

# **Technical Manual**

## **Determining, Regulating, and Enforcing Water Entitlements in Irrigation Projects of Maharashtra**



**Maharashtra Water Resources Regulatory Authority**

**Mumbai**

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### **About MWRRA**

Maharashtra Water Resources Regulatory Authority (MWRRA) was set up on 8 June 2005 under an act of the Government of Maharashtra (MWRRA Act, 2005), to regulate the water resources within the State of Maharashtra, facilitate and ensure judicious, equitable and sustainable management, allocation and utilisation of water resources, fix the rates for use of water for agriculture, industrial, drinking and other purposes and matters connected therewith or incidental.

The powers, duties, and functions of the Authority consist of:

- ▶ determining of criteria for distribution of entitlements
- ▶ establishing a system of enforcing and monitoring of the entitlements and its regulation.

**Technical Manual for Determining, Regulating, and Enforcing Water Entitlements in  
Irrigation Projects of Maharashtra  
(Revised Edition, May 2015)**

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## **PREAMBLE**

The MWRRA Act, 2005 had initially (before the April 2011 Amendment) entrusted the Authority, through clause 11(a), with the power to determine the distribution of Water Entitlements for various categories of use and of equitable distribution within each category of use. Moreover, the Authority was required to work according to the framework of the State Water Policy announced in July 2003. The Authority was also entrusted with the regulation, enforcement and monitoring of the Entitlements.

Accordingly the Authority had brought out a “Technical Manual for Fixing, Regulating, and Enforcing the Entitlements in Irrigation Projects” in January 2007. The purpose of the manual was to provide guidance to the project authorities in determining the Entitlements for each category of use viz. irrigation, domestic (including drinking water) and industrial water supply, and keep a record of the delivery of the irrigation Entitlements, for each season and rotation. The Manual also prescribed the regulatory mechanism, to verify delivery of Entitlements.

This revised version of the manual contains updated information in light of the revision of the State Water Policy (2011) and amendments in the MWRRA Act, as also on the basis of experience gained during the implementation of the Entitlement Programme over the years. It is hoped that this manual will be of use to technical staff and office bearers of the Water Users’ Associations, in better understanding of the procedure involved in the determination and the effective implementation of the Entitlement Programme leading to enhancement of the overall performance of the irrigation projects in the State.

**Ravi B. Budhiraja**

**Chairman**



## 1. NEED FOR REVISION OF THE MANUAL

### 1.1 Background

The concept of Entitlement was adopted initially on five pilot irrigation projects during 2006-07. The Entitlement Programme has since been upscaled to 256 irrigation projects. The number of WUAs covered initially under the Programme was 30, which was increased to 1368 by 2013-14.

The State Water Policy was initially brought out in July 2003, while the MWRRA Act was enacted in 2005. Subsequently, the State Water Policy was modified in May 2011 by bringing about a change in the priority of water use. The MWRRA Act was also amended in April 2011. The present revised version of the Manual is prepared in view of these changes, and the feedback received from various 'Entitlement workshops' held so far.

The present Manual briefly discusses the key highlights of the outcome of various regional workshops, as also changes effected due to amendments in the MWRRA Act 2005, and revision in the State Water Policy. The step by step process in determination of unit water entitlement for kharif, rabi, and hot weather seasons is given. Various proforma have been evolved for compiling and reporting of the requisite information by the field staff and data at the beginning and end of the irrigation season.

### 1.2 Revision of the State Water Policy

A comparison of the water use priority as per the Maharashtra State Water Policy (2003) and as revised in 2011 is as follows:

	<b>SWP (2003)</b>	<b>Revised SWP(2011)</b>
a	Domestic use for drinking, cooling, hygiene and sanitation needs including livestock	Domestic use for drinking
b	Industrial, commercial and agro-based industrial use	Agricultural (irrigation water) use
c	Agriculture and hydropower	Industrial, commercial use and agro based industry use, hydro power
d	Environmental and recreation use	Environmental and recreation use
e	All other uses.	All other uses.

### 1.3 Amendment to the MWRRA Act

The MWRRA Act 2005 was amended in 2011 and the relevant amendments made are shown below:

	<b>MWRRA Act (2005)</b>		<b>MWRRA Act (Amendment &amp; Continuance 2011)</b>
11 (a)	To determine the distribution of Entitlements for various Categories of Use and the equitable distribution of Entitlements of water within each Category of Use on such terms and conditions as may be prescribed;		To determine the criteria for the distribution of Entitlements by the RBAs, within each Category of Use, on such terms and conditions as may be prescribed, after sectoral allocation is made under Section 16A. Sectoral allocation defined in the Act as “the allocation made in a water resources project by the State Govt. to the various user categories.”
11(n)	To establish regulatory system for the water resources of the State, including surface and sub-surface waters, to regulate the use of these waters, apportion the Entitlement to the use of the water of the State between water using categories.		Deleted
11(o)	To establish a system of enforcement, monitoring and measurement of the Entitlements for the use of water that will ensure that the actual use of water, both in quantity and type of use are in compliance with the Entitlements as issued by the Authority;		To establish a system of enforcement of the Entitlements issued by the concerned River Basin Agency to various Categories of Use and its regulation, through measurement and monitoring, with a view to ensure that the actual use of water, both in quantity and type of use, are in compliance with the Entitlements issued.
		16 A	(1) Notwithstanding anything contained in section 11 or any other provisions of this Act or in any other law for the time being in force, the State Government shall determine the sectoral allocation.
		31 A	Notwithstanding anything contained in this Act or any other law for the time being in force, the term “Entitlement” shall apply only to such areas where compliance of

	<b>MWRRA Act (2005)</b>		<b>MWRRA Act (Amendment &amp; Continuance 2011)</b>
			all relevant provisions including delineation under the Maharashtra Management of Irrigation Systems by Farmers Act, 2005 is made.
		31 B	Notwithstanding anything contained in this Act or in any other law for the time being in force, or in any order, judgment or decree of any court, tribunal or authority, any person or Water User Entity to whom a permission, allocation, sanction, authorization or Entitlement of water has been granted by the High Power Committee or the River Basin Agency or the State Government, prior to the 17 <sup>th</sup> September 2010, being the date of commencement of section 1 of the Maharashtra Water Resources Regulatory Authority (Amendment and Continuance) Act, 2011, shall be deemed to have been granted, in accordance with the provisions of this Act and accordingly the same shall continue and no such person or Water User Entity shall be required to obtain fresh permission, allocation, sanction, authorization or Entitlement to draw water.

#### **1.4 Implications of the Revision/ Amendments**

1. As per the definition of sectoral allocation given in the Amended Act of 2011 and provision under 16 A, the sectoral allocation to various categories of use is to be decided by the State Govt. From this it is clear that the impact of change in priority of water use as modified in the year 2011 has to be taken into account by the Govt while deciding the sectoral allocation. The MWRRA has now no role in determining the sectoral allocation. The MWRRA's role has been limited to deciding the criteria for distribution of entitlements after sectoral allocation is made by the Government.

2. Section 31A of the Amended Act pertains to the application of Entitlement i.e. coupling with all relevant provisions including delineation under the MMISF Act, 2005. From this, it is clear that delineation of the command area of the project under the MMISF Act is a prerequisite for implementation of irrigation entitlement.
3. As per the provision under section 31B of the Amended Act 2011, all the permissions granted to non-irrigation users prior to 17 September 2010 are protected. However, sectoral allocation made by the Government as per provision of the Amended Act is likely to be reviewed at such intervals of not less than three years.

## 2. DEFINITIONS OF THE TERMS USED

The following definitions will apply to the contents of the manual.

1)	Act	Maharashtra Water Resources Regulatory Authority Act 2005 as amended in April, 2011
2)	Authority	Maharashtra Water Resources Regulatory Authority.
3)	Entitlement Programme	The programme of determining, regulating, enforcing and monitoring of irrigation entitlements.
4)	Guidelines	Procedure for Regulation & Enforcement of Entitlements – brought out by Authority in October, 2007 and as revised from time to time.
5)	Hot weather irrigation season	Period from 1 <sup>st</sup> March to 30 <sup>th</sup> June every year for Western Maharashtra / North Maharashtra and Marathwada. Period from 1 <sup>st</sup> April to 30 <sup>th</sup> June every year for Vidarbha and Konkan.
6)	Off-take point	The point of off-take of water from an irrigation system
7)	Influence area	The project area over which several types of favourable and unfavourable effects are observed because of presence of reservoir and the irrigation system.
8)	Irrigation Year	the period from 1 <sup>st</sup> July to 30 <sup>th</sup> June of every year
9)	Kharif irrigation season	The period from 1st July to 14th October every year for Western Maharashtra / North Maharashtra and Marathwada

		Period from 1 <sup>st</sup> July to 14 <sup>th</sup> November every year for Vidarbha and Konkan.
10)	Primary Dispute Resolution Officer (PDRO)	Any officer notified by the State Government to resolve dispute about issuance or delivery of Entitlements for any project.
11)	Project Authority	The officers under the Water Resources Department to whom a project is assigned for management
12)	Rabi irrigation season	period from 15th October to 28/ 29 February every year for Western Maharashtra / North Maharashtra and Marathwada Period from 15th November to the 31 <sup>st</sup> March every year for Vidarbha and Konkan.
13)	Regulated releases	Any release from the storage system made by the project authority excluding releases made to pass flood waters so as to secure the safety of the structure in case of emergency or for domestic purposes in periods of scarcity.
14)	Regulator	A person identified / appointed by the MWRRA to monitor and verify the implementation of Entitlement.
15)	Water User	Any individual or body corporate or an association using surface or groundwater.

**Note:** Words and expressions used in this Manual, but not defined herein, shall have their respective meanings as assigned to them in the Maharashtra Act XVIII of 2005 (MWRRA Act), Maharashtra Act XXIII of 2005 (MMISF Act).

### **3. ENTITLEMENT: PRINCIPLE AND PROCEDURE**

#### **3.1 Principle**

Entitlement is defined as any authorization by any River Basin Agency to use water as per provisions of the Act. The power to determine sectoral allocation is vested in the State Government as per the amended MWRRA Act, 2011. The MWRRA is required to determine the criteria for distribution of entitlements within each category of use. Actual issuance and delivery of entitlement for irrigation is subject to the compliance of all the relevant provisions of the MMISF Act, 2005. Ensuring equity among all beneficiaries within each category of use shall be the guiding principle in determination of Entitlement. As per Section 12(6) of MWRRA Act, the Authority shall fix the Quota at project level, sub-basin level, on the basis of the following principles:-

(a) for equitable distribution of water in the command area of the project, every land holder shall be given a Quota; and, (b) the Quota shall be fixed on the basis of the land in the command area; provided that, during the water scarcity period each landholder shall, as far as possible, be given Quota adequate to irrigate at least one acre of land.

The procedure for calculating entitlement in agricultural irrigation is given in the MMISF Act, 2005. Only the Water User Associations (WUAs) are authorized to receive and utilize an irrigation entitlement. Hence, formation of WUA is a pre-requisite for eligibility of the irrigation entitlement.

