

PARTICIPATORY IRRIGATION MANAGEMENT AND ITS ROLE IN GREEN ECONOMY

By

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1. Introduction and Background

Punjab Irrigation System was established more than a century ago, mainly operated under Gravity and was rated as one of the best in the world. However due to population growth, Administrative inefficiencies and increased irrigation intensities, system was over stressed leading to poor service delivery. Institutional Reforms were introduced in Irrigation sector during 1997 focusing on decentralization, participatory irrigation management and improved service delivery. Under this changed management for implementation of reforms process the current functions of irrigation department are being shared by establishing the new institutions viz. Punjab Irrigation and Drainage Authority (PIDA) at provincial level, Area Water Board (AWB) at Canal Command level, Farmers Organizations (FOs) at distributary level and Khal Panchayats (KPs) at water course level.

A comprehensive legal frame work has also been developed for smooth functioning of this management shift. In this scenario, the FO is a basic farmer-managed unit responsible for irrigation management, operation and maintenance of distributary / channels, abiana assessment / collection and protection of environment within its area. Below PIDA, quasi-autonomous AWBs have been established responsible for operation and maintenance of irrigation network, monitoring, supervision and providing support to FOs.

The main role of FO includes **Abiana collection, equitable water distribution and more importantly better Environment**. The Participatory Irrigation Management (PIM) being based at the grass route level could play a vital role to achieve this objective. Under the present scenario the projects are executed without proper environmental analysis at the distributary level and as such analysis carried out is not the true Reflection of ground situation / realities.

How far this Participatory Irrigation Management has been succeeded to achieve its defined role, brief discussion / analysis is being presented in the paper. Although currently there are constraints and more input is required in terms of Capacity Building and awareness creation among the community but it is also beyond any doubt that if the transition Management is enforced in real terms then this is key for success of better irrigation, enhanced resource generation and reduction in environmental degradation. These positive indicators will substantially contribute for economic growth and environmental improvement.

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Three pilot FOs formed in Bahawalnagar Canal Circle during 2000 followed by pilot AWB LCC (East), Faisalabad. Thereafter four AWBs- LCC (West), Derajat Canal Circle D.G Khan, Bahawalnagar (BWN) and Lower Bari Doab Canal (LBDC) Sahiwal have been established/notified and their operationalization has either completed or under process. Five AWBs comprising of 401 FOs and 19404 Khal Panchayats have been established so far. The setup of reforms tiers and latest operational activities of AWBs are as under :

