

VISIT REPORT

2022



E-Abiana System, Punjab Irrigation Department, Lahore

Sindh Irrigation & Drainage Authority (SIDA)

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[SINDH IRRIGATION & DRAINAGE AUTHORITY]

Visit report of SIDA Delegation to Punjab Irrigation Department, Government of Punjab from 18th July to 23rd July 2022 at Lahore, Pakistan

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1- Introduction

Irrigated agriculture in Pakistan is under immense pressure because of emerging challenges of food security, competing demands among sectors and climate change. The supply side solutions have been either exploited or difficult to pursue due to cost and other socio-political factors. On the other hand, demand side measures remained limited to improving water conveyance efficiency. This option has been tested for last four decades, yet the actual water saving as well as its true economic potential could not be determined as much of the water saved in this way comes at a cost of diminishing aquifer recharge and downstream return flows. Cost recovery for irrigation system maintenance is low, with the assessed water use charges or abiana themselves not reflecting the cost of service provision. The important option of pricing water properly for improvement of water use efficiency is yet to be tested in Pakistan. Increasing cost recovery for maintenance of infrastructure may improve financial sustainability of irrigation system while encouraging farmers to choose either efficient irrigation methods or increase productivity.

The Indus Basin Irrigation System comprises of three major reservoirs, 16 barrages, 2 head-works, 2 siphons across major rivers, 12 inter river link canals, 44 canal systems (23 in Punjab, 14 in Sindh, 5 in KPK and 2 in Baluchistan) and more than 107,000 water courses.

Sindh has 14 publicly owned irrigation systems, which receive water from three barrages across the River Indus. These systems, with an aggregate length of 18,000 km of canals, serve an area of about 5.38 million hectares. During the year 1999-2000, the total irrigated area, using all sources in Sindh, was of the order of 3.52 million hectares. This included 2.39 million hectares of irrigated land in the canal commands. The private tube wells and wells irrigated 0.13 million hectares during the same period.

The issue of poor cost recovery in irrigation system is not unique to Sindh province which makes the irrigation system in Sindh financially unsustainable. Average Abiana recovery was 36% of the average O&M cost during 2001-02 to 2019-20, showing an overall widening gap between recovery and O&M cost. In Sindh province, the Abiana recovery to assessment ratio remained significantly high, and encouraging. However, Abiana assessment and recovery dropped off by 40% each during 2000-01 to 2009-10. (Ref: *Study of Planning Commission. GoP, June 2012*). The Rice and cotton crop have been priced almost same, though rice consumes more water than cotton. This kind of water rate system acts as incentive for promotion of inefficient use of water.

Under reformed governance model the financial performance of three Area Water Boards (AWBs), i.e. Nara Canal, Left Bank Canal and Ghotki Feeder Canal, was satisfactory reforms i.e 98% but slowly and gradually it remained unsatisfactory by recovering an average 58% of the assessed amount during 2003-04 to 2020-21.

2- History of Water Pricing for Irrigation in Pakistan

Pricing canal water was officially recognized by the British rulers of India through Punjab Canal and Drainage Act 1873. Article 36 of this Act states that “*the rates to be charged for canal water supplied for the purposes of irrigation to the occupiers of land shall be determined by the rules to be made by the Provincial Government and such occupiers as accept the water shall pay for it accordingly*”. However, the first schedule was implemented in 1891 on Upper Bari Doab Canal. Later on the water pricing was extended to other canal command areas with the rates being revised from time to time. The chronological order of water charges or *Abiana* in Sindh province is given in Table 1 below.

Table 2: Provincial periodic increases (percent) in water rates from 1963 to 1993

Year	Sindh
1963	<i>Abiana</i> rates increased by 10%
1965	<i>Abiana</i> rates increased by 10%
1968	<i>Abiana</i> rates increased by 20%
1969	<i>Abiana</i> rates increased by 15%
1977	<i>Abiana</i> rates increased by 25%
1980	<i>Abiana</i> rates increased by 25%
1981	<i>Abiana</i> rates increased by 25%
1982	<i>Abiana</i> rates increased by 25%
1985	<i>Abiana</i> rates increased by 10%
1991	<i>Abiana</i> rates increased by 0%
1993	<i>Abiana</i> rates increased by 0%
1999	<i>Abiana</i> rates increased by 0%

3- Rates of Abiana

The rate of *abiana* is based on acreage of crops. For example, *abiana* is equal to the number of acres of a particular crop times the rate for that crop. The rates charged for Kharif and Rabi seasons vary and are also different for lift and flow or gravity irrigation systems. The rates for government lift schemes are about double the gravity rates, while the rates for private lift schemes are about half the gravity rates. Each of the three barrages (Sukkur, Gudu and Kotri) has separate types of canal systems under each barrage. The rates were specified by the government for various crops and were developed on the basis of water requirements for different crops. The current *abiana* rates by each barrage and by crops are shown below.