### 3.2 Terms Used

- **Entitlement** means any authorization by any River Basin Agency to use the water for various purposes.
- **Aggregate Bulk Water Entitlement** means an aggregate of Entitlements issued to a group or association of Water User Entities.
- **Bulk Water Entitlement** shall mean the volumetric entitlement to a share of the surface water resources of a project for a specific category or categories of use, and deliverable within a specific period of time as specifically provided in the order granting the Entitlement.
- **Prescribed Unit Water Use Entitlement** in relation to a reservoir supported canal system means the total volume of water that is available in an irrigation year or a season per hectare of culturable command area (CCA) arrived at after considering prior sanctions for non-irrigation purposes and all the losses and gains from the canal system in a normal year as per project planning.
- **Sanctioned Water Use Entitlement** in relation to an agreement with WUA on a reservoir based canal system means the total volume of water guaranteed to be supplied to the WUA in different seasons in a normal year as per project planning.
- **Applicable Water Entitlement (Water Quota)** in relation to a reservoir supported canal system means the total volume of water guaranteed to be supplied to a WUA at the agreed point of supply.

**Water Quota** means a volumetric quantity of water made available to an entitlement holder. For example, if the designed utilization of water as per project planning is 100 units and the allocation made to irrigation, domestic and industrial water supply is respectively 75, 15 and 10, then 100 is the aggregate bulk water entitlement and 75, 15, 10 are the bulk water entitlements to the 3 categories of uses. This is in fact sectoral allocation as defined in the Amended Act.

Of the bulk water entitlement to irrigation (i.e. sectoral allocation for irrigation), further seasonwise allocation could be 15 units to kharif (bulk entitlement for kharif), 50 units to rabi (bulk entitlement for rabi), and 10 units to hot weather (bulk entitlement for HW) season. Of the bulk entitlement, the volume of water guaranteed to be supplied to each user association is the applicable water entitlement. Similarly, if 15 & 10 units (bulk water entitlement i.e. sectoral allocation for the domestic and industrial water supply) are distributed seasonwise, then this would be quota for the water supply entitlement holder.

#### **4. PROCEDURE FOR DETERMINATION AND IMPLEMENTATION OF ENTITLEMENTS**

A step by step procedure in determining, issuance, monitoring, and evaluation of the “Entitlement Programme” is shown in Figure 1.

##### **4.1 Compilation of Information and data of irrigation projects**

The following information will be compiled by RBA from the approved Project Report and records with project authorities in respect of each project under the Programme (viz Format I & II as Annexure 1 and 2) and submit to MWRRA as soon as project is included in the Entitlement Programme.

- design utilization in kharif, rabi , hot weather,
- live, dead, gross storages,
- total cultivable command area (CCA),
- evaporation loss (annual, seasonal),
- river losses (if any pick-up weir is on downstream side of the storage dam),
- river gain (post monsoon flow, return / regeneration flow, if any),
- water allocation to bulk consumers for lift, pressurised irrigation system in the influence area of the project,
- Sanctioned lift irrigation, pressurised irrigation systems and corresponding CCA,
- net delineated CCA of flow area , total CCA of the project considering CCA on permissible lift from reservoir and canal lift and area of pressurized /drip irrigation systems sanctioned during project operation,
- water allocation to the domestic sector,
- water allocation to the industrial sector,

- list of WUAs at minor level with name, address, registration number and date, category, minor number, no. of beneficiaries, delineated CCA under each WUA.
- details about canal / distribution network i.e. main canal and also each distributary/branch canal/minor etc. length/ discharge capacity/ present status of functioning/ and whether lined or unlined.

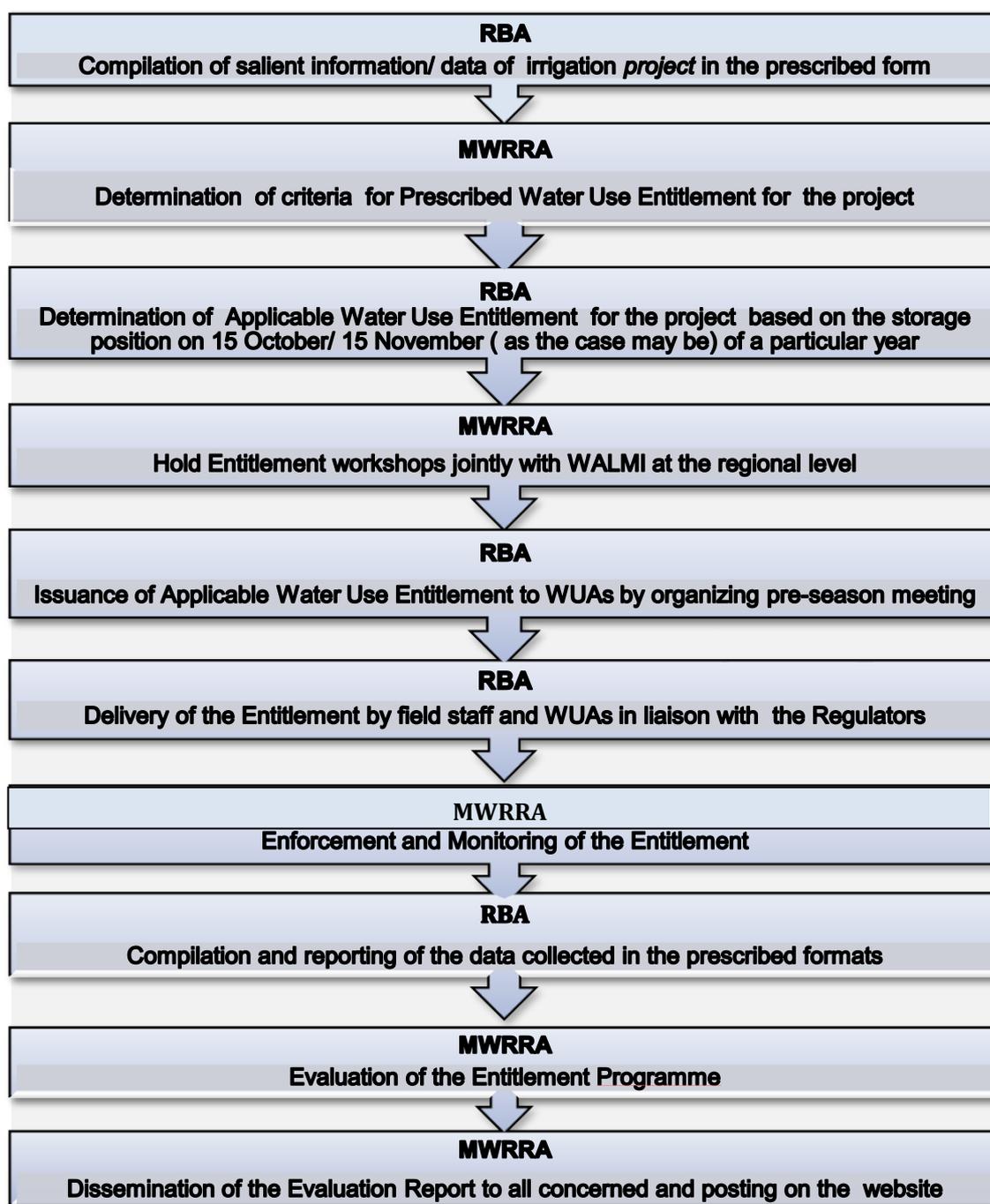


Figure 1: Step by step procedure in implementation of 'Entitlement Programme'

The following table gives the conveyance efficiencies to be adopted for the main/branch canal, distributaries, and minor.

**Table: Normative conveyance efficiencies**

Canal type	Lined		Unlined	
	before improvement	after improvement	before improvement	after improvement
<b>Main/ Branch Canal</b>	0.85	0.95	0.80	0.85
<b>Distributary</b>	0.85	0.90	0.80	0.85
<b>Minor</b>	0.85	0.90	0.80	0.85

**Note:** Field officers are not expected to adopt lower values for conveyance efficiencies without prior approval of WRD in case of major projects, and of concerned Chief Engineer in respect of other category projects.

#### **4.2 Determination of criteria for prescribed water use entitlement**

The Authority will work out the Prescribed Unit Water Use Entitlement (PUWUE) for use in Kharif season in a normal year as per project planning and also for the year in question after considering the water storage position for determining the Applicable Entitlement by RBA. (See Format -I at Annexure - 1)

The Authority will work out the PUWUE for use in Rabi /HW season in a normal year as per project plan and also for the year in question after considering water storage position for determining the Applicable Entitlement by RBA. (Format –II at Annexure - 2). While doing this, a cut in non-irrigation uses (viz. drinking and industrial) shall be applied in a year when the reservoir has not attained its designed capacity so as to share the distress as per the following:-

#### **(A) For domestic WUEs - only for Municipal Corporations**

<b>Reservoir storage as percentage of the design storage</b>	<b>Cut in the Entitlement (%)</b>
Between 100% to 75%	No cut
75% to 50%	10%
50% to 33%	20%
Less than 33%	25%

**(B)For Industrial WUEs**

<b>Reservoir storage as percentage of the design storage</b>	<b>Cut in the Entitlement (%)</b>
100% to 75%	No cut
75% to 50%	<ul style="list-style-type: none"><li>• 10% cut for bulk users viz. individual industrial units / industrial estates / MIDC (who subsequently supply retail also)</li><li>• No cut for thermal plants</li><li>• 10% cut for industries drawing directly from reservoirs to be identified separately at agreement stage</li><li>• 15% cut for industries using water as a raw material</li></ul>
Below 50%	<ul style="list-style-type: none"><li>• 20% cut for bulk users viz. individual industrial units / industrial estates / MIDC (who subsequently supply retail also)</li><li>• No cut for thermal plants</li><li>• 20% cut for industries drawing directly from reservoirs to be identified separately at agreement stage</li><li>• 25% cut for industries using water as a raw material.</li></ul>

**N.B.:-** (i) A cut to the irrigation block quantum (Neera, Pravara and Godavari canals) is to be applied in proportion to the live storage percentage as on October 15 of the respective year.

(ii) Above cuts to be made applicable only after equitable distribution in the sub-basin, if any, has been resorted to during the year in question.