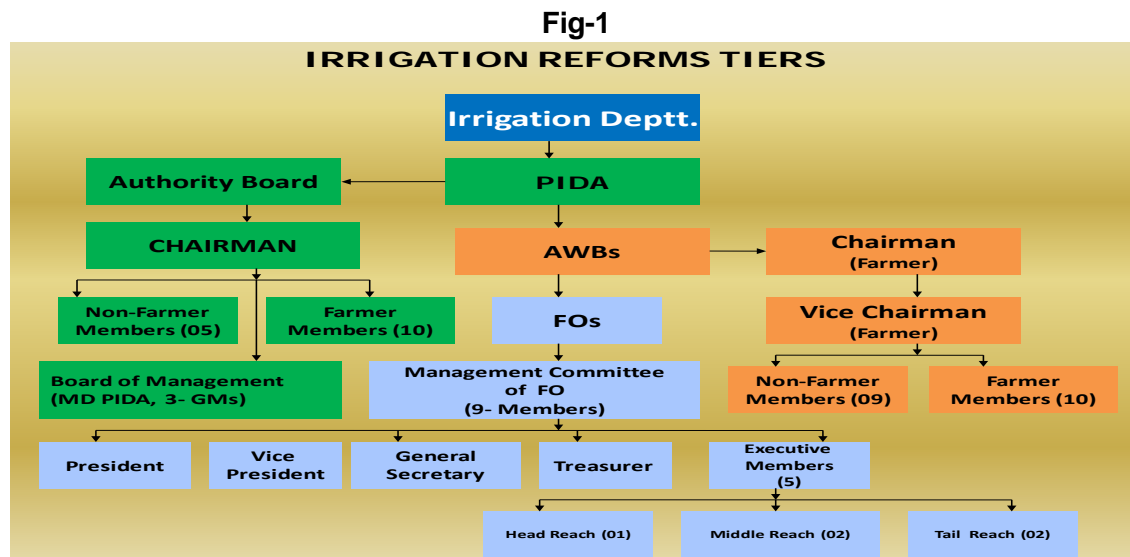


Table-1: Reform Status

Sr. No.	Area Water Boards (AWBs)	FO /Admn Tenure	Target FOs	Duration	FOs formed	Remarks
1	LCC(East), Faisalabad	1 st FO tenure	85	March 2005 to Dec.2008	84	- 1 FO under Litigation - 1 st FO tenure is completed
		Admn. Tenure	85	January 2009 to Feb. 2011		
		2 nd FO tenure	85	February 2011 to onward	71	Formation of remaining 14 FOs in Process
2	LCC(West), Faisalabad	1 st FO tenure	67	Aug 2007 – March 2011	65	- 2 FOs under Litigation
		*Admn. Tenure	67	April 2011 to-date		- Election for 2 nd tenure FOs is in process
3	LJC Circle Sargodha	1 st FO tenure	6	July 2007 to March 2011	6	
		*Admn. tenure	6	April 2011 to-date		- Election for 2 nd FOs tenure is in process.
4	CRBC, (Derajat Circle) D.G. Khan	1 st FO tenure	30	2007 to March 2011	30	- 1 st FO tenure is completed
		*Admn tenure	30	April 2011 to-date		- Election for 2 nd FO tenure in CRBC and IMT to further 90 FOs is underway in Derajat Canal Circle, D.G. Khan.
5	Bahawalnagar	1 st FO* tenure	70	March 2011-to-date	69	- 3 FOs formed in 2000. - 1 FO formed in 2010. - 1 FO Under process
6	LBDC, Sahiwal	1 st FO* tenure	53	Feb 2012	52	1 FO under litigation.
Total			401			

*FO: Farmer Organization

*Admn : Administrator's Tenure

The first Pilot Area Water Board was established in LCC (E) Faisalabad, wherein 84 FOs were formed and Irrigation Management Transferred (IMT) during 2005. These FOs completed their 3 years tenure in 2008. Thereafter Administrators appointed (2009-10). Management has now again been transferred to FOs.

Like-wise 65 FOs were established in LCC (W), 30 FOs in Chashma Right Bank Canal (CRBC), 6 FOs in LJC, and irrigation management was transferred during July / August 2007. All the FOs completed their 1st tenure by March 2011. There after Administrators appointed in all the Boards and election for 2nd tenure is under way.

2. Discussion and Analysis

2.1 COMPARATIVE ANALYSIS OF AWBs IN RESPECT OF ABIANA COLLECTION

Table-2: Abiana Collection of AWBs (%)

Sr. No.	Crop	Collection (%)										
		AWB LCC(East)		AWB LCC(West)		LJC Circle		AWB CRBC		AWB BWN		
1	Rabi 2004-05	1 st FO Tenure	88						3 FOs Pilot (Kh 2000-Kh 2004: 95-78%)	84		
2	Kharif 2005		78							81		
3	Rabi 2005-06		75							84		
4	Kharif 2006		68							83		
5	Rabi 2006-07		79							86		
6	Kharif 2007	64	1 st FO Tenure	90	1 st FO Tenure	95	1 st FO Tenure	34	80			
7	Rabi 2007-08	61		85		95		11	83			
8	Kharif 2008	Admn Tenure	60	1 st FO Tenure	1 st FO Tenure	93	1 st FO Tenure	11	Admn Tenure	72		
9	Rabi 2008-09		62					76		92	6	76
10	Kharif 2009		51					63		92	5	73
11	Rabi 2009-10		53					64		94	4	75
12	Kharif 2010	2 nd FO Tenure	72	Admn Tenure	Admn Tenure	93	Admn Tenure	20	FO Tenure	68		
13	Rabi 2010-11		77					73		93	13	68
14	Kharif 2011		70					70		91	14	80
Aggregate %			68		74		93		14		80	
Remarks		Increasing Trend (53 to 77%)		Increasing Trend (64 to 73%)		Constant		Increasing Trend (4 to 13%)		Increasing trend		

