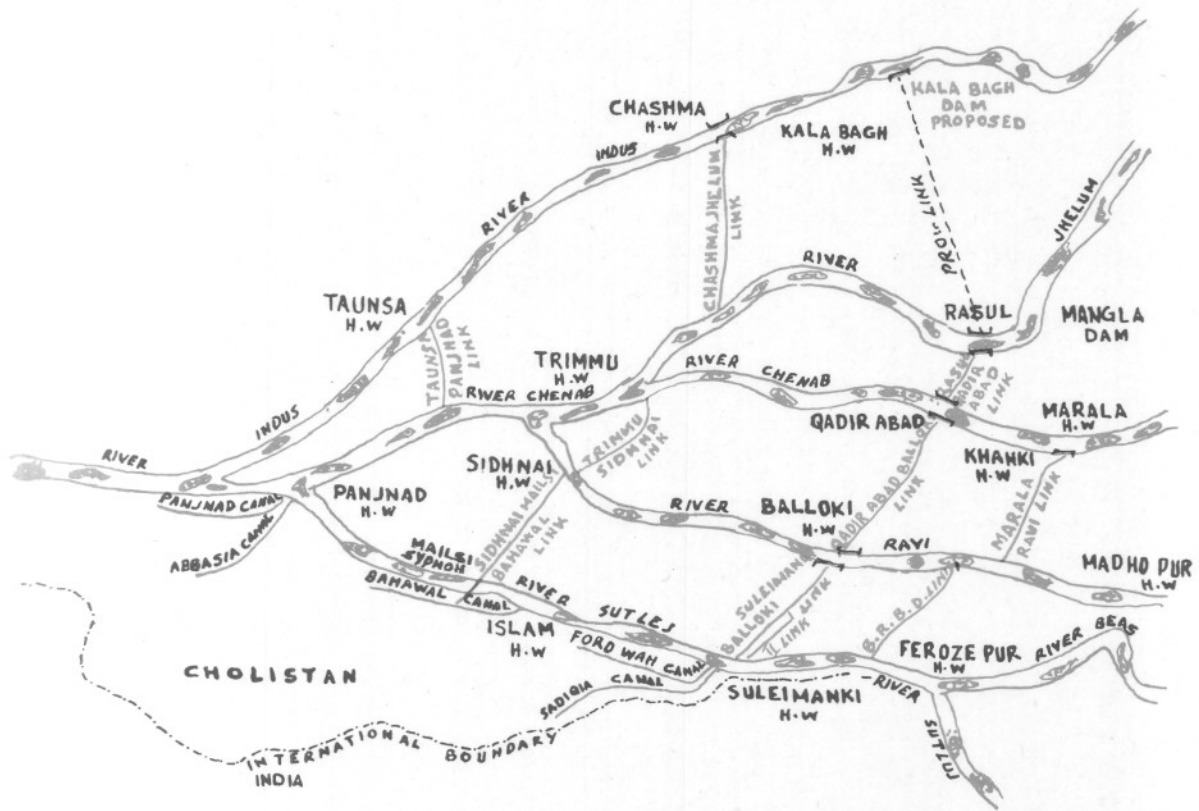
| S.No. | Culturable area (in Project acres). | Famillies to be million 12.5 acres per family. | Farming Population settled at bers per | Value of annual agricultural at 5 mem- Rs. 3000/- per family. | Produce at acrs. |
|-------|---|--|--|---|-------------------|
| 1. | Reopening abandoned areas (in progress) | 0.36 | 28800 | 144000 | Rs. 1.08 billion |
| 2. | Future development Schemes. | 2.82 | 225600 | 1128000 | Rs. 8.46 " |
| | Total:- | 3.18 | 254400 | 1272000 | Rs. 9.54 billions |

The above table shows that crops worth billions of rupees will be produced which will not only make the country self sufficient but enable us to export the products. This is a great potential which must be utilized by us. We should harness this reserve wealth to the service of the nation. The only questionable factor is 'WATER'. This is the issue which is required to be resolved at the national level. The desert can be converted into fields and orchards if we take up the matter at the national level.

COST.

Cost of developing Cholistan will no doubt be high but it can be met with very easily from the sale proceeds of land. It is proposed to reserve 10% land for local landless tenants. The remaining land if auctioned will fetch huge amount. Even if the land is sold at a nominal rate of Rs. 4000/- per acre, it will yield about Rs. 12.72 billions.

KEY PLAN
SHOWING
BARRAGES & LINK CANALS
IN THE PUNJAB





REFERENCES

| | C.C.A |
|--|-----------------|
| 1 AREA BEING IRRIGATED BY EXISTING CANALS | 38,30,000 |
| 2 RE-OPENING ABANDONED AREA & EXTENSION OF IRRIGATION ON ABBASIA CANAL | 1,17,000 ACRES |
| 3 RE-OPENING ABANDONED AREA & EXTENSION OF IRRIGATION ON BAHAWAL CANAL PHASE I | 97,000 ACRES |
| 4 RE-OPENING ABANDONED AREA & EXTENSION OF IRRIGATION ON BAHAWAL CANAL PHASE II | 1,01,000 ACRES |
| 5 RE-OPENING ABANDONED AREA & EXTENSION OF IRRIGATION ON BAHAWAL CANAL PHASE III | 85,000 ACRES |
| 6 LIFT IRRIGATION OF STATE DISTY | 63,000 ACRES |
| 7 RE-OPENING ABANDONED AREA OF EASTREN SADIQIA CANAL | 1,12,891 ACRES |
| 8 EXTENSION OF IRRIGATION TO CROWN WASTE LANDS IN GREATER CHOLISTAN | 22,73,334 ACRES |
| 9 EXTENSION OF IRRIGATION TO CROWN WASTE LANDS IN SMALLER CHOLISTAN | 45,64,01 ACRES |