Schedule of Water Rates for Kharif Crops in Sindh:

S.No:	Name of Crops	Flow area Rates (Moki) in Rs.	Private Rates in Rs.	Lift area (Charkhi)	Govt: Lift Channel Rates in Rs:
1	Cotton	93.09	46.55		186.3
2	Rice	88.78	44.39		177.62
3	Garden	142.14	71.07		284.17
4	Vegetable	142.14	71.07		
5	Pulses	39.85	19.93		
6	Gowar / Bajra	39.85	19.93		79.58
7	Maize	39.85	19.93		79.58
8	Sugurcan	181.87	90.94		363.69
9	Oil Seed	75.33	37.66		150.65
10	Chillies	75.33	37.66		150.65
11	Banana	142.14	71.07		284.71
12	Hurries	27.02	13.51		
13	Other Kharif crops	39.85	19.93		79.58

Schedule of Water Rates for Rabi Crops in Sindh:

S.No:	Name of Crops	Flow area Rates (Moki) in Rs.	Private Rates in Rs	Lift area (Charkhi)	Govt: Lift Channel Rates in Rs.
1	Wheat	53.3	26.65		106.61
2	Garden	142.14	71.07		284.17
3	Fodder	53.3	26.65		106.61
4	Vegetable	142.14	71.07		284.17
5	Pulses	53.3	26.65		106.61
6	Oil Seed	53.3	26.65		106.61
7	Hurries	27.03	13.52		53.99
8	Druges	75.33	37.67		150.65
9	Banana	142.14	71.07		284.17
10	Maize	39.85	19.93		79.58
11	Melion	75.33	37.67		
12	Chillies	75.33	37.67		
13	Onion	142.14	71.07		
14	Other Rabi crops	53.3	26.65		106.61

Water charges in Sindh are collected by the Revenue Department. The Revenue Department at district level works under the Deputy Commissioner, the administrative head of the district and its highest authority. In each sub district there is a assistant commissioner, who supervises the Tapedars and Muktiarkars, that do the assessment and collect the abiana. Abiana is collected with a number of other Provincial taxes, in particular the land revenue, local funds and ushr. Not only collection but assessment as well is traditionally done by the Revenue Department. Official irrigation water charging is based on the area cultivated and the crops grown.

A laborious procedure is required to collect information on these two parameters for an area, as large as Sindh. The basic unit for the assessment is the revenue village (Deh). Revenue assessment is carried out after each major cropping season by Tapedars or Muktiarkars in each deh, supposedly on the basis of walkthrough or field inspection of each farmland. Based on the (often outdated) area map (Deh maps) they identifies each farmland and the owner for assessment purposes. Each farmland is then divided into cropped acreage plots and the assessment of each plot is carried out by applying the rate of abiana for that crop. Under this methodology, the revenue official uses his skill and experience and sometimes arbitrary judgement to determine whether an acre of plot has produced a full yield of crop or some other percentage and then applies that percentage to calculate the abiana charges.

The whole method however is open to manipulation and leads to under-assessment of abiana. Further, there are nine main rates of abiana including for kharif and rabi crops. In addition, rates for government and private lift schemes are double and half the gravity rates respectively. This increases the opportunities for misreporting. For several years the assessment by the Revenue Department was double-checked by ‘‘abdars’’ of the Irrigation Department. The two assessments that usually differed then would have to be reconciled. The assessments by the abdars were generally higher (50%) than those of the Revenue Department. Among farmers there is considerable ill-feeling with respect to the abiana assessment by the Revenue staff, translating in very low willingness to pay. The main complaint concerns the arbitrary assessment of the area under cultivation.

