

# Maharashtra Water Resources Regulatory Authority, Mumbai

## Evaluation of Determination, Enforcement, Regulation and Monitoring of Entitlement in Pilot Projects for Kharif, Rabi & Hot Weather Seasons 2011-12

**1.0** In the year 2006-07, the concept of Entitlement was initiated with 5 pilot projects from the Krishna basin as per the provision in Section 11(a) of MWRRA Act, 2005. The Entitlement Programme has been extended over the years. The number of projects covered under the Programme is:-

Year	Addition during the year						Total No. of projects
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	
2006-07	5						5
2007-08		15					20
2008-09			57				77
2009-10				52			129
2010-11					100		229
2011-12						17	246

During the year 2011-12 the number of Water User Associations (WUAs) covered under the Programme is 818.

**1.1** Categorywise and river basinwise abstract of the 246 pilot projects included under the Entitlement Programme for 2011-12 is:-

Sr. No.	Category of Project	River Basin					WUAs under Entitlement
		Godavari	Krishna	Tapi	Konkan	Total	
1	Major	8	2	1	1	12	434
2	Medium	9	2	2	0	13	106
3	Minor	113	50	32	26	221	278
	Total	130	54	35	27	246	818

**1.2** Of the 246 pilot projects taken up under the Entitlement Programme, 24 projects are not from the Maharashtra Water Sector

Improvement Project (MWSIP). The other 222 projects are from the MWSIP.

The year wise break-up of pilot projects under MWSIP taken up for the monitoring and implementation of Entitlement Programme is-

Sr. No.	Irrigation Year	Project Category						Total	
		Major		Medium		Minor		Projects	WUAs
		Projects	WUAs	Projects	WUAs	Projects	WUAs		
1	2006-07	2	20	1	8	2	2	5	30
2	2007-08	4	25	4	41	11	14	19	80
3	2008-09	5	28	8	49	40	50	53	127
4	2009-10	5	28	10	53	90	105	105	186
5	2010-11	9	200	11	68	185	233	205	501
6	2011-12	9	431	11	103	202	258	222	792

### 1.3 Yearwise break-up of pilot projects outside MWSIP is -

Sr. No.	Irrigation Year	Project Category						Total	
		Major		Medium		Minor		Projects	WUAs
		Projects	WUAs	Projects	WUAs	Projects	WUAs		
1	2006-07	0	0	0	0	0	0	0	0
2	2007-08	1	1	0	0	0	0	1	1
3	2008-09	3	3	2	3	19	20	24	26
4	2009-10	3	3	2	3	19	20	24	26
5	2010-11	3	3	2	3	19	20	24	26
6	2011-12	3	3	2	3	19	20	24	26

1.4 Annexure I give list of all the 246 pilot projects giving total number of WUAs of the projects vis-a-vis number of WUAs included in the Entitlement Programme, corresponding area of WUAs under Entitlement, total number of beneficiaries covered under the Entitlement Programme.

1.5 As per provision in clause 11(g) of MWRRA Act, 2005 (Maharashtra Act No. XVIII of 2005) function of MWRRA is to lay down the criteria and monitor the issuance of Entitlement whereas as per provisions in clause 11(g) (iii) bulk water Entitlements for

irrigation shall be issued by River Basin Agency to the Water Users' Associations.

## **2.0 Deliverance of Entitlements during 2011-12**

### **2.1 Kharif Entitlement**

**2.1.1** During irrigation year 2011-12, 17 Kharif-oriented projects are included in programme. As per guidelines given in Government Resolution no.(Marathi) Misc/10.00/(19/2000)/IM(P), dated 07/03/2001 & Technical Manual prepared by Authority, the Kharif programme is to be started only after 33 % storage is achieved. During irrigation year 2011-12, the storage condition during July for nearly all Kharif-oriented projects was quite less. Hence the Applicable Water Use Entitlement could not be computed for all these Kharif-oriented projects. Applicable Water Use Entitlement for few projects was checked and communicated to field officers in July, 2012. The details are as below :

<b>Project</b>	<b>% Storage attained in July</b>	<b>Applicable Entitlement (TCM)</b>
Itoli	34.00	202.80
Salegaon	60.55	279.00
Badbadya	45.70	963.60

**N.B.:** Actual utilization in Kharif is commenced in September / October after the attainment of storage beyond 75%

For other projects, Kharif utilization is done by field officers at their own level.

