Guidelines for JSA Assessment

Submitted

То

Water Conservation Department (GoM)

by

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I. Preamble

A. About the Jalyukt Shivar Abhiyan

The Jalyukt Shivar Abhiyan (JSA) is a flagship program of Govt. of Maharashtra (GoM) launched in 2015, as per the Government Resolution (G.R.) dated 5th December, 2014. The program aims to tackle the question of recurring droughts and make Maharashtra drought-free by the year 2019. The program is being implemented at village level and is supposed to cover all the villages in five years in a phased manner. Every year few villages in each taluka are selected for the implementation based on pre-defined criteria (i.e. existing incomplete projects, drinking water scarcity, low agricultural productivity, groundwater exploitation etc.). Around 5000 villages are selected each year.

JSA is watershed program with main focus on soil and water conservation activities like trenches, gabions, percolation tanks, cement bunds, nala-deepening, farm level soil conservation activities and so on. Through these activities the program strives to conserve and harvest as much rain-water within village boundary as possible and resolve the problems of water stress during dry spells in monsoon season, shortage of water during rabi season and drinking water scarcity, especially during summer season.

Expected outcomes of the program are to increase in availability of drinking water in the village, increase in level of ground water, increase in area under irrigation, increase in area under fodder crops, Reduction in area under dry land crops and increase in area under irrigated crops, increase in agricultural productivity, increase in moisture protection of land, public participation, environmental improvement etc.

The planning and implementation of the above works is done through convergence of funds from all existing state and centre-level watershed programs as well as from MP, MLA and CSR funds. The planning at the village level has to be carried out in co-ordinated manner i.e. with the help of all concerned departments (Agriculture, Forest, Minor Irrigation, GSDA, RWS and so on) and the plan is to be discussed in the Gram Sabha. The District Collector is supposed to oversee the implementation of the program at the district-level.

B. About the Assessment

One of the requirements of the program is that all the villages should be assessed after the completion of works in the village. This assessment is to be done by third-party and is supposed to be overseen by the District Collector. Currently many organizations are doing the assessment work. However, assessment reports of different agencies (some of them being local NGOs, regional academic institutes etc.) are of varying quality and content. Hence, it has been felt that a common guideline should be evolved and used for the assessment work across the state. This document should serve as such a guideline for the village level assessment of JSA. The document

consists of methodology for assessment, survey formats, planning and steps to be followed, postvisit analysis and finally report writing.

II. Methodology

Following are the main components for the JSA assessment

- To study JSA DPR and understand whole JSA process.

Each JSA village will have a village plan or DPR prepared by the Krushi Sahayak which contains village profile, baseline study, water budget, details of existing interventions and proposed interventions, financial details, revenue map with interventions marked on it, consent letter signed by Sarpanch, Krushi Sahayak, Gram Sevak, TAO etc. This document is an account of the whole planning process and each planning step needs to be understood and assessed in detail before visiting the village.

- To assess the location and quality of works done under JSA.

The on-field assessment is intervention-centered. All the soil and water conservation works need to be visited in the village and need to be geo-tagged. The quality of works need to be assessed (dimensions, construction quality, engineering appropriateness, locational suitability, adherence to watershed principles etc.). The assessment of works on above criteria needs to be done through simple measurements, primary investigation, visual inspection and farmer/resident interviews.

- To understand the impact of works.

Along with the quality check, it is important to assess the utility of the work done and benefits accrued. The benefits can be in terms of increased groundwater availability or reduction in soil erosion or increase in farm incomes or increase in drinking water availability. This needs to be assessed through visual inspection and farmer/resident interviews.

- To pay special attention to areas which were not addressed and solution for the same.

Along with the assessment of individual works, it is important to understand the impacts of JSA on the village as a whole. For this, basic knowledge about the village, its terrain, soils, land use, rainfall patterns, demographics etc. should be acquired through secondary data analysis (before village visit) and through discussions with the villagers during the visit. Based on this understanding, the vulnerable zones (i.e. areas where soils are poor, groundwater availability is poor etc.) should be identified and visited. Interviews of few farmers in these zones must be carried out to understand their problems, proposed solutions and reasons for which these were not taken up under JSA.

- To record suggestions from the stakeholders and recommend suitable alterations in existing processes, if any.

Key interviews with different government officials (Krushi Sahayak, Gram Sevak, TAO, DSAO and officials of other departments) as well as with Sarpanch, members of Village Watershed Committee, Village Water Supply and Sanitation Committee etc. can help in understanding issues faced by them during planning or implementation.

III. Steps of assessment

Steps of assessment consisting of data procurement, desk assessment of JSA plan, preparation for assessment, field visit assessment, post-visit analysis, report writing. All the steps are described below in detailed. A general schedule of assessment work for a village could be as follows:

Day	Activity	
Day-0	Data procurement	
Day-0	Desk assessment of JSA plan	In office
Day-0	Preparation for Assessment	
Day-1	Field Visit	
Day-2	Field Visit	In the Field
Day-3	Field Visit	
Day-4	Report Writing	
Day-5	Report Writing	In Office
Day-6 onwards	Report Review and Finalization	

Table 1 Schedule for assessment

A. Data procurement

1. Contact Taluka Agriculture Officer (TAO) and request for data shown in Table 1 as per format explained below.

Table 2 Data for assessment

Sr. No.	Documents needed	Department/officer				
Of th	ne Taluka					
1	List of villages in taluka with five selection	DSAO,				
	criteria specified in JSA guidelines	Agriculture Dept.				
2	Crop sowing report season wise with crop	TAO, Agriculture				
	and area at village level for all villages for	Dept.				
	2014, 2015, 2016 and 2017.					
Of th	ne selected villages					