### **4.3 Computation of applicable water use entitlement**

#### **4.3.1 Kharif season**

The Applicable Unit Water Use Entitlement (Quota) for Kharif season will be worked out by RBA representative officer, only if the live storage attains at least 33% of the designed live storage. It will be on the basis of the PUWUE (Kharif) for the given year. This will be determined as follows:

**Applicable entitlement for Kharif use for a WUA = PUWUE (Kharif) \* CCA of WUA**

#### **4.3.2 Rabi season**

The Applicable Unit Water Use Entitlement (Quota) for Rabi season will be worked out by RBA representative officer on the basis of the PUWUE (Rabi) for the given year as determined on the basis of storage position of the year. This will be worked out as follows:

**Applicable entitlement for Rabi use for a WUA = PUWUE (Rabi) \* CCA of WUA**

#### **4.3.3 Hot Weather season**

The Applicable Unit Water Use Entitlement (Quota) for HW season will be worked out by RBA representative officer on the basis of the PUWUE (HW) for the year under consideration determined by the MWRRA on the basis of storage position of the year as follows:

**Applicable entitlement for HW use for a WUA = PUWUE (HW) \* CCA of WUA**

#### **4.3.4 General procedure applicable for all the three seasons**

1. RBA representative officers (Superintending Engineer for major and Executive Engineer for medium and minor projects) shall accord approval to Applicable Entitlement Quota for WUAs for utilisation during Kharif, Rabi and H.W. seasons.
2. Before the commencement of the season, Project Authority (Superintending Engineer for major and Executive Engineer for medium and minor projects) will convene a pre season meeting of all WUAs and inform them about Applicable Water Entitlement (Quota) admissible to them. They will plan rotation schedule (number of rotations, probable dates of each rotation & probable quantum of water required during each rotation) in consultation with WUAs.
3. The WUA / PLA has a right to check the calculations of the Applicable Entitlement and may raise objections if there is a discrepancy in approach.
4. WUA / PLA can plan crops to be grown during the season considering admissible Applicable Entitlement.
5. Regulators concerned must be invited for such meetings. Concerned regulators and management engineers and other field staff should attend such pre-season meetings.
6. The minutes of the pre-season meeting will be prepared and copy endorsed to the MWRRA. These minutes will form the basis for resolving disputes, if any.

7. In case of doubt / difficulty in computation of the applicable entitlement, the concerned RBA representative officer may consult the MWRRA for clarification.
8. WUAs may utilize the balance Applicable Entitlement admissible to them for the Kharif and Rabi seasons during the subsequent irrigation season with due accounting for losses wherever possible. The WUAs can plan their utilization suitably and have freedom of selecting suitable cropping pattern.
9. The Applicable Unit Water Use Entitlement (Quota) for Kharif season will be worked out by RBA representative officer only if the live storage attains at least 33% of the designed live storage.

#### **4.4 Issuance of applicable water use entitlements**

Pre-season meetings of WRD staff and WUAs are held to facilitate proper planning of crops to be grown during the upcoming irrigation season depending upon the availability of water. The participants are field WRD officials, representatives of WUAs and concerned regulators. The meetings are held before the commencement of Rabi and HW seasons. The WUAs are apprised about the applicable entitlement for the season to be issued by the concerned RBA. The programme of rotation (nos., timings, duration, volume, etc.) is planned with the consent of WUAs with due consideration of the pre-sowing moisture content of the soils of the WUA command area. The minutes of the meeting will be drawn and circulated among the concerned and also forwarded to MWRRA. The decisions taken in the pre-season meeting are the commitments on the part of WRD to WUAs.

#### **4.5 Delivery, Enforcement and Monitoring of the Entitlements**

- Irrigation management shall be carried out by PLA / CLA/ DLA / WUA as the case may be. Necessary coordination between project officers and WUAs be established and requisite discharge through the canal system be maintained during each rotation period. Irrigation shall be carried out from tail-to-head. In case of any lapses, the regulator concerned and the field officer shall find an appropriate solution to resolve the situation. The planned dates of rotation for release of water be informed to concerned WUAs. The volume of water to be released and rotation schedule shall be planned in consultation with the WUAs during the pre-season meetings.

- Enforcement of entitlements is one of the tasks/ functions of the Authority as envisaged in the Act. The functions of enforcement, regulation are carried out by the Authority through appointment of third party regulators who are from among the WRD field management staff but not associated with irrigation management of the respective projects/ sections. Regulators are responsible to MWRRA as far as enforcement and regulation of Entitlements are concerned. The functions and powers of regulators and the responsibilities of WRD officials in respect of implementing the Entitlement Programme are given in the guidelines titled “Procedure for Regulation & Enforcement of Entitlements – Powers and Functions of Regulators and Responsibilities of Water Resources Department’s Officers” prepared by MWRRA in 2007.
- During the rotation period , regulator shall visit WUA area/ and the measuring device (MD) location during every rotation as given in Guidelines for Regulators and check the status of functioning of measuring devices and exercise test check on the discharge delivered at the measuring device. He will record his/her remarks in the register maintained with WUA. Regulator shall act as per guidelines and report to the Authority in detail in case any omission is observed and not resolved by the field officer.
- The regulators appointed by the Authority will act as per the Guidelines for Regulators. The Authority will call for the proposal for appointment of the regulators from the Superintending Engineers concerned. The SE shall propose names of those engineers under his control who have the requisite experience of irrigation management and who are not concerned with the management of the concerned WUA. After scrutiny of the proposal, Authority will issue appointment orders of regulators and entrust the responsibility of WUAs under a particular project to them. Regulators appointed will work as representatives of the Authority and shall work impartially.
- Authority is considering the creation of a separate cadre of Regulators under Director General, Water and Land Management Institute, Aurangabad so as to have effective third party monitoring and regulation.
- The regulators appointed by the Authority shall exercise test check on delivery of entitlements and sign in the gauge register in token of confirmation of delivery of due supplies. In case of short supplies, the regulator may record accordingly in the register and inform (in the prescribed slip) the project authority for making good the supply during subsequent rotations.

- Necessary planning for achieving requisite discharges at various off-take points to achieve adequate quantum of water for every CLA / DLA / WUA be carried out jointly by PLA/ CLA / DLA / WUA and concerned field officer.
- Shortfall in supply of due entitlement in a particular rotation be made good in the subsequent rotations. However, this will not apply if WUA voluntarily requests for further additional cut in supplies due to rainfall etc.

#### **4.5.1 Calibration and flow measurement**

(a) MDs of standard make shall be installed at strategic locations such as head of minor, distributary, branch and main canal from where Entitlement is to be given to a WUA. The common types of MDs are weir, Parshall Flume and cut-throat-flume where the rate of flow is a function of the head. All these devices give accurate results when constructed, installed and operated properly. The procedure / specifications stipulated by the manufacturer should be adhered to. MDs should be installed in straight reaches as per the specification of manufacturer.

(b) Common shortcomings noticed at gauge sites i.e. measuring device locations are:

- (i) Non-availability of discharge tables.
- (ii) Improper gauge location.
- (iii) Damaged gauge plate.
- (iv) Improper zero setting.
- (v) Actual throat width and throat width used in discharge formula not the same.
- (vi) Hydraulic jump not formed i.e. flume under submergence.

In order to overcome these shortcomings, all calibrations are ideally carried out at beginning of Rabi season. The following table indicates the level of responsibility for calibration and cross checking of flow measurements. In all cases, the date and time of calibration, results, corrective measures/ adjustments done to MDs to obtain the rated discharge should be entered in the gauge discharge table enclosed with Annexure 4 of the Entitlement register.

Location of MD	Officer responsible for calibration and cross checking of flow measurement	Remarks
<b>Major project</b>		
Head of main canal	SE	To be verified jointly by dam in-charge EE & management EE.
Off-take points of distributary / branch canal	EE	<ul style="list-style-type: none"> <li>• To be verified by the concerned management SDE / SDO /AE Gr.-I / AAE.</li> <li>• 10% or minimum 1 recording to be checked by EE</li> </ul>
Off-take points of minor	SDE / SDO /AE Gr.-I / AEE	<ul style="list-style-type: none"> <li>• To be verified by concerned Sectional Engineer /AE Gr. II</li> <li>• 10% or minimum 1 recording to be checked by EE</li> </ul>
<b>Medium Project</b>		
Head of main canal	EE	To be verified jointly by dam in-charge EE & the management EE
Off-take points of distributary / branch canal	SDE / SDO /AE Gr.-I / AEE	<ul style="list-style-type: none"> <li>• To be verified by concerned management SDE / SDO /AE Gr.-I / AAE.</li> <li>• 10% or minimum 1 recording to be checked by EE</li> </ul>
Off-take points of minor	SDE / SDO /AE Gr.-I / AEE	<ul style="list-style-type: none"> <li>• To be verified by concerned Sectional Engineer / AE Gr.II</li> <li>• 10% or minimum 1 recording to be checked by EE</li> </ul>
<b>Minor Project</b>		
Head of main canal	SDE / SDO /AE Gr.-I / AEE	<ul style="list-style-type: none"> <li>• To be verified by SDE / SDO /AE Gr.-I / AEE.</li> <li>• 10% or minimum 1 recording to be checked by EE</li> </ul>
Head of minor	SDE / SDO /AE Gr.-I / AEE	<ul style="list-style-type: none"> <li>• To be verified by Sectional Engineer/AE Gr. II&amp; WUA representative.</li> <li>• 10% or minimum 1 calibration to be checked by SDE / SDO /AE Gr.-I / AEE</li> </ul>

(c) Penalty will be imposed to those lift irrigation schemes which do not provide measuring devices.

- (d) Report of monitoring of calibration and cross checking of flow measurements by various officers as per above table will be sent to MWRRA. The SE will send report to this effect to MWRRA after end of the season.

#### 4.5.2 Registers to be maintained

Authority has evolved various proformas for monitoring the delivery of entitlements to WUAs. Some registers as per below are required to be maintained by WUA and Field officer of RBA:

Title	Annexure No.	To be maintained by
Sanctioned Water Use Entitlement	3 (1)	both WUA and RBA
Applicable Water Use Entitlement	3 (1)	both WUA and RBA
Field Book of Gauge Readings	4	both WUA and RBA
Kharif Water Use by WUA	5 (1)	both WUA and RBA
Rabi Water Use by WUA	5 (2)	both WUA and RBA
Hot Weather Water Use by WUA	5 (3)	both WUA and RBA
Water Use for Domestic Purpose.	6(1)	both PLA and RBA
Water Use for Industrial Purpose	6(2)	both PLA and RBA
Entitlement Actually Received and Sanctioned to WUAs	7	RBA
Register of Wells	8	RBA
Bill of Water Charges	9	RBA
Recovery of Water Charges.	10	RBA

- The projectwise proforma (except Gauge Field Book) will be got computerized by the RBA officer maintained and preserved in the concerned division / circle office. Copies of annexure may be furnished as per requirement.
- In addition, WUA & concerned RBA sub-division office / division office & circle office shall compile and furnish details to Authority as per proforma prescribed and also maintain such detailed information in connection with rotations for a particular irrigation year.
- The project authority shall maintain a register of wells in the command area, beneficiary-wise (Annexure 9).

- WUAs shall promote use of groundwater to meet the objective of keeping the groundwater table in its area of operation beyond 3 m from the ground level to avoid incidence of salinity and waterlogging.
- Care should be taken to see that the measuring device is not tampered with by any miscreant nor any malpractice employed in its operation. Watch shall be kept both by WUA and the project authority. If it is found that MD is tampered with, action shall be taken as stipulated in Sections 60, 61 and 62 of the Maharashtra Management of Irrigation System by Farmers (MMISF) Act XXIII of 2005.
- The Gauge Discharge Table shall be available with the measurer, Canal Inspector (CI), Sectional Officer (SO) and also with the concerned WUA.
- Daily readings as stipulated in Annexure-4 of this Technical Manual shall be recorded in the bound "Gauge Field Book of Water Use" – which should be in the bound form. It be signed with date mentioned as per Annexure 4.
- In addition to the above instructions incorporated in Annexure-3 of the MMISF Rules, 2006 shall also be scrupulously followed. (See Annexure -11)

#### **4.6 Evaluation of the Entitlement Programme**

##### **4.6.1 Information to be furnished before the start of season**

RBA representative shall conduct pre-season projectwise meeting well before start of the season and furnish a copy of minutes of pre-season meeting to Authority in the proforma prescribed. Such meeting shall be conducted before start of Kharif / Rabi as well as HW season.