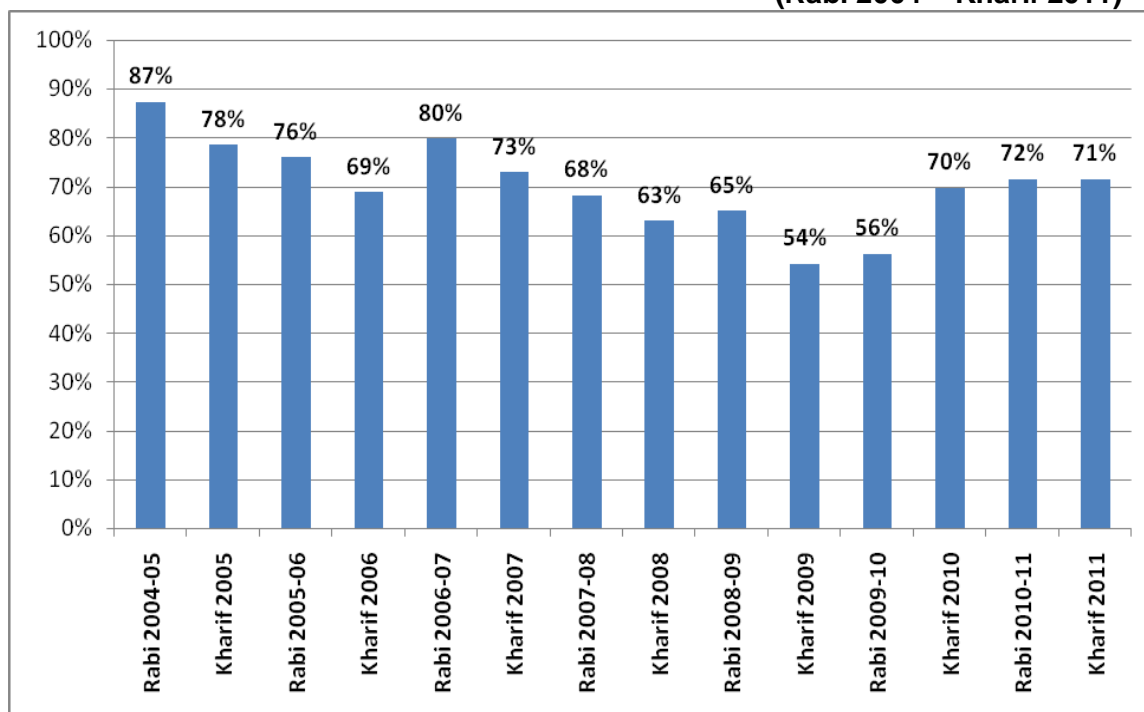
Table -3: Aggregate Abiana Collection of AWBs & PIDA Share
Rs. In Million

AWBs	Net Assessed Abiana	Aggregate Collection since inception	Collection (%age)	Total calculated PIDA Share	Deposited Amount	%
LCC(East), Faisalabad	1219.506	826.708	68	408.658	338.642	83
LCC(West), Faisalabad	608.289	447.947	74	213.393	170.929	80
LJC Sargodha	48.152	44.810	93	20.003	19.925	99
CRBC, D.G. Khan	103.655	14.697	14	7.500	4.327	58
Bahawalnagar	238.885	191.940	80	102.801	85.828	83
Total	2218.487	1526.102	69%	752.355	619.651	82%