Sr. No.	Documents needed	Department/officer
3	Original Jalyukt Shivar Abhiyan Village	TAO, Agriculture
	Plan and modified, if any for 2015-16 for	Dept.
	selected villages	_
4	JSA final expenditure report for 2015-16	DSAO,
	for the village	Agriculture Dept.
5	Single Map (revenue map) showing	TAO, Agriculture
	location of interventions	Dept.
6	Gat Nowise (Survey plot Nowise) list of	TAO/AAO,
	all works done under Jalyukt Shivar	Agriculture Dept.
	Abhiyan.	
7	Gat Nowise list of farmers	Talathi/ Tehshildar

1. Taluka Level Information

- a. List of villages in taluka with five selection criteria mentioned in JYS GR and ranking of villages.
- b. Crop sowing report season wise with crop and area at village level for all villages for previous three years. (see Annexure-A4)

2. Village Level Information

- a. Name and Contact Number of Krishi Sahayak and Gram Sevak.
- b. Original Jalyukt Shivar Abhiyan Village Plan and modified version, if any.
- c. Gat No-wise location list of works done under Jalyukt Shivar Abhiyan.
- d. Any earlier official Third-Party Impact assessment report and concurrent evaluation report and outcomes documentation.
- e. Detailed estimate of works.
- f. List of number of farmers with size of land holding (i.e. Large, medium, small, marginal and land less).
- g. List of habitations and habitation-wise drinking water facility.
- 2. Contact other department officers and request for expenditure list of completed works and estimate of each work. Contact person to procure data and for arranging the field visit could be the same as given in Table 2.

Sr.	Department	Officers						
No.		For documents	For field visit					
1	Agriculture	Taluka Agriculture officer	Assistant Agriculture officer					
2	Forest	Range forest officer	Forest guard					
3	Minor irrigation	Assistant Executive engineer	Junior engineer					
4	GSDA	Assistant Executive engineer	Junior engineer					
5	RWS	Assistant Executive engineer	Junior engineer					

Table 3 Department wise Contact persons

Sr.	Department	Officers						
No.		For documents	For field visit					
6	Water conservation	Assistant Executive engineer	Junior engineer					
7	Gram panchayat	Sarpancha/Talathi	Gram sevak					

B. Desk Assessment of JSA plan

1. Selection criteria

Selection criteria has given in the JSA guidelines as shown in Table 3. Check correctness of all five criteria and observe list of villages in taluka with five selection criteria (Table 1, Sr No. 1) which were selected which were not. Also, verify all selection criteria during meeting with officers and villagers.

Table 4 Selection criteria for JSA village

Selection criteria
1)Is the village part of IWMP/IIDP/RIDF/Gatiman Panlot vikas Karyakram/
Dryland Farming Mission or other ongoing watershed programs?
2)Is the village declared drought affected (production below 50%) this year or
has been declared at least once in the last five years?
3)Is the village tanker-fed or has been tanker fed at least once in last 5 years?
4)Has the village been declared as over exploited village/critical/semi-critical?
5)Is the village part of watershed project and has been declared drought affected
at least once in the last five years?

2. Cropping pattern

Check crop water requirement calculated in the JSA DPR. Verify cropping data and study area under major crops, Kharif crop, Rabi crop, annual crop, fallow land. It helps during interaction with the farmers.

3. Water budget

Check correctness of all calculations given in Table 4- runoff as per Strange's table, calculated runoff using Inglis formula if rainfall is more than 1500 mm, total runoff impounded, deficit/surplus, irrigation water requirement. Ask to officers in the meeting if any discrepancies observed.

	Description
1	Population
2	Geographical area (Ha)
3	Total rainfall in TCM
4	Total water requirement (a+b)
a)	For Drinking
b)	For Irrigation

Table 5 Summary of water budget

	Description
5	Total Runoff as per Strange table
6	Total impounded runoff (c+d)
c)	Due to Old works
d)	New Proposed works
7	Available runoff (5-6)
8	Deficit/ surplus (6-4)

4. Works done under JSA

Check numbers, completion status and amount of all proposed structures in the original as well as modified JSA plan with the expenditure report obtained from DSAO (Table 1, Sr. No. 4). Make department wise summary sheet of all interventions to be assessed during field visit as shown in Table 5.

C. Preparation for on-field assessment

Collect maps and other secondary data to understand the whole village.

a) Taluka Map- (Annexure A2-g)

Download Taluka Map from MRSAC website [http://www.mrsac.gov.in/en/talukamaps]. It helps to understand the location of village in the Taluka, adjoining villages, village boundary and transportation network.

b) Groundwater Recharge Priority map- (Annexure A2-f)

Download GW Recharge Priority Map from GSDA website. [https://gsda.maharashtra.gov.in/index.php/GWRechargePriorityMap] It has drainage map overlaid on village revenue map with survey numbers.

c) Rainfall data

Download rainfall data of the required circle from Maharain website. [https://www.maharain.gov.in] The website provides normal annual rainfall, daily rainfall, annual rainfall, number of dry spell with days, heavy rainfall event etc. recorded at rain gauge circle for current and previous years. Observe worst rainfall year, good rainfall year.

d) Drinking water status (Annexure-A1)

Download drinking water information from NRDWP website. [http://indiawater.gov.in/IMISReports/Reports/Profile/rpt_SearchProfile.aspx?%20Rep =Y] Get habitation level information about drinking water and study source details, source type, delivery report and their functioning status.

e) Soil type map, Land-use, Land-cover map, drainage maps, contour map (Annexure-A2)

Download images from MRSAC website [http://mrsac.maharashtra.gov.in/gsda/] and georeference it using GIS tools. Observe maps single crop/double crop area, non-agriculture area and prepare a list of key locations and gat number of farmers to survey.

f) Google earth (Annexure A2-e)

Get the village shape file and load on google earth. Google Earth has a feature to see images of selected dates from back years. Observe green patches (agriculture area), habitations, storage structures etc.