RBA representative shall furnish copy of Annexure 3 (1), Annexure 3(2) alongwith copy of the minutes of pre-season meeting.

##### **4.6.2 Information to be furnished at the end of the season**

- (a) RBA representative i.e. SE / EE shall arrange to furnish copy of Annexures 5(1), 5(2) and 5(3) after every rotation by e-mail to Authority within 5 days after last day of rotation for every rotation during Kharif / Rabi / HW season. RBA office shall furnish hard copy of Annexures 5(1), 5(2) and 5(3), clearly indicating the reach i.e. Head/ Middle/Tail of the WUA and remarks of regulator concerned, duly signed by all concerned, to Authority within 15

days after closure of the season. The information in Annexures 5(1), 5(2) and 5(3) is to be furnished for all WUAs under the project.

- (b) RBA representative shall furnish details about any reference or correspondence made by concerned regulator in connection with enforcement of rotation or about any pink slip issued by the regulator.
- (c) The Executive Engineer representing the RBA shall furnish information in prescribed format for Kharif / Rabi/ HW seasons to the Authority after each season within 10 days. This information is to be furnished project-wise and WUA-wise.

#### **4.6.3 Information to be furnished at the end of Irrigation Year**

- (a) RBA representative viz. SE / EE shall furnish hard copy of Annexure 7. This information is to be furnished project-wise and concerned officer shall verify the number of WUAs in head/middle/tail reach and the corresponding area under the WUAs and also the corresponding details regarding the applicable and actual entitlement delivered. This information is to be furnished within 15 days after the last rotation of a particular year.
- (b) The SE should also send report for each major / medium project about evaporation losses, conveyance losses in canal system, sedimentation survey outcome to MWRRA at the end of water year

#### **4.6.4 Evaluation Report**

MWRRA makes evaluation of the Entitlement programme annually. The Executive Engineer shall nominate an officer of the rank of AE Gr.II/ Sectional Engineer from divisional office to act as the nodal person for liaising with the Authority. The names, contact numbers of such officers, and e-mail id of the division office shall be furnished to the Authority. The concerned officer shall be responsible for submission of data/information to the Authority well in time.

Regular annual evaluation of the Entitlement Programme being implemented on irrigation projects in the State is carried out. It is a part of the monitoring of the Programme. Evaluation of performance is made on the basis of entitlement delivered, number of beneficiaries covered, equity aspect and water use efficiency. Since there is freedom of cropping pattern, WUAs adopt cropping pattern considering market conditions and available well water. Performance of

regulators is also assessed. Evaluation reports for 2008-09, 2009-10, 2010-11, and 2011-12 have been prepared and hosted on the website of the Authority.

#### **4.6.5 Dissemination of the Evaluation Report**

The MWRRA prepares an evaluation report of the 'Entitlement Programme based on the information received from RBA / field staff. The report is circulated among all concerned and posted on the Authority website [www.mwrra.org](http://www.mwrra.org) for wide dissemination.

### **5. DISPUTE RESOLUTION**

- The State Government shall authorize CE / SE / EE/ SDE or an equivalent officer or retired engineers from government as the Primary Dispute Resolution Officer (PDRO) to resolve disputes with regard to the issuance or delivery of entitlements under the Act [(Section 22 (1)].
- The PDRO shall follow such procedure as may be prescribed by the Authority while hearing the dispute.
- In resolving the dispute, the PDRO shall take into account the observations of the regulator noted down in the gauge register during rotation.
- Any person aggrieved by the order of the PDRO may, within 60 days from the date of receipt of such order, prefer an appeal to the Authority.
- In case of any ambiguity in the meaning of some terms / definitions used in this Manual, the provisions of the Act will prevail.

### **6. TARIFF**

- The project authority will levy tariff for bulk volumetric supplies to irrigation and water supply as per the existing tariff orders.
- The WUA shall collect water charges from the beneficiaries as per section 27 of the MMISF Act, 2005.
- The Project Authority shall maintain data on water charges, billed and collected, in the proforma at Annexure 10.



## ANNEXURE – 1

### FORMAT

#### CHECKLIST OF ENTITLEMENT

**Prescribed Unit Water Use Entitlement for flow irrigation for Kharif season in  
Normal year**

Sr.No.	Description	Data
1	2	3
1	<b>Name of Project</b>	
2	Location	
i)	Taluka	
ii)	District	
3	Basin	
4	Sub-Basin	
5	Name of River/Nala	
<b>6 (a)</b>	Catchment Area (Sq.km.)	
(b)	Intercepted Catchment Area (Sq.km.)	
<b>(c)</b>	<b>Free Catchment Area</b> (Excluding the C.A of all U/s storages) (Sq.km.)	
7	Type [Major/Medium/Minor/Minor(LS)]	
<b>8</b>	<b>Year of completion</b>	
9	Type of dam	
10	Gross storage (Mm <sup>3</sup> )	
<b>11</b>	<b>Live storage</b> (Mm <sup>3</sup> )	
12	Dead storage (Mm <sup>3</sup> )	
13	75% dependable flow at site (Mm <sup>3</sup> )	
14	50% dependable flow at site (Mm <sup>3</sup> )	
15	TBL (m)	
16	MWL (m)	
17	FRL (m)	
18	Spillway crest level (m)	
19	MDDL (m)	
20	Maximum dam height (m)	
21	Sill level of head regulator/s (m)	
22	Length of LBC (km)	
23	Length of RBC (km)	
24	Capacity of LBC (m <sup>3</sup> /sec)	
25	Capacity of RBC (m <sup>3</sup> /sec)	
26	GCA (ha)	
27	CCA (ha)	
28	ICA (ha)	
<b>29(a)</b>	Total number of water user associations in the project.	
<b>(b)</b>	<b>Total delineated area of the project for flow irrigation</b> (ha)	
(c)	No. of WUAs under entitlement	
(d)	WUA-wise delineated area of the project for flow irrigation (ha)	
(e)	Total number of members	

Sr.No.	Description	Data
(f)	WUA-wise number of members.	
30	Cropping intensity % as per project report	
i)	Kharif	
ii)	Two seasonal	
iii)	Rabi	
iv)	Hot weather	
v)	Perennial	
<b>31</b>	<b>Approved utilisation</b> (for irrigation) (Mm <sup>3</sup> ) as per project report.	
i)	Kharif	
ii)	Two seasonal	
iii)	Rabi	
iv)	Hot weather	
v)	Perennial	
32	Non irrigation approved (Mm <sup>3</sup> ) with breakup as per project report.	
i)	Kharif	
ii)	Rabi	
iii)	Hot weather	
<b>33</b>	<b>Non irrigation actual</b> (Mm <sup>3</sup> )	
i)	Kharif	
ii)	Rabi	
iii)	Hot weather	
<b>34</b>	<b>Seasonwise evaporation loss</b> (Mm <sup>3</sup> )	
i)	Kharif	
ii)	Fair weather	
iii)	Total annual	
<b>35</b>	<b>Post monsoon inflow</b> (dry weather) (Mm <sup>3</sup> )	
i)	As per Project Report	
ii)	Actual as per observation (Preferred)	
<b>36</b>	<b>Reduction in Live Storage due to siltation</b> in reservoir (Mm <sup>3</sup> )	
i)	Actual as per survey	
ii)	Or as per formula (considering free catchment 6c) [1.5 hectare meter per 100 Sq.km. of catchment area per year].	
<b>37</b>	<b>Any other commitment</b> (2nd class irrigation, Malguzari rights, Nistar rights etc. If any.) (Mm <sup>3</sup> )	
i)	Kharif	
ii)	Rabi	
iii)	Hot weather	
<b>38</b>	<b>Water availability @ canal head for Kharif.</b>	
i)	Water utilisation as per Project Report (Mm <sup>3</sup> ).	
ii)	Evaporation loss {34 (i) + 34 (ii) } or 34 (iii). (Mm <sup>3</sup> ).	
iii)	Deduction for siltation (36i or 36ii) (Mm <sup>3</sup> ).	
iv)	Deduction for non irrigation use (33i + 33ii + 33iii) (Mm <sup>3</sup> ).	
v)	Deduction for irrigation use (excluding Kharif) (31 ii+31 iii+31 iv+31 v) (Mm <sup>3</sup> ).	
vi)	Deduction for any other commitment 37 (i + ii + iii) (Mm <sup>3</sup> ).	

Sr.No.	Description	Data
vii)	Water available@canal head before reservoir lift {38i-38(ii+iii+iv+v+vi) (Mm <sup>3</sup> ).	
<b>39</b>	<b>Deductions for reservoir lift</b>	
	<b>Reservoir lift</b>	
	<b>Case (A) where canal takes off directly from the reservoir.</b>	
<b>a)</b>	<b>Flow lift</b>	
i)	Maximum permissible area at 6% of CCA (ha)	
ii)	Actual sanctioned area (ha)	
iii)	Maximum allowable water allowance at 3.6% of water available at canal head (Mm <sup>3</sup> ) i.e. 38 (vii).	
iv)	Actual water allowance for sanctioned area. =(ii / i)*0.036* water @ canal head (38 vii) in (Mm <sup>3</sup> )	
<b>b)</b>	<b>Pressurised lift (Drip/Sprinkler)</b>	
i)	Maximum permissible area at 14% of CCA (ha)	
ii)	Actual sanctioned area (ha)	
iii)	Maximum allowable water allowance at 5.65% of water available @ canal head (38vii) in (Mm <sup>3</sup> )	
iv)	Actual water allowance for sanctioned area =(ii / i)*0.0565* water @ canal head (38 vii) in (Mm <sup>3</sup> )	
<b>c)</b>	<b>Canal lift (Outside command)</b>	
i)	Maximum permissible at 10% of (CCA-perennial area) (ha)	
ii)	Actual sanctioned area (ha)	
iii)	Maximum allowable water allowance @ 7% of water available at canal head i.e. 38 (vii) (Mm <sup>3</sup> ).	
iv)	Actual water allowance for sanctioned area =(ii / i)*0.07* water @ canal head (38 vii) in (Mm <sup>3</sup> )	
<b>40</b>	<b>Case (B) where canal takes off from the D/s of pick up weir.</b>	
<b>a)</b>	<b>Lift from dam storage.</b>	
i)	Maximum permissible area at 1% of CCA (ha)	
ii)	Actual sanctioned area (ha)	
iii)	Maximum allowable water allowance at 0.6% of water available at canal head (38 vii) (Mm <sup>3</sup> ).	
iv)	Actual water allowance for sanctioned area =(ii / i)*0.006* water @ canal head (38 vii) in (Mm <sup>3</sup> )	
<b>b)</b>	<b>Pressurised lift (Drip/Sprinkler)</b>	
i)	Maximum permissible area at 14% of CCA (ha)	
ii)	Actual sanctioned area (ha)	
iii)	Maximum allowable water allowance at 5.65% of water available at canal head (38 vii) (Mm <sup>3</sup> ).	
iv)	Actual water allowance for sanctioned area =(ii / i)*0.0565* water @ canal head (38 vii) in (Mm <sup>3</sup> )	
<b>c)</b>	<b>Lift on river portion between dam to pickup weir.</b>	
i)	Maximum permissible area at 5% of CCA (ha)	
ii)	Actual sanctioned area (ha)	
iii)	Maximum allowable water allowance at 3% of water available at canal head (38 vii) (Mm <sup>3</sup> )	
iv)	Actual water allowance for sanctioned area =(ii / i)*0.03* water @ canal head (38 vii) in (Mm <sup>3</sup> )	
<b>d)</b>	<b>Deduction for transit loss in the river portion in fair weather.</b>	