Table-4: Categorical status of Abiana of FOs

Abiana Recovery Ranges from :	LCC (East)		LCC (West)		LJC		CRBC		Bahawalnagar	
	No. of FOs (Rabi: 04-05 to Kharif :11)	% FOs	No. of FOs (Kharif: 07 to Kharif: 11)	% FOs	No. of FOs (Rabi: 07 to Kharif: 11)	% FOs	No. of FOs(Kharif:07 to Kharif: 11)	% FOs	No. of FOs (Rabi: 00 to Kharif: 11)	% FOs
0%	3	341 FOs 30%	1	105 FOs 19%	0	0 FOs 0%	116	255 FOs 94%	0	16FOs 12%
1 - 10 %	21		8		0		53		0	
11 - 20 %	25		8		0		27		0	
21 - 30 %	42		11		0		24		0	
31 - 40 %	66		14		0		18		2	
41 - 50 %	89		11		0		6		6	
51 - 60 %	95		52		0		11		8	
61 - 70 %	138	794 FOs 70%	89	462 FOs 81%	3	50FOs 100%	7	15 FOs 6%	21	122FOs 88%
71 - 80 %	136		148		0		3		35	
81 - 90 %	119		60		11		2		34	
91 - 99 %	146		69		9		0		23	
100%	255		96		30		3		9	
TOTAL	1135		567		50		270		138	

**Fig.II Crop Wise Consolidated Status of Abiana Collection
(Rabi 2004 – Kharif 2011)**



Comments

- The performance of PIDA/FOs in term of Abiana recovery remained reasonably good in all AWBs during the first year of their inception (more than 85%). However the Abiana recovery substantially declined (55%) overtime in almost all the AWBS.
- Abiana recovery reduced from 88% to 60% during FOs first tenure in AWB LCC (East) and further reduced to 52% during Administrative period. Almost similar situation prevailed in LCC (West) where recovery continuously decreased from 90% to 64% during FO period. However due to substantial input and constant pursuance from PIDA Headquarter and response from field formation record abiana recovery improved 52% to 77% in LCC (E) and 73% in LCC (W) (comparative Administrator tenure).
- As an outcome of these initiatives aggregate recovery has improved to 68% and 74% in LCC East & West respectively. The recovery position during Administrator's tenure generally remained on low profile compared to the FO management.

- Three model FOs, established in Bahawalnagar Circle since 2000, and a lot of input made therein, but inspite of that Abiana recovery of these FOs also reduced from 95% to 83% during FO tenure and further declined to 75% during Administrative period. The aggregate recovery in Bahawalnagar Circle is 80%.
- The worse position is in CRBC, where recovery status is very disappointing and alarming. It declined from 34% to 4%. However due to constant drive, the recovery has increased from 4% to 14% and there are now positive indicators for further improvement.
- The best performer is Lower Jehlum Canal (LJC) Circle Sargodha wherein the recovery status of FOs remained above 90% during the entire period. The aggregate figure of recovery is 93% which is a good indicator for the success of this new Management shift from PID to PIDA.
- Besides this overall recovery picture, the categorical status of abiana recovery (FO wise and crop wise) indicates that 70% FOs in LCC (East), 81%FOs in LCC (West), 100% FOs in LJC, 6% FOs in CRBC, and 88% FOs in BWN, have abiana collection from 61-100% during their entire period of institutional reforms. The analysis further reveals that 60% FOs in LJC circle and about 20% FOs in LCC East & West have 100% recovery of abiana during their entire period.
- Likewise 30% FOs in LCC (East), 19% in LCC (West), 12% in BWN, and 94% in CRBC have Abiana recovery lesser than 60%. Thus the poorest is CRBC then LCC East, followed by West and then Bahawalnagar. LJC remained on top as best performing AWB (100%).

The above data analysis indicates that more pursuance and input both from PIDA formation, and FOs management is required in CRBC, LCC (East), LCC(West) and Bahawalnagar. LJC is performing very good and could be referred as success story of the institutional reform.

2.2 EQUITABLE DISTRIBUTION OF WATER

Besides abiana recovery the sustained equitable distribution of water is the prime responsibility of FOs management as well as the PIDA Administrators.