- g) Census data(Annexure-A3)Download census data from website [http://censusindia.gov.in].
- h) Treatment Potential Map (Annexure A5- Daregaon)

If the assessed village is one selected in 2017-18 or later, there is a treatment-potential map generated for the village by the WCD which should be available at District Agriculture or Taluka Agriculture office. This map contains most of the above-mentioned attributes (such as contour, streams, stream order, land use etc.) and also contains possible locations for soil and water conservation works. Study this map in order to have some idea of the village micro-watershed and possible locations for interventions.

- i) Arrange with TAO and fix date and schedule of village visit. Write formal letter and also request to TAO to arrange for presence of concerned line department officials along with estimates.
- j) Go through the assessment formats and take printouts-based on summary sheet of structures in the village. Prepare check list of survey numbers of beneficiary farmers (2 on either side for each structure) and non-beneficiary farmers to interview during field visit.

D. On-field Assessment

1. List of equipment for field work

- a) Rebound Hammer
- b) Measuring Tape (preferably 30 meters)
- c) Laser Tape
- d) Spirit Level
- e) Hammer
- f) A GPS device or smartphone.

2. Assessment Protocol for JSA Interventions/Works

The assessment work has two main components-

- 1. Technical assessment of JSA works: To check correctness of locations and structural soundness of interventions.
- 2. Utility assessment: To identify beneficiaries and assess impact of JSA works.

In order to accomplish above two objectives, intervention-wise survey formats have been designed which are to be used as guides for recording observations (Annexure B1).

Sample protocols for the assessment are as follows-

- 1. Earthen Nala Bund
 - a. Identify all the ENBs constructed and code them.
 - b. Visit each ENB and fill corresponding form-
 - Using smartphone or GPS device capture geo location
 - Fill answers in the form for suitability of location- order of stream, bed slope etc.
 - Check structural soundness and fill answers in the form- Dimension, spillways provided, pitching, compaction etc.
 - Check utility- Identify at-least two farm plots on either side of the ENB which are possibly equidistant and belong to different farmers
 - c. Identify the farmers and interview them using Farmer Interview form (Annexure-B2)
 - Plot area, gat number, cropping area and yield for last 2-3 years.
 - Effect of JSA increase in water level in dug well, bore well, soil moisture increased, negative effect like water logging
 - Benefit of the JSA works in increase in yield, cropping area

Each engineering intervention was marked as OK/Not-OK based on detailed formats prepared for each engineering structure which included their technical soundness, their suitability of location and their utility.

3. Timeline

[Day-1]

- a) Arrange a meeting with TAO, agriculture assistant of the village and other officials from concerned departments. Present the list of selected sites and locations for visit in the village. Inquire about selection criteria and overall work flow of JSA. List of possible questions
 - i. How was the water budget formed?
 - ii. How were interventions decided? Were there any zones of interest, such as singlecropping zones, or thin-soil areas?

- iii. When was the main gram-sabha, how many people attended?
- iv. Were there any formal or informal requests or suggestion for individual or community work? Were any objections raised during formation of DPR and how were they resolved?
- v. When did work begin? Any interruption, time-lag, reason? How were contractors chosen?
- b) Arrange for a village meeting at a suitable place in the village. Ensure that Sarpanch, Gram Sevak, person in-charge for drinking water supply, male/female members from all the communities and farmers having land in different areas of village and selected gat numbers are present. Inform about purpose of visit and schedule of assessment plan. Bring out a general discussion about water availability (agriculture/drinking water), scarcity periods and mitigation efforts. Inquire about JSA and form a time-line and narrative on the overall process of JSA program. Identify other issues and challenges faced by villagers and ask for general comments. Record items which were requested by villagers during main gram sabha but not done and reasons. Identify beneficiaries and request them to come along for site visits.
- c) Prepare minutes of meeting.
- d) Prepare a site visit schedule and proceed for visit to interventions and record observations as per the intervention-wise assessment formats and beneficiary interviews (see annexure B).

[Day-2]

- a) Continue site visit and recording observations as per the given formats
- b) Review internally, at the end of day, (i) broad observations and (ii) specific areas which need attention.
- c) Also, record assets which were not considered in the water balance.

[Day-3]

- a) Complete pending intervention assessments as per review of previous day.
- b) Assess drinking water situation using the survey format (Annexure B3).
- c) Arrange a sign-off meeting with villagers and discuss preliminary observations.

E. Post field Analysis

After the completion of field visit, sort out all the collected data and field visit photos. Mark all locations of intervention on revenue map and prepared a map of that (see annexure C-Sample report). Mark all habitations on map. Prepare tables and graphs to analyze collected information using structural assessment, beneficiary interview, drinking water assessment formats. Analysis could be done as described below:

Structural assessment formats-

- Mark each structure okay-not okay based on parameter
- Number of works with good quality
- Number of work constructed at suitable location
- Availability of water in the dry spell
- Table of storage capacity and number of fillings
- Direct or indirect lift irrigation
- Number of faulty structure and reason thereof.

Farmer interview formats- Results of expected outcomes will reflect in these formats. Make excel sheet of collected information. It consists of effect due to JSA intervention on increase in water level in the dug well, bore well, water logging in the farms near the streams. Benefit in terms of increases in the yield, Rabi area, kharif area, change in cropping pattern should be analyzed.

- Prepare graph on effect of JSA works
- Prepare graph on benefit of JSA works
- Number of farmers benefited (yes/no)
- Utilization of fallow land

Drinking water formats-

- Types of sources at each habitation
- Seasonal availability, quality and quality in each habitation.
- Effect of JSA on drinking water situation

F. Report writing

Overall assessment has to be write in the report. Structure for report writing described below for a village.