Sr.No.	Description	Data
	= 10% of water @ canal head.	
e)	<b>Deduction of water quantity for non-irrigation use in between the river portion (between dam to pick up weir)</b>	
f)	<b>Canal Lift ( Outside command )</b>	
i)	Maximum permissible area at 10% of [CCA - Perennial area] (ha)	
ii)	Actual sanctioned area (ha)	
iii)	Maximum allowable water allowance at 7% of water available at canal head (38 vii) (Mm <sup>3</sup> )	
iv)	Actual water allowance for sanctioned area =(ii / i)*0.07* water @ canal head (38 vii) in (Mm <sup>3</sup> )	
41	Net water available at canal head in (Mm <sup>3</sup> )	
	Case A (38 vii)-39(aiv+biv+civ).....or	
	Case B (38 vii)-40(aiv+biv+civ+d+e+fiv)	
42	Net water available at canal head considering canal losses (Item No.41 * conveyance efficiency #) (Mm <sup>3</sup> )	
43	Net Area (i.e. 29 b) \$ (ha)	
44	<b>Prescribed unit water use entitlement for Kharif (42/43) (Mm<sup>3</sup>/ha)</b>	
	i.e. cum / ha	
	Delta (cm)	
#	(1) Conveyance efficiency of 0.80 is assumed for minor tanks, 0.80*0.80 (i.e. 0.64) for medium projects and 0.80*0.80*0.80 (i.e. 0.512) for major projects. (2) The efficiency be taken as per Para 4.1 of the MWRRA's Technical Manual for Irrigation Entitlement (3) In case actual observed data for conveyance efficiency is available, the observed data be used provided it is duly approved.	
\$	Net Area is the delineated area of the project (in case the entire CCA is delineated). If the entire CCA is not yet delineated, the CCA be taken as Net area. The Net area is solely flow irrigation area (i.e. exclusive of the lift area).	
NB:-	6 (b) Intercepted Catchment Area is that part of the catchment area which drains into upstream storages / weirs of the project under consideration.	

**ANNEXURE – 2**  
**FORMAT**  
**CHECKLIST OF ENTITLEMENT**

**Prescribed Unit Water Use Entitlement for flow irrigation for Rabi season in  
Normal Year**

Sr. No.	Description	Data
1	<b>Name of Project</b>	
2	Location	
i)	Taluka	
ii)	District	
3	Basin	
4	Sub- Basin	
5	Name of River / Nalla	
<b>6 (a)</b>	<b>Catchment Area ( Sq km )</b>	
(b)	Intercepted Catchment Area (sq.km.)	
<b>(c)</b>	<b>Free Catchment area</b> (excluding the C.A. of all U/s storages) (sq.km.)	
7	Type [Major/Medium/Minor/Minor(LS)]	
8	<b>Year of Completion</b>	
9	Type of dam	
10	Gross Storage (Mm <sup>3</sup> )	
<b>11</b>	<b>Live Storage</b> (Mm <sup>3</sup> )	
12	Dead Storage (Mm <sup>3</sup> )	
13	75% dependable flow at site (Mm <sup>3</sup> )	
14	50% dependable flow at site (Mm <sup>3</sup> )	
15	TBL (m)	
16	MWL (m)	
17	FRL (m)	
18	Spillway Crest Level (m)	
19	MDDL (m)	
20	Maximum Dam height (m)	
21	Sill Level of Head Regulator/s (m )	
22	Length of LBC ( km)	
23	Length of RBC ( km)	
24	Capacity of LBC (m <sup>3</sup> / sec)	
25	Capacity of RBC (m <sup>3</sup> / sec)	
26	GCA (ha)	
<b>27</b>	<b>CCA</b> (ha)	
28	ICA (ha)	
<b>29 (a)</b>	<b>Total number of water user associations in the project.</b>	
<b>(b)</b>	<b>Total delineated area of the project for flow irrigation</b> (ha)	
(c)	No. of WUAs under entitlement	
(d)	WUA-wise delineated area of the project for flow irrigation (ha)	

Sr. No.	Description	Data
(e)	Total number of members	
(f)	WUA- wise number of members.	
30	Cropping intensity % as per project report	
i)	Kharif	
ii)	Two Seasonal	
iii)	Rabi	
iv)	Hot Weather	
v)	Perennial	
<b>31</b>	<b>Approved utilisation (for irrigation) (Mm<sup>3</sup>) as per Project Report</b>	
i)	Kharif	
ii)	Two Seasonal	
iii)	Rabi	
iv)	Hot Weather	
v)	Perennial	
32	Non-Irrigation approved (Mm <sup>3</sup> ) with breakup as per Project Report.	
i)	Kharif	
ii)	Rabi	
iii)	Hot Weather	
<b>33</b>	<b>Non Irrigation Actual (Mm<sup>3</sup>)</b>	
i)	Kharif	
ii)	Rabi	
iii)	Hot Weather	
<b>34</b>	<b>Seasonwise Evaporation Loss (Mm<sup>3</sup>)</b>	
i)	Kharif	
ii)	Fair Weather	
iii)	Total Annual	
<b>35</b>	<b>Post monsoon inflow ( dry weather) (Mm<sup>3</sup>)</b>	
i)	As per Project Report	
ii)	Actual as per observation (preferred)	
<b>36</b>	<b>Reduction in Live Storage due to Siltation in Reservoir (Mm<sup>3</sup>)</b>	
i)	Actual as per Survey	
ii)	Or as per formula (considering free catchment 6c) [1.5 hectare meter per 100 sq.km. of catchment area per year)	
<b>37</b>	<b>Any other commitment (2nd class irrigation, Malguzari rights, Nistar rights etc if any)</b>	
i)	Kharif	
ii)	Rabi	
iii)	Hot Weather	
<b>38</b>	<b>Water availability @canal head.</b>	
	Water utilisation as per project report (Mm <sup>3</sup> )	
	Deduct water utilisation for use in Kharif Mm <sup>3</sup> (31i+33i+34i+37i)	
	Water available at the beginning of Rabi (38i-38ii) (Mm <sup>3</sup> )	
<b>39</b>	<b>Deductions to get water available at the canal head.</b>	
i)	Deduct 34ii as per for evaporation loss (Mm <sup>3</sup> )	
ii)	Deduction for siltation (36i or ii) (Mm <sup>3</sup> )	

Sr. No.	Description	Data
iii)	Deduction for fair weather non-irrigation use ( 33ii+33iii) (Mm <sup>3</sup> )	
iv)	Deduction for any other commitment 37 (ii+iii) (Mm <sup>3</sup> )	
v)	Water available at canal head before reservoir lift {38iii+35ii-39(i+ii+iii+iv)}	
<b>40</b>	<b>Deductions for Reservoir Lift</b>	
	<b>Reservoir Lift</b>	
	<b>Case (A) Where canal takes off directly from the reservoir</b>	
<b>(a)</b>	<b>Flow Lift</b>	
i)	Maximum permissible area at 6 % of CCA (ha)	
ii)	Actual sanctioned area (ha)	
iii)	Maximum allowable water allowance at 3.6 % of water available at the canal head (Mm <sup>3</sup> ) i.e.39 (v)	
iv)	Actual water allowance for sanctioned area	
	= (ii / i)*0.036* water @ canal head (39v) in (Mm <sup>3</sup> )	
<b>(b)</b>	<b>Pressurised Lift (Drip/Sprinkler)</b>	
i)	Maximum permissible area at 14 % of CCA (ha)	
ii)	Actual sanctioned area ( ha)	
iii)	Maximum allowable water allowance at 5.65 % of water available @ the canal head (39v) (Mm <sup>3</sup> )	
iv)	Actual water allowance for sanctioned area	
	= (ii / i)*0.0565* water at canal head (39v) in (Mm <sup>3</sup> )	
<b>(c)</b>	<b>Canal Lift (Outside command)</b>	
i)	Maximum permissible at 10 % of (CCA -perennial area) (ha)	
ii)	Actual sanctioned area ( ha)	
iii)	Maximum allowable water allowance @ 7 % of water available at canal head (39v) (Mm <sup>3</sup> )	
iv)	Actual water allowance for sanctioned area	
	= (ii / i)*0.07* water @ canal head (39v) in (Mm <sup>3</sup> )	
<b>41</b>	<b>Case (B) Where Canal takes off from the D/S of pick up weir</b>	
<b>(a)</b>	<b>Lift from dam storage</b>	
i)	Maximum permissible area at 1 % of CCA (ha)	
ii)	Actual sanctioned area ( ha)	
iii)	Maximum allowable water allowance at 0.6 % of water available at the canal head (39v) (Mm <sup>3</sup> )	
iv)	Actual water allowance for sanctioned area	
	= (ii / i)*0.006* water at canal head in (Mm <sup>3</sup> )	
<b>(b)</b>	<b>Pressurised Lift (Drip/Sprinkler)</b>	
i)	Maximum permissible area at 14 % of CCA (ha)	
ii)	Actual sanctioned area ( ha)	
iii)	Maximum allowable water allowance at 5.65 % of water available @ the canal head (39v) (Mm <sup>3</sup> )	
iv)	Actual water allowance	
	= (ii / i)*0.0565* water @ canal head (39v) in (Mm <sup>3</sup> )	
<b>(c)</b>	<b>Lift on river portion between Dam to pickup weir</b>	
i)	Maximum permissible area at 5 % of CCA (ha)	
ii)	Actual sanctioned area ( ha)	
iii)	Maximum allowable water allowance at 3 % of water available @ the	