A common grudge is that, as they are forced to be lenient on big landlords, revenue staff try to achieve revenue targets by overcharging smaller landlords. Overall there is considerable underassessment as a result. A second leak in the charging system are the dispensations due to crop failure. These dispensations are wide open to abuse. The total loss because of underassessment – especially underreporting and mis-assessment are huge. One source that looked at fairly accurate crop coverage data and compared them with abiana assessments, estimates that as much as 60% of revenue disappears this way. This figure is substantially higher than the losses due to non-payment. Billing and payment In the traditional system billing is done twice a year by the revenue staff and payment is made to them in cash.

At present customers are expected to pay in January and July at a time when they are relatively short of cash. It has been proposed to shift the billing dates to March, resp. September to make

the payment more convenient and avoid repeated reminders. A larger resentment among land owners than the timing of payment is that often no receipts are given after payment. This makes it questionable how the money is booked. It also increases opportunities of not accounting for special dispensations. Enforcement Non-payment of abiana ranges from 5-10%. This is not high – but this is because the assessment is the main arena for negotiation for those not willing to pay.

Under the traditional system the sanctions for defaulters are financial penalties and next the threat of imprisonment. Closing supplies is not part of the traditional repertoire of sanctions. The difficulty lies in the problem of singling out a single defaulter, if a watercourse supplies several farmers. In the past however it was not uncommon for IPD staff to use the pretext of maintenance to close water to an area with a notorious payment record.

4- Abiana collection Status of Area Water Boards:

SIDA was established as per SIDA Act passed in 1997, the GoS assigned responsibility of abiana assessment & collection to SIDA/AWBs/FOs under institutional reforms program. The agreement between Board of Revenue and SIDA was signed on May 16th, 2001 for assessment & collection of abiana from Kharif 2000 onwards by AWBs beginning from Nara Canal AWB.

Area Board	Water	Year of Establishment	Authorized for Recovery from season	Administrative Districts	CCA (Million acre)
Nara AWB	Canal	1999	Kharif 2001	Mirpurkhas, Umerkot, Sanghar & Khairpur Mir's	2.273
Left Bank Canal AWB		2002	Kharif 2003	Badin, Hyderabad, TMK	1.416
Ghotki Feeder Canal AWB		2002	Kharif 2003	Ghotki & Sukkur	0.851

The respective AWBs/FOs started assessment and collection of Abiana / Water Charges from water users through existing human and financial resources. Moreover, the assessment is mad manually, entered into book of accounts, individual bills are prepared, and collection are made by AWB/FO field staff as per following procedure

1. Updated Karia register is referred to ascertain the status of legal irrigators
2. Field book seasonal entries are made by field staff
3. Field khasra detailing type and area of cultivation for each cultivator
4. Jamabandi register

5. Billing / receipt / challan
6. Cash book maintenance
7. Deposition in bank account. and reconciliated bank account statement

The practice of abiana assessment and collection using ages old manual method by AWBs and FOs have revealed that it is adding up the risk of financial non sustainability of the service providing institutions the record keeping is confusing, customers data bank and important record of abiana payments and outstanding amounts are difficult to track, The major challenges are summarized as follow.

5- Challenges in manual abiana assessment and collection in AWB commands

1. Absence of authentic and accurate data bank of various types of water users in the command areas and
2. Manual record keeping in registers and number of various forms is prone to manipulation of entered data and sometimes non availability due to ulterior motives.
3. The data is not centrally stored but rather kept by the individual field staff members.
4. The assessment area for each staff member is quite large for physical verification of each acre irrigated in each season.
5. There are flaws in check and balance mechanism for accurate booking of data for cultivated areas payments received and outstanding amount payable by water users
6. The access to old record / data base is difficult.
7. Ne mechanism for levy of late payment or nonpayment of water charges by various users.
8. Cash handling.
9. Lack of uniformity in record keeping.
10. Widening gap between assessed cultivated areas and actual recoveries.
11. Non availability of challans forms for abiana payment to the general / interested farmers.

6- Abiana Collection Reforms in Punjab Irrigation Department

Punjab Irrigation Department in collaboration with Punjab Information Technology Board (PITB) developed a digital mechanism for the automation of water charges (Abiana) collection system called as E-Abiana System. The automation of water payment collection system or E-Abiana has been designed to help digitalize water revenue payments from farmers in the form of Abiana, which would be collected by the irrigation department through **e-Pay Punjab**. The primary objective of e-Abiana is to develop a technology-based solution to generate transparency for collecting Abiana from the farmers. In the initial phase, a tech-based system has been introduced in Kasur, Sheikhpura, Khanewal and Layyah regions as a pilot program. Farmers can easily pay Abiana bills through banks, ATMs and through mobile banking. After successful results, such system will be very soon implemented and replicated in whole province.