- 1. Introduction
 - 1.1 Overview of taluka
 - 1.2 Overview of village
- 2. Assessment process and logistics- Primary data collection, secondary data sets, parameters involved, survey formats, data processing and Analysis, input and output formats used.
- 3. Pre-visit desk assessment
 - 3.1 Secondary data analysis- put all prepared maps to understand village and their observation
 - 3.2 JSA village plan analysis- attached village plan in the annexure C and verification of water budget, selection criteria, cropping pattern, proposed interventions and discrepancies if any.

4. On field assessment

- 4.1 Marking of location of Intervention- show marked intervention on revenue map
- 4.2 Drain line treatment works- Comment okay-not okay for each structure based on structural soundness and utility check with photos.
- 4.3 Area treatment works- Comment okay-not okay for sampled structure based on structural soundness and utility check with photos.
- **5. Drinking water situation** map showing all habitations, habitation wise before and after situation, situation in summer season, check works done under JSA, outcomes from household survey.
- 6. Summary
 - 7.1 JSA planning and processes- observations about JSA planning and implementation,
 - 7.2 Analysis- intervention assessment summary table (ok-not ok), list of farmers benefited (yes-no), graphs for farmers perspective on effect and benefit due to JSA works, area and drain line treatment works, fallow land utilization.
- **7. Recommendations** Suitable alteration in existing process, planning and implementation, assessment. Action to be taken, reasons thereof.

IV. Annexures

Annexure A

Secondary data and Maps

Annexure A1- Drinking Water Information

State Name : MAHARASHTRA District Name : OSMANABAD Block Name : KALAMB Panchayat Name : MASSA (KH) Abstract Data Total Villages (01/04/2016) :)		
											Total P	opulation (01/04/2016):
No of H	louseholds (01/04/20	16):			955								
No of E	xisting Source/Delive	ry Point/Star	nd Post :		2								
Water \$	Supply Coverage Stat	us (As on 01	/04/2016):		Z Total Habi	tation : 1 Par	rtial Covere	ed Habitatio	on : 0 Fully C	overed Hab	itation : 1		
*No of	Schemes				Total: 1	PWS :	1 Han	dPump :	0 Others	(well, solar	Pump, tubewe	ll etc.): 0	
*Total E	Estimated Cost of Sch	emes (Rs. in	n lakhs)		Total : 7 : 0.00	4.81 PW	S: 74.8	1 Hand	Pump : 0.0	0 Others	(well, solar Pu	mp, tubewell e	
*Total E	Expenditure of Schem	es till <mark>(Rs</mark> . in	lakhs)		Total : 1 0.00	.61 PWS	: 1.61	HandPur	mp: 0.00	Others (w	ell, solar Pump	o, tubewell etc.)	
Source Details													
Sno.	Village Name Habita		ion Name	Туре	Category	/ location	Lo	cation	Туре	Sche	Scheme Name		
1 N	IASSA (KH)	SA (KH) MASSA (KH)		Openwell Ground Water			PWS (0000		W.s.s.Ma (0000828	Vassa(kh) Functional 28269)			
C no	Villa	ao Nomo		Habitati	Delive	ry Point Re	eported		Sab	omo Dotoi		Status	
310.		ge Name			on Name Location			We	Scheme Details			Status	
					Haves C		Banarta						
	1				House Co	Innections	Reported	No of P	louse				
Sno.	Villa	ge Name			Habitation	abitation Name			ction		Scheme Details		
1	MASSA (KH)			MASSA (KH)	565				W.s.s.Mass	a(kh)		
				Exis	ting Privat	e/Public So	ources Re	ported			Location (lama of llow	
Sno.	Village Na	me	Habit	ation Name	e S	ource Type	Category	/	Type of So	urce	Location /Name of Hous		
1	MASSA (KH)		MASSA (KH)	Grou	Ground Water		Deep	Tubewell		Near Bharat Nirman Well		
	MASSA (KH)		MASSA (KH)	Grou	nd Water		Deep	Tubewell		mataga vasti		
2	MASSA (KH)		MASSA (KH)	Grou	nd Water		Deep	Tubewell		harajan vasti		
2 3	MASSA (KH)		MASSA (KH)	Grou	nd Water		Deep	Tubewell		near dev dev	ba temple	
2 3 4	5 MASSA (KH) MASSA (KH)				Grou	nd Water		Deep	Tubewell		mail gali		
2 3 4 5	MASSA (KH)	6 MASSA (KH) MASSA (KH)						Deep	lubewell		near keicha d	lagadu house	
2 3 4 5 6	MASSA (KH) MASSA (KH)				Ground Water				Deep Tubewell			garmpanchayat	
2 3 4 5 6 7	MASSA (KH) MASSA (KH) MASSA (KH)		MASSA (KH)	Grou	nd Water		Deep	lubewell		garmpanchay	al firms	

Annexure A2- Maps





b) Soil type map



c) Drainage map



d) Contour map derived from DEM



e) Google earth view



f) GW Recharge Priority map



g) Taluka map



Annexure A3- Census data

District Name	Sub District Name	Village Name	Total Area (in Hect)	Total House holds	Total Popul ation of Village	Total Schedul ed Castes	Total Schedule d Tribes	% tribal populati on	Net Area Sown (in Hects)	Irrigate d Area (in Hects)	Canals Area (in Hects)	Wells/ Tube Wells Area (in Hects)	Tanks/ Lakes Area (in Hects)	Total Unirriga ted Land Area (in Hects)
Osmana bad	Kalamb	Massa (kh)	2440.	955	4361	782	126	2.89	2366	131.57	0.00	131.57	0.00	2235