**2.1.2** Annexure II (A) gives details of those 17 Kharif-oriented projects where Entitlement Programme is implemented in Kharif season 2011-12. It is observed that field officers have gone in for Kharif rotations only after the storage is more than 33%.

## **2.2 Rabi Entitlement**

**2.2.1** Applicable Unit Water Use Entitlements for Rabi season, on the basis of storage as on 15/10 /2011 or 15/11/2012 were checked and communicated to field officers of all 246 projects under consideration, because the Entitlement programme is being implemented on pilot basis. However, as per provisions under MWRRA Act, the Entitlement is to be issued by representative (field officer) of RBA. In future Entitlement for irrigation will have to be issued by representative (field officer) of RBA on similar lines on the basis of Criteria evolved by MWRRA. It is, therefore, suggested that field officers responsible for issuance of entitlements may undertake necessary step right now so as to achieve the requisite competence.

**2.2.2** Annexure II (B) gives details of all the 246 projects where Entitlement Programme is implemented in Rabi season of the year 2010-11. The details such as number of WUAs actually covered under the Entitlement Programme, their corresponding area, corresponding applicable Entitlement in Thousand Cubic Metres (TCM) vis-a-vis actual quantity availed in the Rabi season and corresponding area irrigated in Rabi & number of beneficiaries are tabulated in this Annexure.

## **2.3 Hot Weather Entitlement**

**2.3.1** After completion of irrigation in the Rabi season during the year 2011-12 on these 161 pilot projects, Hot Weather irrigation is done on 32 pilot projects as water was available and also there was demand from WUAs for the same.

**2.3.2** In Annexure II (C) entitlement scenario of such projects is presented. In addition to these projects, hot weather rotations as a part of continuous Kokan-Hangam (i.e. Rabi plus hot weather starting from December & lasting till April) for paddy irrigation are given for projects in Konkan region. Few projects from Vidarbha region for which season starts from January and lasts till May are also covered. These projects are already included in Rabi Entitlement Programme.

### **3.0 Performance Evaluation of Entitlement Programme (2011-12)**

#### **3.1 Kharif Entitlements**

##### **3.1.1 Percentage of Area Irrigated**

An abstract of % of area irrigated during Kharif of 2011-12 is given below.

<b>Sr. No.</b>	<b>Range of % of actual irrigated area to the delineated area</b>	<b>Number of projects</b>	<b>Cumulative number of projects</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>1</b>	100	0	0
<b>2</b>	90 to < 100	2	2
<b>3</b>	80 to < 90	5	7
<b>4</b>	60 to < 80	5	12
<b>5</b>	50 to < 60	2	14
<b>6</b>	30 to < 50	2	16
<b>7</b>	10 to < 30	1	17

##### **3.1.2 Percentage of farmers accrued benefits of Kharif Irrigation**

An abstract % of farmers who opted for Kharif irrigation to total number of farmers is given below:-

<b>Sr. No.</b>	<b>Range of % of farmers taken up Kharif irrigation to total number of farmers</b>	<b>Number of projects</b>	<b>Cumulative number of projects</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>1</b>	100	5	5
<b>2</b>	90 to < 100	6	11
<b>3</b>	80 to < 90	1	12

4	60 to < 80	2	14
5	50 to < 60	1	15
6	30 to < 50	2	17
7	10 to < 30	0	17
8	> 0 to < 10	0	17

The majority of WUAs carried out Kharif irrigation. Nevertheless it is seen that protective irrigation is done by majority of farmers of the WUAs depending upon the rains.

## 3.2 Rabi Entitlements

### 3.2.1 Percentage of Entitlement Delivered

Applicable Entitlement for all 246 pilot projects is checked and communicated to field officers. The basis is the live storage as on 15 October/ 15 November 2011. The percentage of Entitlement delivered in Rabi (TCM) with respect to the Applicable Entitlement (TCM), in various ranges during the Rabi season is given below.