7- E-Abiana Process followed in Punjab

The data of land holdings and particulars of irrigators provided by Punjab Irrigation department was digitized. Each farmer is allotted **17-digit peculiar consumer number** or identification number and display of record for perusal of irrigators and on spot correction in record with proof.

The PID has hired data entry operators, data processing assistants, who are doing khatta wise/ consumer billing system and generating the bills. The payment of e-bills can be made through all commercial banks, Tele companies and ATMS. Moreover, on spot collection through IT gadgets (tablets and printers) and generation of bills through clubbed IDs has been initiated. The real time monitoring of E-Abiana collection can be viewed and tracking of paid and unpaid bills can also be seen through system and the account statement of each individual irrigator can also be viewed.

8- Background to visit of SIDA Delegation to Punjab Irrigation Department

To improve the Abiana recovery in Area Water Boards, the SIDA Board in its 54th meeting decided to study e-Abiana system developed by Punjab Information Technology Board (PITB) for Punjab Irrigation Department, a digital mechanism for collection of water charges and fines and practiced by Punjab Irrigation Department. The initiative, launched in February 2021 by ID Punjab, has made significantly changed the collection system of water charges by enabling the irrigators to make payments from the comfort of their IT based choices. The bills are electronically generated ensuring transparency and accountability.

In this regard, correspondence made by SIDA to Secretary Punjab ID for visit of the Punjab Irrigation Department (Letter enclosed as *Annexure-1*) and in response, a following detailed schedule of visit was finalized from *19th July to 21st July, 2022*.

S#	Date	Activity	Presented by
A	In House Presentations		
1	19/07/2022	Orientation on Punjab Irrigation Department	Mr. Mohammed Amir Chief of SPRU (Strategic Planning and Reform Unit)
2		Presentation on PMIU On Real \time Flow Monitoring System and Decision Support System	Dr Riaz & Team
3		Presentation on Khal Panchayat	GM PKPA(Punjab Khal Panchayat Authority)
4	20/07/2022	Presentation on E-Abiana	Mr. Sohail Akhtar (General Manager Admin)
5	21/07/2022	Presentation on PMO (Barrage Improvement)	Head PMO Barrages
6	22/07/2022	Presentation on Khanqi Barrage with SCADA	EXen Khanki Headworks
B	Field Visits		
	21/07/2022	Khanqi Barrage	

The following nominated officials of SIDA and AWBs visited Punjab irrigation department to study the e-Abiana system introduced on pilot basis.

S#	Name	Designation	Remarks
A- Sindh Irrigation & Drainage Authority			
1	Mr. Ghulam Mustafa Ujjan	General Manager Transition	Focal Person
2	Mr. Ibrahim Memon	GIS Specialist	Member
3	Ms. Amber Sanam	Assistant Director	Member
B- Nara Canal Area Water Board			
4	Mr. Muhammed Awais Maher	Act. GM FACR	Member
5	Mr. Muhammed Faisal	Assistant Manager IT	Member
C- Left Bank Canals Area Water Board			
6	Mr. Muhammed Akram Lashari	Senior Clerk	Member
7	Mr. Muhammed Faisal	Assistant Manager IT	Member
D- Ghotki Feeder Canal Area Water Board			
8	Mr. Rafio Sultan	Act. GM FACR	Member
9	Mr. Mushtaq Ali Buriro	Act. Manager (CR)	Member

9- Glimpse of Meetings attended by SIDA/AWB Delegation at PID

Introductory meeting at Punjab Irrigation department Secretariat Lahore On 19th July 2022.

Ms Aisha, Additional Secretary (Estb.), Irrigation Department Punjab welcomed the SIDA & AWB staff. After introductory remarks She described the salient features of Irrigation infrastructure of Punjab Irrigation department and its key functions. She appreciated the efforts of SIDA to introduce the pilot E-Abiana system in the command area of AWBs on the lines of PID. She assured the delegation that, maximum help and support shall be extended to the visiting delegation along with the lesson learnt so far and challenges being faced by PID in execution of E-Abiana System in Punjab.



She also appreciated the initiative and hard work of PID to realize this goal with special efforts and input from Punjab IT Department Board.