Sr. No.	Description	Data
	canal head (39v) (Mm <sup>3</sup> )	
iv)	Actual water allowance	
	= (ii / i)*0.03* water @ canal head (39v)in (Mm <sup>3</sup> )	
<b>(d)</b>	<b>Deduction for transit loss in the river portion in fair weather</b>	
	= 10% of water @canal head	
<b>(e)</b>	<b>Deduction of water quantity for non-irrigation use in between the river portion (between dam to pick up weir)</b>	
<b>(f)</b>	<b>Canal Lift (Outside command)</b>	
i)	Maximum permissible at 10 % of (CCA -perennial area) (ha)	
ii)	Actual sanctioned area (ha)	
iii)	Maximum allowable water allowance @7% of water available at canal head (39v) (Mm <sup>3</sup> )	
iv)	Actual water allowance for sanctioned area	
	= (ii / i)*0.07* water @ canal head (39v)in (Mm <sup>3</sup> )	
<b>42</b>	Net water available at canal head (Mm <sup>3</sup> )	
	Case A (39v)-40(aiv+biv+civ) .....or	
	Case B (39v)-41(aiv+biv+civ+d+e+fiv)	
<b>43</b>	Net water available at canal head considering canal losses (Item No.42 * conveyance efficiency #) in (Mm <sup>3</sup> ).	
<b>44</b>	Share of water for Hot Weather irrigation as per Project Report (Mm <sup>3</sup> )	
<b>45</b>	Water available for Rabi flow irrigation (43- 44)	
<b>46</b>	Net Area (i.e. 29 b) \$ (ha)	
<b>47</b>	<b>Prescribed unit water use entitlement for Rabi (45/46) (Mm<sup>3</sup>/ha)</b>	
	i.e. cum / ha	
	Delta (cm)	
<b>48</b>	<b>Prescribed unit water use entitlement for HW (44/46) (Mm<sup>3</sup>/ha) ✧</b>	
	i.e. cum / ha	
	Delta (cm)	
<b>#</b>	(1) Conveyance efficiency of 0.80 is assumed for minor tanks, 0.80*0.80 (i.e. 0.64) for medium projects and 0.80*0.80*0.80 (i.e. 0.512) for major projects. (2) The efficiency be taken as per Para 4.1 of the MWRRA's Technical Manual for Irrigation Entitlement (3) In case actual observed data for conveyance efficiency is available, the observed data be used provided it is duly approved.	
<b>\$</b>	Net Area is the delineated area of the project (in case the entire CCA is delineated). If the entire CCA is not yet delineated, the CCA be taken as Net area. The Net area is solely flow irrigation area (i.e. exclusive of the lift area).	
<b>✧</b>	If the water planning of the project, apportion water between Rabi and Hot Weather seasons, then the entitlement for the Hot Weather season is to be computed in proportion to the apportionment.	
<b>NB:-</b>	6 (b) Intercepted Catchment Area is that part of the catchment area which drains into upstream storages / weirs of the project under consideration.	

### ANNEXURE 3(1)

Ref. – Act Clause 11 (g)

#### Register for Sanctioned Water Use Entitlement for a Normal Year\*

Name of Division:

District: \_\_\_\_\_

Name of Project:

\_\_\_\_\_ Irrigation Division \_\_\_\_\_

(Place)

Irrigation Year: -

For Irrigation Use

Sr. No	Name & Address of WUA	Registration No. & Date	Category of WUA flow/lift combined	Minor/ Distributary No.	Total area CCA (ha)	No. of Beneficiaries	No.& Name of villages benefitted	Normal Sanctioned water use entitlement for Kharif (Tcum)	Normal Sanctioned water use entitlement for Rabi (Tcum)	Normal Sanctioned water use entitlement for Hw (Tcum)	Total entitlement (Tcum)
1	2	3	4	5	6	7	8	9	10	11	12

\*Note : Entitlement shown in columns 9 & 10,11 & 12 shall be for  
Designed live storage in reservoir full condition

### ANNEXURE 3(2)

Ref. – Act Clause 11 (g)

#### Register for Applicable Water Entitlement

Name of Division:

District: \_\_\_\_\_

Name of Project:

\_\_\_\_\_ Irrigation Division \_\_\_\_\_

(Place)

Irrigation Year: -

For Irrigation Use

Sr. No.	Name & Address of WUA	Registration No.& Date	Category of WUA flow/lift combined	Minor/ Distributary No.	Total area CCA (ha)	No. of Beneficiaries	No.& Name of villages benefitted	Applicable water entitlement for Kharif (Tcum)	Applicable water entitlement for Rabi (Tcum)	Applicable water entitlement for HW (Tcum)	Applicable total entitlement (Tcum)
1	2	3	4	5	6	7	8	9	10	11	12

Note: Applicable Entitlement shown in column 9, 10, 11 &12 shall be for the reservoir storage condition as on start of the irrigation season

## ANNEXURE 4

### Gauge Field Book of Water Use

Name of Project \_\_\_\_\_ at \_\_\_\_\_ Tal. \_\_\_\_\_ Dist. \_\_\_\_\_

Taluka: \_\_\_\_\_

District: \_\_\_\_\_

For the Year: \_\_\_\_\_

\_\_\_\_\_ Irrigation Sub-Division \_\_\_\_\_

\_\_\_\_\_ Irrigation Division \_\_\_\_\_

Rotation Number: 1 / 2 / 3 / \_\_\_\_\_

For KHARIF / RABI / H.W.

Location of Gauge	Rotation Days											Total Qty. of water supplied during rotation in Tcum	Signature of authorised representative of WUA	Signature of Department's authorised representative (with designation)	Remarks
	No. of Rotation	1	2	3	4	5	6	7	8	9	10				
Rotation Date															
Gauge reading timing															
@ 8.00 hours															
@ 17.00 hours															
Average Gauge															
Qty. supplied per day	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Σ Q				

Tcum = Thousand cubic meter

Enclosure: - Gauge vs Discharge Table with the type of measuring device

Signature of Regulator (with date of visit)

**Note:** (1) When and by whom the calibration is carried out? .....

(2) When and by whom cross checking of flow measurements is carried out? .....

## ANNEXURE 5(1)

Seasonwise Water Use of WUA for the Year \_\_\_\_\_  
Reach Head / Middle / Tail

Name of Division: \_\_\_\_\_

Taluka: \_\_\_\_\_

Name of Project: \_\_\_\_\_

District: \_\_\_\_\_

Sr. No.	Season	Applicable water Entitlement (Tcum)	Rotation details				Remarks of Project Authority or its representative	
			Actual dates of rotations		Actual volume supplied rotation wise (Tcum)	Cumulative volume (Tcum)		Date of visit & remarks of regulator (with signature)
1	2	3	4		5	6	7	8
	KHARIF		No.	Rotation Date				
				From	To			
		1						
		2						
		3						
			4					

Note: Figure shown in column (3) will depend on actual reservoir storage available for Kharif season which will be decided by the Project Authority.

Tcum = Thousand cubic meter

## ANNEXURE 5(2)

Seasonwise Water Use of WUA for the Year \_\_\_\_\_  
Reach Head / Middle / Tail

Name of Division: \_\_\_\_\_

Taluka: \_\_\_\_\_

Name of Project: \_\_\_\_\_

District: \_\_\_\_\_

Sr. No.	Season	Applicable water Entitlement (Tcum)	Rotation details				Remarks of Project Authority or its representative	
			Actual dates of rotations		Actual volume supplied rotation wise(Tcum)	Cumulative volume (Tcum)		Date of visit & remarks of regulator (with signature)
1	2	3	4		5	6	7	8
	RABI		No.	Rotation Date				
				From	To			
			1					
			2					
			3					
		4						

Note: 1) Figure shown in column (3) will depend on actual reservoir storage available for Rabi season which will be decided by the Project Authority.

2) Water saved in Rabi will be considered in H.W. entitlement with appropriate deduction of losses.

Tcum = Thousand cubic meter

### ANNEXURE 5(3)

Seasonwise Water Use of WUA for the Year \_\_\_\_\_  
Reach Head / Middle / Tail

Name of Division: \_\_\_\_\_

Taluka: \_\_\_\_\_

Name of Project: \_\_\_\_\_

District: \_\_\_\_\_

Sr. No.	Season	Applicable water Entitlement (Tcum)	Rotation details				Remarks of Project Authority or its representative		
			Actual dates of rotations	Actual volume supplied rotation wise(Tcum)	Cumulative volume (Tcum)	Date of visit & remarks of regulator (with signature)			
1	2	3	4		5	6	7	8	
	HOT WEATHER		No.	Rotation Date					
				From	To				
		1							
		2							
		3							
			4						

## ANNEXURE 6(1)

Ref. – Act Clause 11 (g)

### Register for Entitlement and its Use

Name of Division: \_\_\_\_\_

**for Domestic use**

Name of Project: \_\_\_\_\_

For the Year: \_\_\_\_\_

Name of water use Entity: \_\_\_\_\_

Utility located @ \_\_\_\_\_ Tal. \_\_\_\_\_ Dist. \_\_\_\_\_

Entitlement Register No. \_\_\_\_\_

Sr.No.	Name and address of Water Supply Entity with Registration Number & date	Category of Entity** & population level	Water lifting point***	Sanctioned Water use Entitlement		Actual utilisation of the Entitlement	
				Mld	Tcum	Mld	Tcum
1	2	3	4	5a	5b	6a	6b

\*\* = Category of water use entity Municipal Corporation, Municipal Council, Regional/Rural Water Supply Scheme, Village Water Supply Scheme, City/Taluka/Village/Grampanchayat (Group)

\*\*\* = 1) Directly from WRD storage. 2) From river below storage by lift. 3) From canal, a) having appropriate storage facility. b) without storage facility. 4) Storage owned by the user.

Tcum = Thousand cubic meter      Mld= Million litres per day

Enclosure: Monthly Abstract (Calenderwise) of flow meter

## ANNEXURE 6(2)

Ref. – Act Clause 11 (g)

### Register for Entitlement and its Use

Name of Division: \_\_\_\_\_

**for Industrial use**

Name of Project: \_\_\_\_\_

For the Year: \_\_\_\_\_

Name of water use Entity: \_\_\_\_\_

Industry located @ \_\_\_\_\_ Tal. \_\_\_\_\_ Dist. \_\_\_\_\_

Entitlement Register No. \_\_\_\_\_

Sr. No.	Name and address of Industrial Entity with Registration number & date	Category of Entity(+)	Sanctioned water use Entitlement						Actual utilisation of the Entitlement						
			Kharif *		Rabi@		Hot Weather\$		Kharif *		Rabi@		Hot Weather\$		
			Mld	Tcum	Mld	Tcum	Mld	Tcum	Mld	Tcum	Mld	Tcum	Mld	Tcum	
1	2	3	4a	4b	4c	4d	4e	4f	5a	5b	5c	5d	5e	5f	

+ = Category of Entity: i) Industry in the business of Drinking Water. ii) Industry other than one above.

\* = Kharif Season – Water rates for the Kharif Season.