Annexure A4- Yearly Crop sowing report

	गावाचे	खतेदार	एकुण	पोट	सुधारीत	खरीप	उस	ख.	बाजरी	मका	साळ	इ.तृण	एकुण
	नाव	संख्या	भौ. क्षेंञ	खराबा	क्षेंञ	क्षेंञ		ज्वारी				धान्ये	
१३-१४	मस्सा	१३८७	२३५७	४४	२४०१	२०२०	२४	३००	१२०	३३०	३६	१०	७९६
१४-१५	मस्सा 🖲	१३८७	રરૂપ૭	४४	२४०१	२०००	भर	२२५	२८१	२३०	९०	0	८२६.८
१५-१६	मस्सा	१३८७	२४०१	४४	२३५७	१९००	१४	२२	५४	१८२	0	0	२५८
१६-१७	मस्सा	१४९३	२४०१	88	२३५७	८६	१४	२२	५४	१८२	२	0	२६०

Annexure A5-Treatment potential map



Annexure B

Assessment formats

Annexure B1 – Intervention wise Assessment formats

List of Forms

Form 1: Cement Nala Bund (CNB)	21
Form 2: Earthen Nala Bund	24
Form 3: Unlined Farm Pond	26
Form 4: Lined Farm pond	28
Form 5: Loose Boulder Structure/ Gabion Bund	30
Form 6: Continuous contour Trenches (CCT)	32
Form 7: Stream deepening and widening/Desilting	34
Form 8: Compartment Bunding(CB)	36
Form 9: Terracing	38
Form 10: Old paddy land repair	40
Form 11: Sub Surface bund (SSB)	41
Form 12: Repair of Cement Nala Bund (CNB)	42
Form 13: Repair of Percolation tank(PT)/Earthen Nala bund (ENB)	44

Form 1: Cement Nala Bund (CNB)

Dat	e: Village:	: Taluka:	Dist	trict: St	ructure Coc	le:
	Question	Possible options for answer	Answer to be filled	Medium	Whom to ask?	Purpose
	1 Location					
1	Lat/Long			GPS		
2	Gat No./Survey No			Revenue map/Interview/ /QGIS	Govt. Official/ Farmer	
	2 Suitability					
1	Depth of Nala	Less than 1.5 m More than 1.5m		VI		Storage capacity
2	Slope of Nala bed (Should be less than 3%)	Steep/moderate/flat		VI/QGIS		Main structure can fail on slope due to excess water pressure on u/s side
3	On sharp curve	y/n		VI/Google earth		Erodes (scouring of sides) side of Nala
4	Order of stream	2 nd /3 rd		VI/QGIS		Should not be done on bigger stream (catchment area should not be more than 1000 hectares)
5	Bed strata / soil type	 Soil Hard rock Can't find Other 		VI	Govt. official	Purpose to fulfill (percolation /storage)
6	Is it gets filled in rainy season	y/n		Interview/ VI	Farmers	Catchment should not be too small than storage capacity
7	How far back water is present	e.g. 100m		Interview/ VI/ Google earth	Farmers	Approximate Storage capacity

7	HeightofBandharaabovebedNalaleveliscorrect or not?	Foundation depth + Height of main body app 3m	VI/Estimates		Structural stability
	A.3 Structural So	oundness			
1	Dimensions of main body	Length Breadth Height (m)	Tape/ laser meter		Approximate Storage capacity & as per estimates
2	Apron presence	y/n	VI		To avoid d/s erosion
3	Freeboard at least 0.3 m	y/n	Таре		To escape surplus water easily
4	Doeswaterenterintoadjoiningfieldsduringmonsoon?	y/n	Interview	Farmer	To check utility of freeboard.
5	D/S slope provided	y/n	VI		Structural stability to resist water pressure
6	Flank wall dimensions	Length Breadth Height	Tape/Laser meter		Protect side banks
7	Leakages at main body	Heavy/light/no/can't figure out	VI/ Interview	Farmers	Cracks in the concrete structure causes leakages, reduces strength and fails
8	Leakages at side walls	Heavy/light/no/can't figure out	VI/ Interview	Farmers	Reduces strength and fails
9	Overall Anchorage of all parts	y/n	 VI		To carry self- load and water load together
10	Silt deposition	Heavy/mild/no	VI/ Interview	Farmers	Reduces water storage capacity
11	Condition of main body	Good/mod/bad	VI/ Interview	Farmers	To check quality

	Strength of main	At left corner – 3		Rebound		Concrete				
12	body	readings at 1m (top)		hammer		grade (mix				
	-	(Bottom) - 3				proportions)				
		At middle $(top) - 3$				defines				
		(bottom) - 3				strength of				
		At right end (top) –				concrete				
		3 (bottom) -3				concrete				
	Strength of	Left and right		Rebound		Strength of				
13	flank wall	Ton 3 readings		hammer		concrete				
	(grade of	Bottom- 3 readings		nammer		concrete				
	(grade 01	Middle 3 readings								
	Excepted coil	windule – 5 leadings		VI		Water flow				
14	Excavaled soll	y/11		V I		water now				
11	is inted with					should not be				
	surrounding the					disturbed and				
	embankment				Г	silted				
15	Are there	y/n		VI/ Interview	Farmer	To check				
15	boulders in the					quality				
	main body									
	A.4 Utility									
	How many					Analyze				
1	month water is	e.g. 1 month		Interview		water				
1	stored				Farmer	availability				
						Analyze				
2	Water present					water				
2	till which month	Name of month		Interview	Farmer	availability				
	Found useful in	,		. .	-					
3	the last dry spell	y/n		Interview	Farmer	Check Utility				
	How many				Farmer/	a.				
4	times it gets	e.g. 2 times		Interview	Govt	Storage				
4	filled				official	capacity				
		Domestic.								
5	Water used for	Irrigation etc.		Interview	Farmer	Utility				
	Is there a well				Govt					
	near by	x/n		Interview	official/	Well				
6	(number if	y/11		merview	forme ar	recharge				
	many)				Tarmer					
	Well water level									
	increased due to			. .	Г	To check				
7	CNB	y/n		Interview	Farmer	utility/Impact				
	construction					• •				