Mr. Mohammed Amir, Chief of SPRU (Strategic Planning and Reforms Unit) along with his team presented the history and features of Punjab Irrigation system. He said that Punjab is largest province of country and 70% dependable on Agriculture harvesting. He said that Punjab province has 13 barrages, 24 Main canals and 57 small and large dams are functional.



SO far 8 barrages are rehabilitated (6 under ADP and 2 under WB financing) to enhance the life and capacity of the same. He also informed the situation of sweet water in the world. He further briefed on the Punjab Government's encouraging water Efficiency bed and furrow cultivation, in order to maintain canals, initiated taken to line the Canals, replacement of deteriorated irrigation infrastructure, replacement of hydraulic infrastructures.

He also emphasized on implementation of Punjab Water Policy in entire province, and legislation passed from Assembly for comprehensive water resource Management and regulations through Water Act.

He also described measures taken by the department for flood management in the province and remedial measures taken before every flood season in the province.

In also shared that the Reform program has been introduced through E-technologies. Irrigation Department management has carried out studied to introduce E-technology. E-technology has created revolutionary changes to manage the affairs of the department. He informed that within short period of time 2 billion rupees of Abiana recovery has been made and it is also going to be increased day by day. Moreover, Irrigation Department has signed a MOU with Government Engineering Academy to train the fresh Graduate Engineers

Dr. Riaz Ahmed briefed about PMIU. He informed that Program Monitoring & Implementation Unit (PMIU) was established in 2006 in Irrigation Department to implement efficient and optimal canal operations with primary aim to achieve equity and transparency in water management in the province. The core function of PMIU is to monitor the canal operations including discharge observations, calibrations of gauges, development of irrigation management information system (IMIS), and develop decision support system (DSS). This unit collects gauge data of 3150 channels on daily basis along with independent verification of outlet discharge observations using GSM, GPRS technologies. Based upon the daily data received analysis reports are prepared for the management and general public. A robust irrigation management information system in place now supported by a huge data base for entire Punjab province. The daily discharge data is now available on web site of Punjab irrigation department showing entitlements



and actual deliveries, and complaint handling mechanism. The unit is also working on ground water monitoring

Dr Riaz also presented brief on Punjab Khal Panchayet. He informed that, PIDA act was repealed with the promulgation of Punjab Khal Panchayat Ordinance III of 2019 on 22nd May 2019. Punjab Khal panchayet Authority plans to ensure the participation of the farmers at the watercourse level throughout the Punjab by establishing Khal Panchayats at each Water courses as per section 3(1) PKP act 2019.

Overall 56133 Khal Panchayats are to be established on 21 canal circles of irrigation system. The authority hierarchy set as Chairman with 6 farmer members, including

(2 Female members, 2 non-farmer members, Secretary Irrigation, Agriculture and Finance Departments of Punjab, Managing Director as ex-officio member. He also informed about the core functions of Khalpanchayet.

Detailed presentations on E abiana in Punjab -20th July 2022,

Mr. Sohail Akhtar (General Manager Admin), briefed the forum about E-Abiana, he said this project was initiated by Capt. Saif Anjum (The than Secretary Punjab Irrigation Department) with a vision to realize the economic value of the water and collect water charges accordingly. Initially E-Abiana was started in 4 divisions as pilot project with the team of PITB to measure the merits and demerits of such system and based upon the findings the system will be introduced in entire province

At the onset a MOU was signed between Punjab Irrigation Dept: and PITB to develop such program which play role in betterment of department and enhance accountability and profitability in terms of increase in Abiana recovery in professional and transparent manner. Initially the PITB team started digitizing the complete data received from irrigation department and developed the software according to required standards. It was a difficult task in order to digitization of 100 year old manual record. The



drawbacks of manual system were manipulation old data by girdwari, there was no legacy account of consumers, manual system of collection through lumberdar, consumer was unaware about what is he paying for and end up paying extra Abiana. He gave brief information about the impact of E-Abiana on recovery and its implementation. Detailed description is narrated in the latter part of this report along with attached presentation is enclosed as *Annexure-A*

Detailed presentation on Project Managment office Barrages and Canals On 21st July 2022, the Project Management Office (PMO) gave brief presentation and informed that PMO was established in 2004 under the Irrigation Department for carrying out the feasibility studies , detail designs & implementation, rehabilitation and modernization of barrages in Punjab province. Punjab Barrages Rehabilitation Project was initiated in 2004, in principle, for the purpose of seeking financial assistance from donors with the direction that individual projects would be prepared on basis of feasibility studies. The PMO works under the administrative control of Secretary irrigation Punjab and is responsible for procurement of major consultancies for the barrages rehabilitation works, review of feasibility studies , pre-qualification and bidding documents , oversee consultants during project execution , contract management , financial management and ensure compliances of environment and social safeguard policies of the donors.