@ = Rabi Season – Water rates at the normal rates for the Rabi Season

\$ = Hot Weather Season – Water rates for the Hot Weather Season

Tcum = Thousand cubic meter      Mld= Million litres per day

Enclosure: Monthly Abstract (Calenderwise) of flow meter

## ANNEXURE 7

Abstract Showing Percentage of Entitlement Actually Received  
vs. Sanctioned to WUA for the Irrigation Year\_\_\_\_\_

Name of Division: \_\_\_\_\_

Taluka: \_\_\_\_\_

Name of Project: \_\_\_\_\_

District : \_\_\_\_\_

Sr. No.	WUA in _____	No. of WUAs	Corresponding Delineated Area (ha)	Applicable Water Entitlement (Tcum)			Actual entitlement received (Tcum)			Percentage			Area irrigated during the season (ha)			No. of farmers taken up irrigation during the season			Remarks
				Kharif	Rabi	Hot Weather	Kharif	Rabi	Hot Weather	Kharif	Rabi	Hot Weather	Kharif	Rabi	Hot Weather	Kharif	Rabi	Hot Weather	
1	2	3	3a	4			5			6			7			8			9
				Kharif	Rabi	Hot Weather	Kharif	Rabi	Hot Weather	Kharif	Rabi	Hot Weather	Kharif	Rabi	Hot Weather	Kharif	Rabi	Hot Weather	
	Head reach																		
	Middle reach																		
	Tail reach																		

Tcum = Thousand cubic meter

WUA = Water User's Association

## ANNEXURE 8

### Register of Wells

Name of Project \_\_\_\_\_ Tal \_\_\_\_\_ Dist \_\_\_\_\_

Branch No./Distributary No./Minor No. \_\_\_\_\_

Area of crops on well / Branchwise / Villagewise \_\_\_\_\_

Village: \_\_\_\_\_ Taluka: \_\_\_\_\_

Area \_\_\_\_\_ ha

Year \_\_\_\_\_

Sr. No.	Outlet No.	Name of beneficiaries	Survey No.	Gut No.	No. of wells	Cash crop area on well									Remarks
						Sugar cane	Banana	Grape	Pomegranate	Plum/Berry (Bor)	Others	Total	Cereals	Grand Total	
1	2	3	4	5	6	7(a)	7(b)	7(c)	7(d)	7(e)	7(f)	7(g)	7(h)	7(i)	8

## ANNEXURE 9

### Volumetric Supply to Water Users Association Bill of Water Charges

Irrigation Division: \_\_\_\_\_

Name of Project : \_\_\_\_\_

Irrigation Sub-Division : \_\_\_\_\_

Irrigation Section : \_\_\_\_\_

Bill No. : \_\_\_\_\_

Bill Date: \_\_\_\_\_

Water User's Association		Season	Year	Entitlement (Tcum)		Water Rate (Rs./Tcum)	Basic water charges (Rs.) 6 * 7	Local fund (Rs.) 20% of 8	Penalty (**)	Current assessment (Rs.) 8+9+10	Previous dues (Rs.)	Total Bill (Rs.) 11+12
Id	Name			Applicable*	Used							
1	2	3	4	5	6	7	8	9	10	11	12	13

**Note.-**

- 1) Seasonwise **Last dates** for payment of bill : (*Kharif* 1 Feb.), (*Rabi* 15 May), (Hot Weather 15 Oct.)
- 2) **Concession** as per the prevailing rate structure.
- 3) **Surcharge** / year shall be levied for late payment as per the prevailing rate structure.

\*In case of Hot Weather Season, Applicable entitlement shall be inclusive of water allowed to carry over to Hot Weather (conditions apply).

\*\* **Penalty** is imposed on Water User's Association for violation of Maharashtra Management of Farmers Irrigation Systems Act, 2005 and rules thereof as per details specified below.

Sr. No.	Offence / Irregularity	Section of the Act	Rule No.	Penalty Amount (Rs.)
Total				

**Sectional Officer**  
Irrigation Section

## ANNEXURE 10

### Volumetric Supply to Water Users Association Receipt of Water Charges

Irrigation Division: \_\_\_\_\_

Name of Project: : \_\_\_\_\_

Irrigation Sub-Division : \_\_\_\_\_

Irrigation Section : \_\_\_\_\_

Bill No. : \_\_\_\_\_ Payment Date: (in time / late)

Receipt No.: \_\_\_\_\_ Receipt Date: \_\_\_\_\_

Water User's Association		Details of Bill						Details of Amount paid				
		Basic water charges (Rs.)	Local fund	Penalty (Rs.)	Current assessment	Previous dues (Rs.)	Bill Amt. (Rs.)	Concession (Rs.)	Surcharge (Rs.)	Revised bill Amt. (Rs.)	Amount Paid (Rs.)	Dues (Rs.)
Id	Name	3	4	5	6	7	8	9	10	11	12	13
1	2	3	4	5	6	7	8	9	10	11	12	13

**Note.-**

If amount paid is less than the revised Bill Amount, mention / highlight one of the remarks given below:

- 1) Water User's Association agrees to pay the complete bill in principle but paid in part because of certain difficulties mentioned in its application.
- 2) Water User's Association does not agree to pay Rs. \_\_\_\_\_ towards \_\_\_\_\_ for reason 1 -----, 2-----  
-----, 3 ----- (also vide application)

**Sectional Officer**  
\_\_\_\_\_ Irrigation Section

## **ANNEXURE-11**

### **Flow Measurement and its Record**

#### **(A) Flow Measurement and its Record**

- (i) Copy of the record drawing and discharge table of measuring devices shall officially be given to Water User's Association and kept with Sectional Officer, Canal Inspector, Gauge Karkoon of the Water Resources Department.
- (ii) All the dimensions as well as control levels of measuring device as per design be checked before handing over the same to Water User's Association. If there are any deviations or errors, the same should be rectified.
- (iii) Ensure that the device is hydraulically functioning properly (e.g. absence of formation of hydraulic jump, existence of free flow condition, etc.)
- (iv) Ensure that gauge is accurate and readable.
- (v) If measuring device consists of some moving components, they shall be maintained periodically (e.g. oiling, greasing, filling of ink, replacement of data sheets or pens, etc.)
- (vi) In case of manual discharge measurements, the gauge and discharge measurements shall be taken at least twice a day (preferably at 12 hours interval) in the presence of the representatives of the Water Resources Department and Water User's Association and signed in conformity. The measurements may be recorded in the format as given in Annexure - 4
- (vii) In case of automatic measuring device, the result sheets shall be signed by both the agencies. As far as flow meters in pressure pipelines are concerned, the measurements may be taken once a day and signed by both the agencies.

#### **(B) Periodic Evaluation of Measuring Devices**

##### **(1) Evaluation of measuring devices in open channel**

The evaluation of measuring devices in open channel shall be carried out at least once a year by the Canal Officer or his nominee. Following general procedure may be followed (The specific items to be included in evaluation will depend upon the type of measuring device):-

- (i) Obtain design drawing and discharge table.
- (ii) Before releasing water, take actual dimensions of all components and control levels (e.g. u/s Canal Bed Level, d/s Canal Bed Level, hump level /sill level, zero gauge level etc.
- (iii) Note down condition of gauge chamber (e.g. extent of silting, readability and accuracy of gauge plate, functioning of connecting pipes etc.).
- (iv) After releasing water observe the hydraulic performance (e.g. formation of hydraulic jump, free flow condition, etc.).
- (v) Compare actual dimensions, levels and hydraulic performance with the designed one and if there are any variations or deviation, the same shall be rectified.
- (vi) Ensure that discharge table is based on actual dimensions or levels or appropriate discharge coefficients.
- (vii) In case of measuring devices provided with automatic recorders, the measurements should be verified with manual measurements (e.g. volume recorded by automatic recorder in a given period be verified by manual measurements). These automatic devices be calibrated periodically from the authorized agencies.
- (viii) After evaluation if any deviations or errors are detected, the reasons for the same should be identified and remedial measures be suggested to bring back the device in proper working condition. This should be brought to the notice of the concerned Water User's Association. Thereafter the concerned Water User's Association shall get the same repaired and set right at its own cost within a period of 30 days.

**(2) Evaluation of water meters in pressure pipelines**

As per section 47 of the Act, the responsibility of providing, installing and calibration of water meters for flow measurement in every water lifting device lies with the Lift Irrigation Water User's Association. The water meters shall have to be as per Bureau of Indian Standards (BIS). The Canal Officer, duly empowered in this behalf, has the powers to inspect and test the water meters. The measurements shall be verified based on discharging capacity of the pump considering suction head, delivery head, head loss in pipe line, horse power of the pump etc. and running period. This shall be done at least twice a year. If the meter is found to be defective,

the concerned Water User's Association shall get the same repaired and set right at its own cost within a period of 30 days.

**(C) Ascertaining volume of water during the period of non-functioning of measuring device:-**

Following procedure may be followed to ascertain the volume of water during the period of non-functioning of a measuring device.

**(1) Open Channels**

The head regulator through which water supply is regulated in open channel, if falls, pipe crossings are available at convenient location may be calibrated to estimate the discharge. The arrangements for measuring actual water levels at these structures will have to be provided. The measurements and discharge be recorded as usual i.e. twice a day and signed by both the agencies.

The period of non-functioning of measuring device shall not be more than 30 days i.e. it shall be repaired and brought into use within 30 days by the concerned Water User's Association. If the device remains out of order for a period exceeding 30 days, the quantity of water measured using other structures as mentioned earlier shall be increased by 25% for billing purposes.

**(2) Lift Irrigation Schemes**

The discharging capacity of the pump considering minimum suction head, actual delivery head, head losses in the pipe line, horse power of the pump shall be computed. The volume of water pumped may be estimated considering this discharging capacity and average running period per day. This volume may be increased by 25% as a penalty for not keeping the meter in working condition, if the measuring device is not repaired and brought into use within a period of 30 days.

## ANNEXURE-12

Format for Recording Minutes of Pre-season Meeting

Date of Meeting: \_\_\_\_\_ Place: \_\_\_\_\_

Sr. No	Particulars			
1	Name of Project			
2	Name of Division			
3	Name of PLA/CLA/DLA/WUA			
4	Season / Irrigation year	Kharif / Rabi /HW of Irrigation year20.. – 20..		
5	Applicable Entitlement as conveyed by the service provider (Tcum )			
6	Quantum indented by PLA/CLA/DLA/WUA & total quantum (Tcum)	WUA	Area under WUA	Quantum indented (Tcum)
		<b>Total</b>		
7	Probable rotation period & rotationwise probable quantum as decided in meeting	Rotation dates		Probable quantum (Tcum)
		from	to	
	Rotation no. 1			
	Rotation no. 2			
	Rotation no.3			
	Rotation no.4			
	<b>Total</b>			
8	Name of Executive Engineer			
9	PLA/ CLA/DLA/WUA office bearers concerned with and invited for the meeting & their attendance	Name of WUA	Name of representative attending meeting	Attendance ( Yes / No )
10	Names of regulators concerned with PLA/CLA /DLA/ WUAs invited for meeting & their attendance	Name of regulator		Attendance (Yes / No )
11	General (remarks of officer conducting meeting )			

Copy submitted to Secretary, MWRRA, Mumbai.