Form 2: Earthen Nala Bund

Da	te: Village	e: Talı	uka:	D	istrict:	Structure C	code:
	Question	Possible options fo answer	r Answer be filled	to	Medium	Whom to ask?	Purpose
A.	1 Location						
	Lat/Long				GPS		
2	Gat No./Survey No				Revenue map/Interview/ /QGIS	Govt. Official/ Farmer	
A. 2	2 Suitability						
1	Nala slope less than 3%	y/n			VI/QGIS		Main structure can fail on slope due to excess water pressure on u/s side
2	Impervious soil strata on site (fine soil or clay)	y/n			VI		Earthen material to stabilize the structure
3	Is it gets filled in rainy season	y/n			Interview/ VI	Farmers	Catchment should not be too small than storage capacity
4	Back water spread provided	y/n			VI		Water should not enter into farms Should not be done on bigger stream (catchment area should not be more than 500
5	Order of stream	$2^{nd}/3^{rd}$			VI/QGIS		hectares)
A.	3 Structural sound	dness					Γ
1	Cross section is trapezoidal	y/n			VI		Stable shape
2	Spillway provided? Is there any	y/n			VI VI/		Excess water to flow without damage To prevent
3	leakage?	y/n			Interview	Farmer	seepage

	Question	Possible	Answer	Medium	Whom	Purpose
	-	options for	Answer to		to ask?	-
		answer	be filled			
	[Core section is					through main
	impervious]					body
		Length				
		Breadth				Storage
4	Dimensions	Depth		Таре		capacity
						To reduce
						permeability
~				X 7 T		and to increase
3	Compaction	Good/bad/mod		VI		stability
						from arosion
6	Pitching on u/s	v/n		VI		and seenage
0	Thennig on u/s	y/11		V1		To prevent
						stored water
						seeping out
7	СОТ	v/n		Interview	Farmer	below the base
		<u> </u>				To provide
				VI/		stability to the
8	Rock toe	y/n		Interview	Farmer	structure
A.	4 Utility	T		I		
	Water present					
	till which	Name of			_	Analyze water
1	month	month		Interview	Farmer	availability
	How many	1 .1		T / ·	г	Analyze water
2	month water is	e.g. 1 month		Interview	Farmer	availability
	Stored Eound useful					
	in the last dry	v/n		Interview	Former	Check Utility
3	spell	y/11		litter vie w	ramer	Check Ounty
-	How many				Farmer/	
	times it gets	e.g. 2 times		Interview	Govt	Storage
4	filled				official	capacity
		DW,		T / ·	г	D
5	Water used for	Irrigation etc.		Interview	Farmer	Purpose
	Is there a well				Cout	
	present near to				official/	Well Recharge
	ENB (number				farmer	wen Reenarge
6	if many)	y/n		Interview		
	Well water					
	increased due				Farmer	To check
_	to ENB	,		.		utility/Impact
7	construction	y/n		Interview		

Form 3: Unlined Farm Pond

Date	: Villa	age: Taluka:	Γ	District:	Structure (Code:
Sr No.	Question	Possible options for answer	Answer to be filled	Medium	Whom to ask?	Purpose
A.1	Location					
	Lat/Long			GPS		
	Gat			Revenue	Govt.	
2	No./Survey			map/Interview/	Official/	
2	No			/QGIS	Farmer	
A.2 \$	Suitability					
	------					Higher side
	Pond					expected (to
	location in	Higher side / lower				recharge lower
1	farm	side of farm		VI		side)
	Pond					Lower than
	elevation					stream elevation
	compared to					expected (to get
	stream	Higher / lower/				filled by stream
2	elevation	same		VI		runoff)
	Type of bed	Black cotton/		VI/		
3	strata soil	/sandy/hard rock		Interview	Farmer	Less percolation
	Farm pond					
	under which	MTS / private /				
4	program?	other		Interview	farmer	
	A .:	3 Structural Soundne	SS			
		Length :				
		Breadth:		Tape/ laser		
1	Dimensions	Depth :		meter		Storage capacity
						Avoid
	Berm					breaching of
2	present	y/n		VI		bund
	Outlet					Allow excess
3	provided	y/n		VI		water to drain
						To protect the
	Maintained					sides of pond to
	Slope of					slide down into
4	pond sides	y/n		VI		the pond.
_	Soil	,			-	Overall stability
5	compacted	y/n		VI/ Interview	Farmer	of pond
	D . 1					Sides sag down
-	Pitching or					into pit and
6	revetment	y/n		VI/ Interview	Farmer	erodes sides

Sr No.	Question	Possible options for answer	Answer to be filled	Medium	Whom to ask?	Purpose				
A.4	A.4 Utility									
	Water									
	present till					To analyze				
	which					Water				
1	month	Name of month		Interview	farmer	availability				
	Is there a									
	well near to									
	pond									
	(number if									
2	many)	y/n		Interview	farmer	Well recharge				
	Well water									
	level									
	increased									
	due to pond					To check				
3	construction	y/n		Interview	farmer	utility/impact				