#### % of Entitlement delivered in Rabi season

Serial Number	Range of % of Entitlement delivered in Rabi season w.r.t. the Applicable Entitlement	Number of projects	Cumulative number of projects
1	2	3	4
1	300 & above	1	1
2	250 to < 300	0	1
3	200 to < 250	2	3
4	160 to < 200	0	3
5	150 to < 160	6	9
6	125 to < 150	12	21
7	100 to < 125	17	38
8	90 to < 100	19	57
9	80 to < 90	18	75
10	70 to < 80	17	92
11	60 to < 70	11	103
12	50 to < 60	17	120
13	40 to < 50	13	133
14	30 to < 40	9	142
15	20 to < 30	10	152

Serial Number	Range of % of Entitlement delivered in Rabi season w.r.t. the Applicable Entitlement	Number of projects	Cumulative number of projects
16	10 to < 20	3	155
17	> 0 to < 10	6	161
18	0	84	245
19	Project deleted	1	246

One project viz. Navegaon Bandh is deleted.

The 'zero' deliverance of entitlement in 84 projects is attributed to the reasons indicated in the following table -

### Reasons for not availing Entitlement on 84 projects

Reasons for not availing Entitlement	Number of Projects	Names of projects	reference serial number
A) No live storage	26		
		1) Hiware	12
		2) Chincholi	16
		3)Charthana	60
		4)Satewadi	81
		5)Dighanchi	83
		6)Lingnur	85
		7)Padvalkarwadi	89
		8)Telhara	101
		9)Bhalwani	113
		10)Tikhhol	114
		11)Mayani	142
		12)Shegaon	144
		13)Kalwande	163
		14)Tithavali	165
		15)Nileli	167
		16)Vyaghra	190
		17)Paratwadi	209
		18)Ankhoda	226
		19)Gumdoh	230
		20) Hari	231
		21) Pangadi	234
		22) Dodmazari	236
		23)Amagaon	237
		24)Kusarla	242
		25)Mudza	243
		26)Yelgur	246

Reasons for not availing Entitlement	Number of Projects	Names of projects	reference serial number
B) Very low live storage resulting into insufficient depth for crop growth	15		
		1) Banganga	14
		2)Kankatrewadi	30
		3)Shiraswadi	31
		4)Dhakani	32
		5)Kuchi	84
		6)Kasarbalkunda	111
		7) Hingangaon	141
		8)Pingali	143
		9)Rampur	148
		10)KhadakOzar	216
		11)Aktiola	223
		12)Khumari	224
		13)Sondo	229
		14)Badbadya	235
15) Dhanora	245		
C)Water saved for HW , but HW irrigation also not exercised	1		
		Chulband	28
D) Water saved for HW	3		
		1)Pipariya	225
		2)Salegaon	232
		3)Badadha Tukumba	238
E) Canal system not in proper condition /canal rehabilitation work in progress/DSRP works in progress / incomplete rehabilitation works	13		
		1)Deocope	42
		2)Shewaga	68
		3) Raitale	91
		4)Awasare	149
		5)Unhere	157
		6)Usagaon	158
		7)Usran	159
		8)Varandha	161
		9)Shirwali	162
		10)Vhel	164
		11)Harkul	169
		12) Velhale	215
13) Khekada	222		
F)Water reserved for Drinking purposes	6		
		1)Anjani	15
		2)Atpadi	35
		3)Sidhanath	36
		4)Dudhebhavi	37



Reasons for not availing Entitlement	Number of Projects	Names of projects	reference serial number
		5)Belgaon	61
		6)Kadegaon	145
G)No flow irrigation done (water is utilized for lift irrigation only)	9		
		1)Mangi	3
		2) Hanjagi	86
		3)Shirvalwadi	87
		4)Alegaon Paga	137
		5)Jamburde	152
		6)Kharade	153
		7)Thakurwadi	156
		8)Dharur	189
		9)Wadali	211
H) Irrigation through other sources such as well irrigation etc.	3		
		1)Badarakha	69
		2)Ghotala	109
		3)Tintraj	212
I) No demand from WUAs	7		
		1)Rengepar	78
		2)Pathari	88
		3)Neoli	110
		4)Lagam	228
		5)Janla	241
		6)Rajgatta	244
		7)Rudrapur	245
J)Canal system damaged due to flood / Repairs deferred / pending	1		
		1) Madkhol	171
<b>Total number of projects where Rabi irrigation is not done</b>	<b>84</b>		

### 3.2.2 Percentage of area irrigated

Annexure II (B) gives the delineated area of WUAs under the entitlement, vis-a-vis actual area irrigated and percentage of area irrigated to the delineated area. An abstract of % of area irrigated during Rabi of 2011-12 is given below.