Copy to concerned PLA/CLA/DLA/WUA

Copy to concerned field officer

Copy to concerned regulators

## ANNEXURE 13

### Feedback from Annual Regional Entitlement Workshops

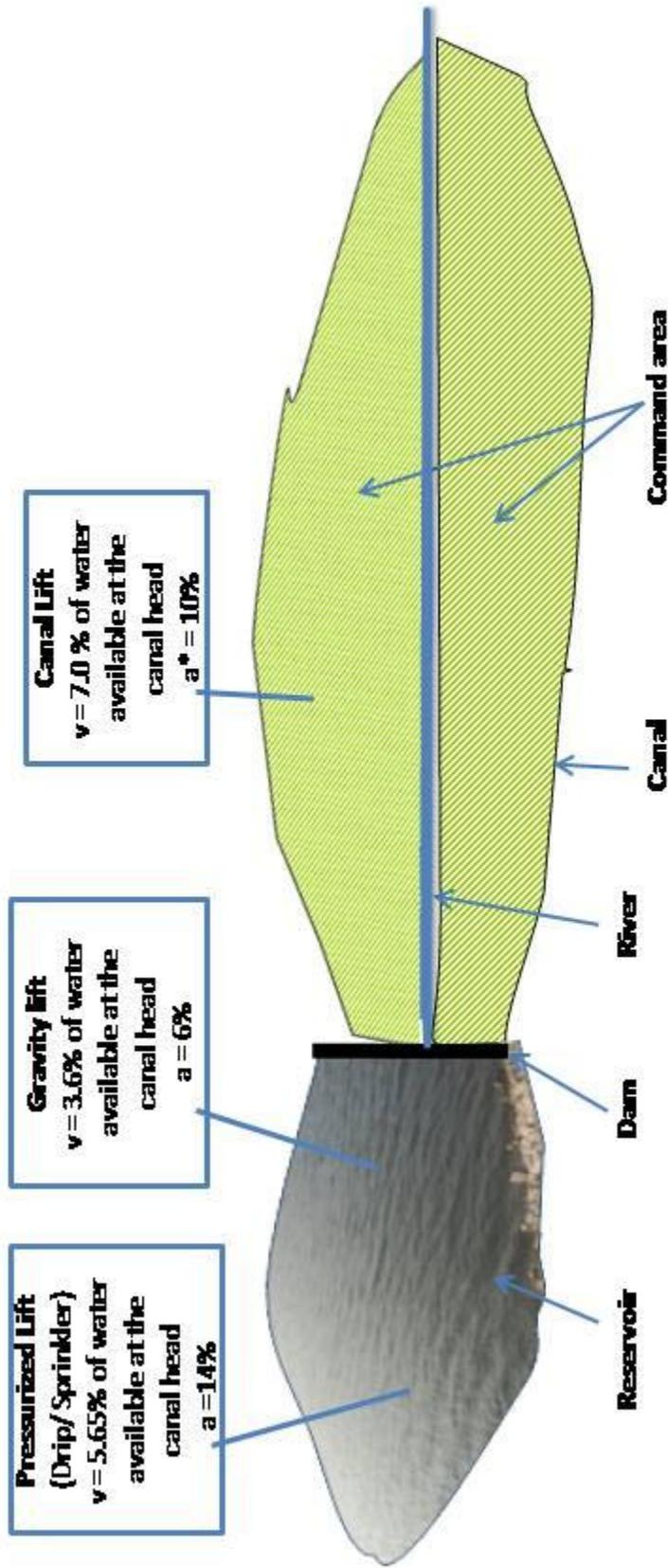
The Authority, jointly with the WALMI, Aurangabad organizes Entitlement workshops annually in the six revenue divisions before the commencement of Rabi season. These workshops provide a platform for interaction among the WRD field officers and staff, WUA management staff and regulators. Success stories of WUAs who have implemented the Entitlement Programme effectively are presented in the workshop, which inspires other WUAs to improve their performance. Initially, from 2007-08 to 2009-10, annually only one workshop was organized, followed by 3 workshops in 2010-11, and 6 workshops commencing from 2011-12 onwards are being organized. The participation grew from 74 to about 950 persons in these workshops. One special workshop for 'Regulators' was also organized at WALMI, Aurangabad in March 2010. The regulators are appointed by the MWRRRA to enforce and ensure the deliverance of entitlement to WUAs. In all, 61 regulators participated in the workshop. Difficulties encountered by WUAs in irrigation management, the field staff of WRD in its implementation and by the Regulators in monitoring the entitlement programme were discussed freely during these workshops. The major issues and suggestions put forth by the participants during the deliberations were as follows:

- The portion from the water charges recovered from the farmers and paid to the Government by the WUAs and returnable to them are not received in time. It should be paid in one installment before the rabi season.
- The programme of irrigation rotation is prepared without taking the WUAs into confidence, which discourages their effective participation.
- The Govt. needs to subsidize the small farmers who construct farm ponds even in the initial reaches of command.
- Appropriate honorarium to the Chairman and other Office Bearers of WUAs should be given by the Government. Required provision in the grant to be given to WUAs may be made accordingly.
- The M&R grants due to WUAs as per WRD GR dated 22/6/2007 are inadequate. The GR needs to be revised immediately as per MWRRAs proposal.
- Due to inadequate manpower with WUAs, the recovery of arrears of water charges is low.

- The regulators are not receiving the reimbursement of incidental expenses / T.A. bills etc.
- The Section Offices of irrigation on the field are understaffed. The beat staff and their leader are absent in the Section Offices. There are difficulties in distribution of water, conducting *panchanamas*, recovery of water charges etc.
- Prior to handing over the area to WUAs, ensure that release of water in canal system reaches the tail end.
- The measuring devices installed should be in good condition. The gauge should be precisely calibrated & maintained.
- The representatives of WUAs should be invited to the meetings of canal advisory committees. The tail end WUAs should receive their rightful share of water.
- Government should make efforts to constitute federation of WUAs.
- The fishery rights of the tank water should be entrusted to WUAs.
- It is necessary to impart training to the Secretaries of WUAs.
- The incomplete works of repairs of the irrigation system in the delineated area of WUAs and those formed under the Cooperative Act should be carried out by the WRD on top priority.
- Grants be made available through the Agriculture Department for implementing drip irrigation system for expansion of irrigated area.
- There should be coordination between WUAs and management staff of WRD.

MWRRA tries to address the above issues by holding meetings with the concerned field officers of WRD to find feasible solution. If the problem pertains to policy issues, the MWRRA formulates comprehensive proposals for consideration of the WRD. The Authority also follows up with other Departments such as Finance, Agriculture, etc. to act on the proposal.

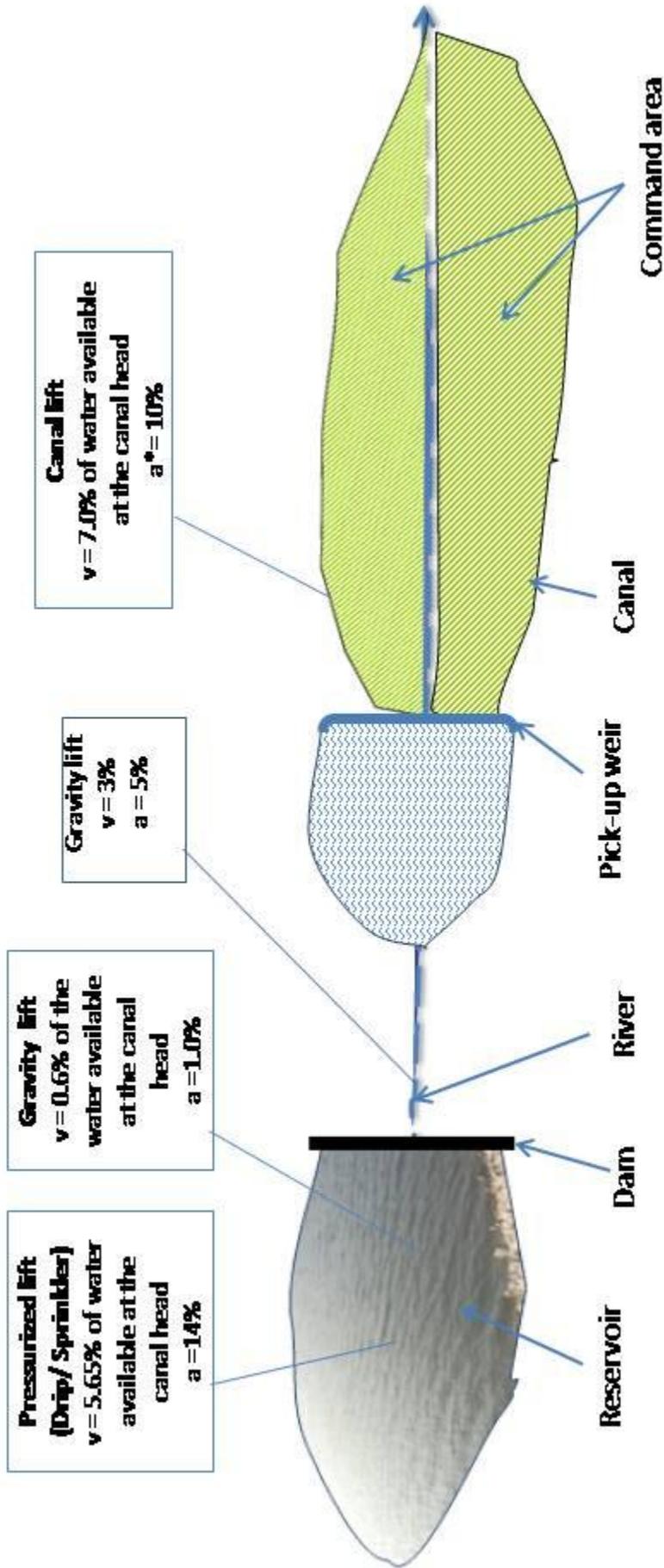
As per the directives in the Govt. circular (WRD, 24/7/2013) for the M&R of the irrigation system, the works of repairs to old canals / distributaries, canal cleaning, desilting can be carried out under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). The implementation of this provision may be effected by all the Irrigation Circles so that additional area can be brought under irrigation, especially of the tail reaches.



$v$  = Water allocation,  $Mm^3$ ;  $a$  = Permissible area (% of CCA), ha

$a^*$  = CCA – Perennial crop area as per Administrative Approval

**CASE A:** A Schematic of a reservoir and a canal system showing water allocation ( $v$ ) and permissible area ( $a$ ) for gravity lift, pressurized lift, and canal lift



$v$  = Water allocation,  $Mm^3$ ;  $a$  = Permissible area (% of CCA), ha

$a^*$  = CCA – Perennial crop area as per Administrative Approval

**CASE B:** A schematic of a reservoir , pick-up weir and canal system showing water allocation ( $v$ ) and permissible area ( $a$ ) for gravity lift and pressurized lift schemes







## महाराष्ट्र जलसंपत्ती नियमन प्राधिकरण

Maharashtra Water Resources Regulatory Authority

९ वा मजला, सेंटर - १, वर्ल्ड ट्रेड सेंटर, कफ परेड, मुंबई - ४०० ००५, भारत दुग्धनी : ०२२-२२१५ २०१९ फॅक्स : ०२२-२२१५ ३७६५

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