Form 4: Lined Farm pond

Date	: Villa	Village: Taluka: District:		District:	Structure Code:			
Sr No.	Question	Possible options for answer	Answer to be filled	Medium	Whom to ask?	Purpose		
A.1	Location				_			
1	Lat/Long			GPS				
2	Gat No./Survey			Revenue map/Interview/	Govt. Official/			
A.2 S	No			/QGIS	Farmer			
1	Farm pond under which program	NHM / MTS / private		Interview	farmer			
2	Location of farm pond	In the nala/ on farm		VI/ Interview	farmer	On farm treatment & flow should not obstruct		
3	Plastic cover present?	y/n		VI/ Interview	farmer	Reason if plastic not present (e.g. lack of funds)		
4	Source of water?	well / borewell / tanker etc.		Interview	farmer	Stored water comes from		
5	Where is the stored water lifted/used?	distance in feet		Interview	farmer	Is the water being used in same survey plot or different		
A.3 9	Structural Sou	indness						
1	Dimensions	Length: Breadth: Depth:		Tape/ laser meter		Storage capacity		
2	Berm present	y/n		VI		Avoid breaching of bund		
3	Maintained Slope of pond sides	y/n		VI		To protect the sides of pond to slide down into the pond.		
4	Soil compacted	y/n		VI		Overall stability of pond		
5	Pitching or revetment	y/n		VI		into pit and erodes sides		

Sr No.	Question	Possible options for answer	Answer to be filled	Medium	Whom to ask?	Purpose			
A.4	A.4 Utility								
	How many	y/n		Interview	farmer				
	times farm								
	pond gets								
1	filled?								
	Water	Name of month		Interview	farmer	To analyze			
	present till					Water			
	which					availability			
2	month								
	Farm pond								
	used for					Purpose to			
3	which crop	Crop name		Interview	farmer	fulfill			

Form 5: Loose Boulder Structure/ Gabion Bund

Date:	Village:		Taluka:	Dis	strict: St	rict: Structure Code:			
	Ques	tions	Possible answer	Answer to be filled	Medium	Whom to ask	Purpose		
		A.1 Location			L	L	1		
1	Lat/lo	ong			GPS				
2	Gat No./Survey No				Revenue map/Interview/ /QGIS	Govt. Official/ Farmer			
		A.2 Suitability							
1	Terra more	in slope (not than 20%)	y/n		VI/QGIS		Withstand high velocity water		
2	Order of stream (Catchment area should be less than 10 ha)		1 st or 2 nd		VI/QGIS		Volume of water is subjected with soil/silt it takes with on stream order		
3	Stream width		2 to 10 m		Таре		To understand the construction Coverage on the nala width		
4	Local stones	ly available s for LBS	y/n		VI / Interview	Govt. official/ Interview	For construction		
		A.2 Structural s	oundness						
1	Found	dation width ded	y/n		VI		Stability		
2	Adeq betwe	uate Distance een LBS	y/n		VI/ Tape		After silt deposition the LBS height fills with soil		

	Questions	Possible	Answer	Medium	Whom to	Purpose
		answer	to be		ask	
			filled			1
						and crop
						is possible
	Provision of din in	v/n		VI		Stability
3	the middle	<i>J</i> , 11				
4	If no dip provided,	y/n		VI		Stability
4	are side					
	embankments					
	Dimension	Length		Tape		Verification
5	Dimension	Width		rupe		Vermeution
		Depth				
	Tapered or	y/n		VI		Stable or
6	trapezoidal Shape of					not
	LBS					
	May beight should	x/n		Tana		Withstand
7	he 1 m	y/11		Tape		high
						velocity
						water
_	Arrangement of	Good/ bad		VI		Reduce Soil
8	stones/					erosion
0	Covers entire stream	y/n		VI		Proper
9	width and 1m extra					anchorage
	on both sides.					
	AS. Other					
1	Soil erosion stopped	y/n		VI / Interview		Purpose to
1						fulfill
2	Suggestions					
2						

Form 6: Continuous contour Trenches (CCT)

Date	: Village:	Taluka:	Distri	ct: St	tructure Code	:
	Questions	Possible answer	Answe r to be filled	Mode of data collection	Whom to ask	Purpose
1	Lat/long			GPS		
2	Gat No./Survey No			Revenue map/Intervi ew/ /QGIS	Govt. Official/ Farmer	
A.2	Suitability					
1	Slope	Steep/mild				0-33% slope
2	Distance between trenches	Slope 0-4%- 10m, Slope 4-8% - 8m, Slope 8-15%- 6m, Slope 15- 33%- 4m		VI/TAPE		Greater the slope lesser the distance between trenches
3	Type of trenches	Continuous contour trenches/ Staggered trenches		VI/QGIS		Maximize the runoff harvested by staggered trenches
4	CCT (continuous in length)	y/n		VI/ google earth		Arrest maximum runoff
5	Drainage line passing through trench	y/n		VI/QGIS		Can create gullies
6	Trenches on contour	y/n		VI/ QGIS		water flow can create gullies
A.3	Structural Soundness					
1	Dimensions	Depth Breadth		Tape/ VI		Storage capacity
2	Running Length per Ha	e.g. 1000m per Ha		VI/ Estimates	Govt. Official	Quantity of work as per estimate
2	Berm provided	y/n		VI		Excavated soil should not refill the trench

	Questions	Possible	Answe	Mode of	Whom to	Purpose
		answer	r to be	data	ask	
			filled	collection		
3	Bund is Equal to Trench depth and	y/n		VI		Reduce velocity of
	maintained					runoff water and recharge
						water
	Grass/ small trees	y/n		VI		Bund
4	planted on bund					Protected
						against
						erosion
A.4	Utility					
	Soil erosion reduced	y/n		VI/	Farmer	Purpose to
1				Interview		fulfill
	Water level increased in	y/n		Interview	Farmer	Recharge
2	nearby structure					
3	Suggestions					