The historical record / data of channels both for FO management and Administrator / PID tenure (Irrigation Department) have been analyzed and represented as under ;

Table-5 Tail Status of Channels

AWB/ Canal Circle	Period	Total No. of running channel	Tail status of channels (Nos. & %)							
			Tail running as per Authorized	%	Short	%	Dry	%	Closed	%

LCC (East)	FO Tenure Kh: 2005 to Rabi 07-08	236	144	61	29	12	61	26	2	1
	Admn Tenure Kh: 2008 to Rabi: 10-11	236	167	71	22	9	42	18	5	2
LCC (West)	Pre IMT(PID) Kh: 2005 to Kh: 2007	176	143	81	22	13	10	6	1	1
	FO Tenure Rabi: 07-08 to Rabi 10-11	176	113	64	38	22	23	13	2	1
Total		824	567	69	111	13	136	15	10	1

Fig. III

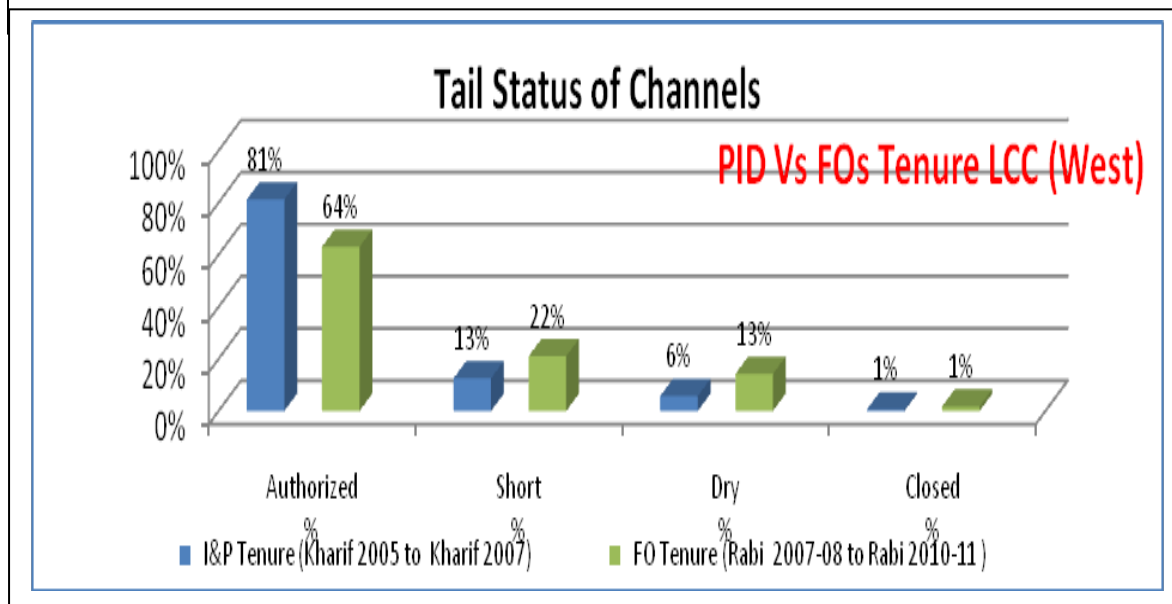
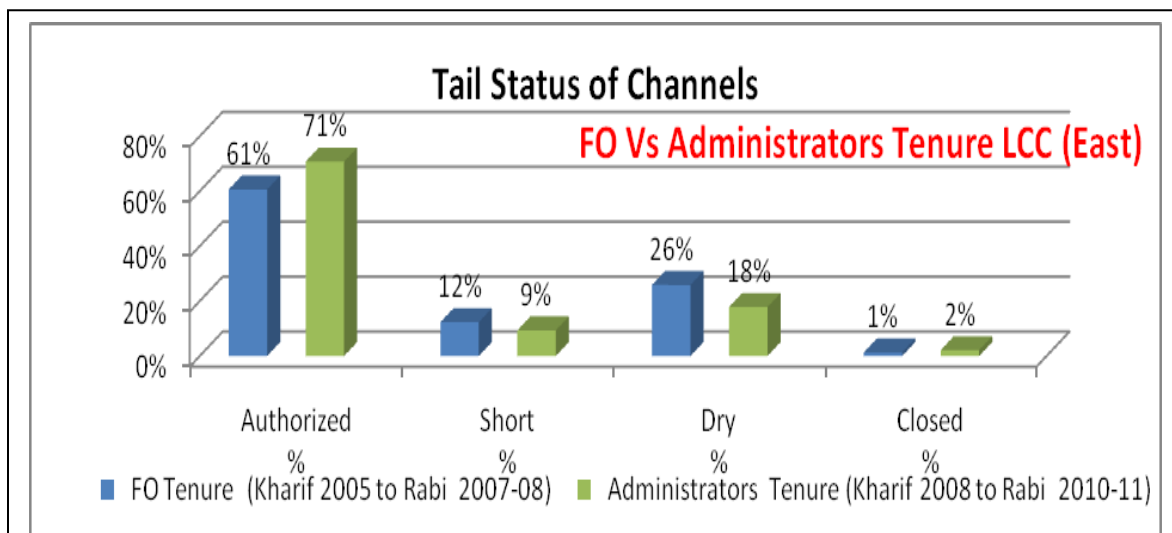