Project Management Office PMO Canals was established in 2017. P.M.O has initiates projects to rehabilitate the canals with the financial assistance from Asian development bank, World Bank and under PSDSP project. The PMO canals is playing a pivotal role in centralizing the planning , preparing feasibilities , detail designs and supporting execution of main canals , branch canals and minor canals rehabilitation works through out the Punjab province.



Presentation on SCADA and field visit to Kahnki Barrage - 22nd July 2022.

The SIDA / AWB team left for Kahnki Barrage through Lahore Sialkot Motor way. KB head works was constructed during 1892 and is one of the oldest weirs in the subcontinent. The weir has deteriorated and outlived its life. A new barrage has, being constructed at a distance 900 ft. from the existing weir in 2013. The barrage has been operated under SCADA technology (new technology for operation) through this system the barrage has been operated very smoothly, the local and as well as Manual Hydraulic system is also adopted. Through



SCADA system the barrage administration with the convenience of technology operates the gates of barrage and monitor water regulations, as well as the data has been gathered through Real Time Flow Management (RTFM). Detailed presentation is enclosed as *Annexure-7*.

GIS/ RS Team: Through GIS technology daily flood situation mapping and monitoring for Punjab province is in practice. It is a daily transboundary precipitation monitoring system based upon GIS for pre flood inundation mapping for districts, tehsil or villages which are under threat. The program prepares GIS based flood route prediction and monitoring in breach scenario by using GIS atlas. It also developed geo-data bases of historical floods, digital elevation models and stream networks, flood management atlas for Punjab province, demarcation of classified flood extents for all rivers, hill torrents and major nalahs in Punjab and divisions and zone wise flood plain demarcation.

10- The Punjab E abiana experience has been initiated with following actions

- Digitization of 100 years old manual CCA record along with details of current irrigators replacing manual record keeping and abiana collection.
- Crop wise updated land record information system for easy and accurate assessment of water charges. Taawan and outstanding dues.
- Abolition, creation and upgradation of various posts, with focused creation of IT based establishment.
- MoU signing with PITDB for digitization and E billing.
- Mass awareness campaign and capacity building activities for staff.
- Using IT gadgets, tablets and thermal printers.
- The entire process is also experiencing issues in digitizing , data entry and verification , bill generation printing and distribution , recovery , resistance by vested interests,
- The department is developing solutions for such issues through preparing fresh girdawari, its display, correction, hiring of additional IT based staff, dash board development, e payment through commercial banks, Tele companies, and ATMS.
- The system enables real time monitoring of e abiana collection, paid and unpaid bills and account statement of individual irrigators viewing.
- The abiana collection has been linked with **E Pay** mode of payment which is being used for collection of other taxes of Punjab govt such as motor vehicle tax, property tax etc.

- The E Abiana systems has created ease of payment to the abiana payers, transparency, and efficient record keeping and on line verification of all payments made to the exchequer.
- The system provide at site cumulative collection of Abiana through gadgets using Ziladar app and issuance of at site receipt through electronically connected thermal printers.

11- Way Forward

- Initiating E-Abiana in Sindh on pilot basis requires
 - Identification and notifying a subdivision as pilot for E abiana
 - Negotiation and agreement for E payment method through Pak pay, tele companies or commercial banks.
 - Digitization of complete records of lands and land entitlements , irrigators , commercial and industrial water users
 - GIS maps for each water course command
 - Allocation of subscription number to each water user and irrigator.
 - Engaging staff for crop assessment and data analysis
 - Use of Remote sensing technology for crop assessment
 - Printing and distribution of Abiana bills
 - Outsourcing of Abiana collection to any agency including BoR, SRB or third party
 - Digitized record of Abiana assessment, collection and outstanding balance and periodic audit of record.

12- Conclusion

Based upon the learnings from Punjab it is recommended that E abiana mechanism can be introduced in pilot sub divisions of Ghotki Feeder Canal, Nara Canal and Left Banks Canal Area Water Boards on priority basis.