Sr. No.	Range of % of actual irrigated area to the delineated area	Number of projects	Cumulative number of projects
1	2	3	4
1	80 to 100	5	5
2	60 to < 80	8	13
3	50 to < 60	7	20
4	30 to < 50	47	67
5	10 to < 30	69	136
6	> 0 to < 10	25	161
7	0	84	245
8	Project deleted	1	246

**3.2.3** Evaluation of performance is made on the basis of % water delivered, % area irrigated and % farmers taken up irrigation.

Annexure II (B) presents projectwise break up of:

- i) % water delivered as against the total applicable entitlement due
- ii) % area irrigated as against the total delineated area of WUA
- iii) % farmers taken up irrigation (i.e. who received entitlement) as against the total number of members of WUA.

The following yardsticks of performance indicator are adopted to judge the performance of the entitlement deliverance on the Pilot Projects. Especially the performance during Rabi 2011-12 is weighed against the following yardsticks :-

- a) % water delivered (80-120 %)
- b) % area irrigated (more than 80 %)
- c) % farmers taken up irrigation (more than 85 %)

In the following table the projects which exhibited remarkable / successful / satisfactory / good performance are tabulated.

Sr. No.	Sr. No. As per Annexure - I	Project	District	Fulfillment of yardstick		
				a)	b)	c)
1	20	Dongargaon	Wardha	√	√	√
2	116	Ramshej	Nashik	√	√	√
3	77	Kannamwargram	Wardha	√		√
4	38	Chare	Solapur	√		√
5	8	Lower Wunna	Nagpur			√
6	123	Urkudapar	Nagpur			√
7	41	Walwad	Solapur			√
8	13	Nandwal	Satara	√		
9	75	Umri	Wardha	√		
10	123	Urkudapar	Nagpur	√		
11	50	Dastapur	Amaravati	√		
12	124	Suwardhara	Nagpur	√		
13	70	Galan	Jalgaon	√		
14	125	Zhilpa	Nagpur	√		
15	73	Ambazari	Nagpur	√		

The first 2 cases are of remarkable performance; the second 2 cases are of successful performance; the further 3 cases are of satisfactory performance and last 8 cases are of good performance as far as entitlement programme of Rabi 2011-13 is concerned.

### 3.3 Hot Weather Entitlements

Hot Weather Entitlement Programme was implemented on 32 pilot projects. Out of 84 projects where no entitlement is availed in Rabi, 4 projects are such that WUAs have deferred the Rabi Entitlement so as to avail the Entitlement in Hot Weather season. These projects are Chulband, Pipariya, Salegaon & Badadha Tukumba. However due to rotation pattern under the Chulband project, two WUAs which are included in Entitlement programme could not exercise HW programme.

#### 3.3.1 Percentage Entitlement delivered

On the basis of storages as on (01/03/2012) / (01/04/2012) field officers computed the Applicable Entitlement for Hot Weather. An abstract of entitlement delivered in various ranges is given below.

### % of Entitlement delivered

<b>Sr. No</b>	<b>Range of % of Entitlement delivered in Hot Weather</b>	<b>Number of projects</b>	<b>Cumulative number of projects</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1	above 150	1	1
2	125 to < 150	1	2
3	100 to < 125	4	6
4	90 to < 100	4	10
5	80 to < 90	0	10
6	70 to < 80	1	11
7	60 to < 70	4	15
8	50 to < 60	1	16
9	40 to < 50	4	20
10	30 to < 40	3	23
11	20 to < 30	4	27
12	10 to < 20	2	29
13	> 0 to < 10	3	32

### 3.3.2 Percentage Area Irrigated

An abstract of percentage area irrigated during hot weather is given below:

#### Percentage area irrigated during hot weather

<b>Sr. No</b>	<b>Range of % of actual area irrigated in HW to the delineated area</b>	<b>Number of pilot projects</b>	<b>cumulative number of projects</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1	70 to < 80	2	2
2	60 to < 70	0	2
3	50 to < 60	0	2
4	40 to < 50	1	3
5	30 to < 40	0	3
6	20 to < 30	2	5
7	10 to < 20	10	15
8	> 0 to < 10	17	32

## 4.0 Inspection by Regulators

**4.1** Annexures II (A), II (B) & II (C) give project wise number of visits during the rotations by the appointed regulators. As per the Technical Manual brought out by the Authority in 2007, a

regulator has to make at least 3 random checks in a rotation period of 15 days or so. It is seen that on most of the projects, regulators could pay only 1 visit per rotation.