Table-6: Latest Tail Status of Channel (Rabi 2011-12)

AWB/ Canal Circle	Divisions	Total No. of running Channels	Tails Running as per Authorized		Tails Remained Short		Tails Remained Dry		Channels remain closed (> 80% of days during the period)	
			No. of Chan- nels	%	No. of Chan- nels	%	No. of Chan- nels	%	No. of Chan- nels	%
LCC(East)	Khanki	17	13	76	3	18	1	6	29 (NP)*	0
	Upper Gugera	57	31	54	7	12	14	25	5	9
	Lower Gugera	62	56	90	2	3	2	3	2	3
	Burala	70	52	74	6	9	10	14	2	3
	Total	206	152	74	18	9	27	13	9	4
LCC(West)	Faisalabad	54	36	67	10	19	8	15	2(NP)*	0
	Hafizabad	47	39	83	3	6	5	11	1(NP)*	0
	Jhang	72	50	69	8	11	13	18	1	1
	Total	173	125	72	21	12	26	15	1	1
Bahawalna gar	Fordwah	8	7	88	0	0	0	0	51(NP)	0
	Sadiqia	39	30	77	6	15	3	8	13(NP)	0
	Hakra	41	40	98	1	2	0	0	3 (NP)*	0
	Total	88	77	88	7	8	3	3	0	0
LJC Sargodha		16	16	100	0	0	0	0	0	0
CRBC		62	62	100	0	0	0	0	0	0
Grand Total		545	432	79	46	8	56	10	10	2

NP: Non-Perennial

Discussion and Analysis

- Table-5 above reveals that Administrator's performance in term of water distribution in channel is better than FO in LCC (E). Likewise the performance of irrigation department/ Pre-IMT in LCC (W) is better than 3 years FO tenure.

- 18% tails remained dry in LCC (E) during Administrator period compared with 26% in FO management tenure. Likewise 6% tails remained dry in LCC (W) during Pre-IMT compared with 13% during FOs management.
- The status of tails of channels in LCC East remained slightly better than LCC West (74% V/S 72%) during last crop season Rabi 2011-12.
- Table-6 above further indicates that FOs have not performed as good as either by PID or Administrators. There is need of continuous and effective Capacity Building of FOs, Public awareness and appropriate legal provision to take action against the culprits / involved in water theft.
- However effective steps / measures have been taken during last one year and situation has now improved. The status of Rabi 2011-12 reveals that the equitable water distribution and feeding of tails has improved up to 74% against 71% in LCC (E), 72% versus 64% in LCC (W). While 12% channels remained dry for most of time in LCC (W) and 9% in LCC (E). In Bahawalnagar 88% channels are feeding authorized tails and LJC is on the top (100%).
- The intra-divisional status of tails reveals that performance of Upper Gugera Division in LCC (East), Jhang and Faisalabad Divisions in LCC (West) and Sadiqia Division in Bahawalnagar remained lower than average performance of the respective AWB. The best performing divisions are Lower Gugera, and Hakra, and poorest are Upper Gugera, Faisalabad and Sadiqia Division.

2.3 DISPOSAL OF THEFT CASES

FOs management as well as PIDA Administrators have also been entrusted the role of controlling the water theft / unauthorized irrigation to ensure equitable distribution among the users / irrigators. The progress of water theft cases during last crop season (Rabi 2011-12) is depicted in following Table.

Table-7 Status of Water Theft Cases during Rabi 2011-12

Area Water Board	Divisions	Total cases detected	Cases Reported to Police	% Age	FIR Registered	% Age	No. of Arrests made	Nos. of Cases for which Tawaninitiated
LCC (East)	Khanki	321	215	67	64	30	33	215
	Upper Gugera	95	84	88	44	52	18	84
	Lower Gugera	21	13	62	9	69	12	13
	Burala	59	50	85	22	44	3	50
	Total	496	362	73	139	38	66	362
LCC (West)	Hafizabad	420	154	37	24	16	16	154
	Faisalabad	347	247	71	3	1	10	247
	Jhang	210	210	100	15	7	0	210

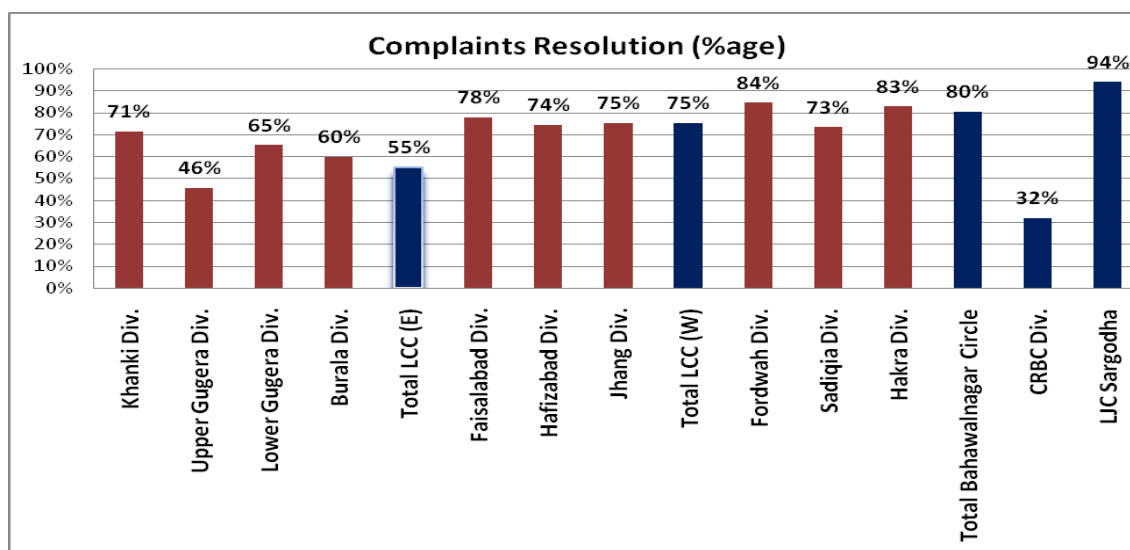
	Total	977	611	63	42	7	26	611
Bahawal-nagar	Fordwah	12	12	100	0	0	0	12
	Sadiqia	65	37	57	1	3	0	37
	Hakra	190	190	100	14	7	0	190
	Total	267	239	90	15	6	0	239
Derajat	CRBC	40	40	100	0	9	0	40
LJC	Sargodha	2	2	100	1	50	0	2
Grand Total		1782	1254	70%	197	16%	92	1254

Comments

- Table-7 reveals that the tendency of disposing of identified / detected water theft cases in LCC (East) is higher (73%) than of 63% in LCC (West). Due to initiation of action (cases reporting to police and levying special charges / tawan against the offenders) has resulted into improvement in water supply at tails.
- The achievement towards the registration of cases against the culprits is not encouraging which needs to be looked upon.
- Incidence of water theft cases reported to Police in Bahawalnagar and CRBC out of which only 6% and 9% got registered. Poor Police response in registration of FIR and arresting the culprits remained slow in all AWBs. This apathy resulted in emboldening other farmers for wrongdoings water theft and consequently hampered the functioning of AWB / FOs.
- The intra-Divisional status of water theft cases indicates that the police action for arrestation of culprits remained very poor in all AWBs particularly in Bahawalnagar and CRBC whereeven single arrest was not made. Similaris the situations in Jhang.
- The above data further reveals that Bahawalnagar and CRBC is the best performing where 90-100% detected cases reported to police followed by LCC East 73% then LCC West (63%). The overall achievement is encouraging (70%).