#### **4.2 Impact of Regulators:**

Enforcement of entitlements is one of the functions of MWRRA devolved by the Act. In order to monitor the enforcement of entitlements, MWRRA appoints regulators on the recommendation of the Water Resources Department. They are specially trained for the task they are intended to perform.

The Entitlement Programme implemented on pilot irrigation projects in the State during the period 2007-08 to 2011-12 has positively testified the performance of regulators which is clear from the following :-

- (i) There is a provision in the Powers & Responsibilities of Regulators to issue pink slips, so that deficiency in operations could be rectified. Pink slip is issued by the Regulator to the Department's staff when the quantum supplied in any rotation is short by 15-20% of the agreed quantum. It is required to make good the shortfall in subsequent rotation.

Critical remarks in respect of deficient installation of measuring devices, improper field condition of canal system have been reported by regulators. This helped speed up undertaking corrective / remedial measures.

However, pink slips had been issued by the regulator in case of 1) Kalamnuri 2) Ghoddhari and 3) Bothi projects (all from Hingoli district) during rabi of 2011-12.

- (ii) Regulators have cross checked the quantities supplied by the field officers and have reported the same.

- (iii) Regulators have reported the requirements and requests of the WUAs to field officers and accordingly the action is taken by the field officers to set the matters right.
- (iv) Since the regulators are appointed by MWRRA and are to report directly to it, they have worked as representatives of MWRRA.

Most of the regulators have visited at least once during every rotation and acted as an interface between the WUAs and the Department's officials (RBAs). In few cases, regulators have not visited site during rotations nor have exercised any check on the delivery during rotation. It is suggested that concerned superior field officers should adopt necessary measures so as to ensure that regulators visit the concerned WUA area at least once during the rotation by providing transportation facility if area is in interior.

## 5.0 Workshop on Operationalising Water Entitlement

The objective of organizing workshop on Operationalising Water Entitlement is to have an interaction among service provider, managerial staff of WUAs and regulators (functioning on behalf of Authority). Such workshops provide an opportunity to present success stories of WUAs which have benefitted by way of implementation of Entitlement Programme. Other WUAs get inspiration through this for performance enhancement so that over all water use efficiency is further increased.

Regional workshops for the year 2011-12 had been organised on the dates indicated in the following:-

<b>Region</b>	<b>Date</b>	<b>Region</b>	<b>Date</b>
1) Amaravati	16/9/2011	4) Aurangabad	22/9/2011
2) Nagpur	17/9/2011	5) Pune	23/9/2011
3) Nashik	21/9/2011	6) Ratnagiri	25/11/2011

Regulators were acquainted with their functions and duties as far as delivering entitlements was concerned. They are trained through such workshops as to the modus operandi of enforcement of entitlements.

## **6.0 Evaluation of Entitlement Programme (2011-12) in Nutshell**

The total number of projects included in Entitlement Programme is 246. Out of these 246 projects 222 projects are MWSIP projects & out of 1351 WUAs under these 222 projects 792 WUAs are included in Entitlement programme MWRRA has planned to focus only on MWSIP projects for inclusion in Entitlement programme, as such Non-MWSIP projects are restricted to 24 projects. Out of 230 WUAs under these Non-MWSIP projects 26 WUAs are included in Entitlement Programme. From irrigation year 2010-11, no new Non-MWSIP project is included in the Programme. Thus for total number of 1581 WUAs under these 246 pilot projects, 818 WUAs have been included under Entitlement programme 2011-12.

Total delineated area of 818 WUAs included so far in Entitlement programme is 344131 ha. Actual area which received entitlement in Rabi 2011-12 is 87267 ha. The actual area irrigated in HW 2012 is 30548 ha.

In pursuance of the provisions in MWRRA Act, 2005, the Entitlement Programme has been introduced in the State. Determination, Enforcement, Regulation of Entitlement is being implemented from irrigation year 2006-07. At this stage, some works of rehabilitation of distribution system and also the repairs and the rehabilitation works of dam/dam components as proposed by DSRP are still under progress. The concept of issuance & enforcement of Entitlements on volumetric basis with legal backing being newly introduced it will take some time to gain momentum for these reforms to get adopted well.

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