2.4 COMPLAINTS RESOLUTION

Fig. IV



- The progress of complaint resolution regarding water distribution / channels operation in LCC West is better (75%) than that of LCC East (55%).
- The intra divisional status of *complaint resolution* in AWBs LCC (E) & (W) reveals that the performance of Upper Gugera in East, Hafizabad in LCC (West) and Sadqia Division in Bahawalnagar is lower than the average performance of the respective AWB.
- The best performer is LJC and BWN having 94% and 80% progress respectively.
- The worst position is in CRBC, where overall complaints resolution remained only 32%.

3. ACHIEVEMENTS

1. Declining status of Abiana Collection has not only been controlled but now there is increasing trend in Abiana recovery in almost all the AWBs 53 to 77% in LCC (E), 64 to 73% in LCC(W) and 4 to 14% in CRBC.
2. Due to this paradigm shift from decrease to increase, additional resource generation of almost Rs. 200 Million has been made available which will be utilized for the up-keep and maintenance of irrigation infrastructure, leading to sustained equitable water distribution and improved tails.
3. Due to better Administrative control and enhanced public awareness / motivation there is substantial improvement in equitable water distribution and channels operation improved from 69% to 79%.
4. Substantial embezzled / pended amount got recovered from outgoing FO Presidents / Chairmen.
5. Two Financial Firms hired during 2008 but no audit could be conducted. The Audit of LCC East, LCC West and LJC Circle has now been managed and got conducted which was pended for the last 3 years.
6. All the stakeholders have been brought on board. Meetings also held with the public representatives and civil Authorities seeking their assistance to improve the Abiana as well as water distribution.

4. CONSTRAINTS

1. Lack of legal provision and back up support to proceed against the defaulters/ delinquents. Resultantly the field officers are currently handicapped to catch hold of culprits.
2. Interruption in FO tenures and prolonged Administrative period which leads to inconsistency and dis-continuity in the reforms process.

3. Neither there is effective internal audit system in vogue at FO Level nor post-audit has been conducted for years long. This lack of financial management has led to irregularities and poor financial control.
4. Dis-continuity in policies which has negatively contributed towards the confidence building of FOs as well as at AWB level. Clear and well defined sustainable policies need to be formulated and strictly adhered to.
5. Lack of coordination and delayed action by Police Department particularly at the FO level. The cases referred to are not mostly registered and no arrest is made. This lack of coordination has encouraged the in-equitable distribution and theft of water.
6. 6% Incentive only for Lambardar (Abiana Collector) and there is no incentive for FO Management Committee as well as Khal Panchayat Members.

5. WAY FORWARD

1. Appropriate provision in the rules for proceeding against the defaulters involved in inequitable water distribution and theft of water.
2. Continuity in the reform process, the Administrators tenure may be maintained to the minimum extent and election of FOs should be completed as per laid down procedure when the tenure of on-going FOs is completed.
3. Transparency in the fiscal and financial management. Capacity building of FOs at AWB and FO level.
4. Conduction of internal audit of FOs at AWB level as well as the yearly external audit through the External Auditors.
5. Strict vigilance/surveillance is required in abiana collection and its disbursement.
6. Good coordination and cordial relationship between the PIDA and PID formation. The irrigation officers have been associated under the rules in the functioning of FO. Their professional competence and year's long experience needs to be availed of.
7. Effective role of Police Department is inevitable to proceed against those involved either in the water theft or defaulting in abiana recovery.

8. Filling of vacant posts particularly at AWB level and uniform criteria for the recruitment of *staff at various level.*