Form 7: Stream deepening and widening/Desilting

Da	te: Villa	age: Taluka:	Dist	rict: Stru	acture Cod	le:
	Question	Possible options for answer	Answer to be filled	Medium	Whom to ask?	Purpose
A.	1 Location					
1	Lat/Long			GPS		
2	Gat No./Survey No			Revenue map/Interview/ /QGIS	Govt. Official/ Farmer	
A. 2	2 Suitability					
1	Order of stream	$1^{\text{st}}/2^{\text{nd}}/3^{\text{rd}}.4^{\text{th}}.$		QGIS/VI		$\begin{array}{c} \text{Should} & \text{be} \\ \text{done} & \text{on} \\ 2^{\text{nd}}/3^{\text{rd}} \end{array}$
2	Whether upstream of Bandhara?	y/n		VI		Should be preferred
3	Bed strata / soil type	 Hard rock Soil/Alluvium Can't found other 		VI	Govt. official	Purpose to fulfill (percolation /storage)
4	Whether location certified by Sub- divisional Agriculture office?	y/n		Interview	Govt. official	Should be done
A.	3 Structural So	undness				
1	Dimensions Before Excavation	Length Breadth Height (m)		Tape/ laser meter		Quantity of work as per estimate
2	Dimensions after Excavation	Length Breadth Height (m)		Tape/ laser meter		Quantity of work as per estimate
3	Depth below stream bed?	In m		Tape/ Interview	Govt. official	Less than 3 m or till hard rock
4	Volume of silt excavated?	In m3		Above dimensions/ Estimates		Quantity of work as per estimate
5	Silt Used for?	Farmer/Berm		Interview/ VI	Farmer/ Govt.	Identify beneficiary

	Question	Possible options for answer	Answer to be filled	Medium	Whom to ask?	Purpose
					official	
6	Distance from CNB	In m		Tape/ Laser meter		Should be more than 5 m
7	Soil conservation works in upside of location?	y/n		VI/ Interview	Govt. official	Should be done
8	Berm provided/ maintained	y/n		VI/ Interview	Farmer	Excavated earth should not fall into stream again
	A.4 Utility					
1	How many month water is stored	e.g. 1 month		Interview	Farmer	Know water availability
2	Water present till which month	Name of month		Interview	Farmer	Know water availability
3	Found useful in the last dry spell	y/n		Interview	Farmer	Check Utility
4	How many times it gets filled	e.g. 2 times		Interview	Farmer/ Govt official	Storage capacity
5	Water used for	Domestic, Irrigation etc.		Interview	Farmer	Utility
6	Is there a well near by (number if many) Perceived recharge?	y/n		Interview	Govt official/ farmer	Recharge
7	Well water level increased?	number		Interview	farmer	Check utility/Impact
Form 8: Compartment Bunding(CB)

Date: V		llage: Taluka:	Γ	District:		Structure Code:		
	Question	Possible options for answer	Answer to be filled	Medium	Whom to ask?	Purpose		
A.1	Location		·		·			
1	Lat/Long			GPS				
2	Gat No./Survey No			Revenue map/Interview/ /QGIS	Govt. Official/ Farmer			
A.2	Suitability							
1	Slope of the land	Slope in %		VI/QGIS		Should be between 0-4%		
2	Rainfall	In mm		Interview	Farmer	Should be less than 750 mm		
3	Has CCT been done before?	y/n		VI/ Interview	Govt. Official/ Farmer	Should not be done.		
4	Is it spread? Area affected	y/n, hectare		VI		Should not be spread/ area>50 hectare		
A.3	A.3 Structural Soundness							
1	Dimensions	Length : Top: Bottom: Depth :		Tape/ laser		Cross section Dimensions are as per ground type Heavy		
2	Ground type	Heavy/medium/light		VI		2.25*0.9*0.45 Medium- 2.00*0.85*0.3 Light- 1.8*0.75*0.3		
3	Outlet provided on main bund? PVC pipe- dia?	v/n. inches		VI		30cm above ground and 6- inch diameter		
1	Position of	Correct/incorrect		VI		On main bund at		
5	Is vegetation provided over	y/n		VI		Should be provided over bund.		

	Question	Possible options for	Answer	Medium	Whom	Purpose
		answer	to be		to ask?	
			filled			
	bunding?					
						Main bund
						should be across
	Main bund					the slope and
	and side					side bund along
6	bund.	Across and along		VI		the slope
	Use of					Whole
	excavated					excavated soil
	soil for			VI/		should be used
7	bunding	Total/partial		Interview	Farmer	for bunding.

Form 9: Terracing

Da	ate: Village:	Taluka: Dist		strict:	Structure Code:	
Sr. No	Questions	Possible answer	Answer to be filled	Mode of data Collection	Whom to ask	Purpose
	Location	•			·	
1	Lat/long			GPS		
2	Gat No./Survey No			Revenue map/Interview /	Govt. Official/ Farmer	
	Suitability			QGIS		
1	Slope of the land	e.g. 8%		VI		Slope less than
2	Across a slope (on the contour)	Y/N		VI		
3	Soil depth after terracing	In m		Interview	Farmer	Min 0.15 m
4	Soil type	Pervious/ impervious		VI	Farmer/ Govt. Official	
5	Type of terracing	Broad based Narrow based – ridge side		VI		
	Structural soun	dness			·	
1	Leveling	Y/N		VI		For paddy land
2	Sufficient soil Thickness	Y/N		VI		Min 0.3 m
3	Area	Length Breadth		Таре		To check quantity as per estimate
4	Planted crops	Y/N		Interview /VI	Farmer	Under paddy or another crop
5	Excavated earth deposition	Well/ not well		Interview /VI	Farmer	Used for bund and level farm
6	Excavated soil used to farms	Y/N		Interview	Farmer/ Govt. official	Increase soil thickness
7	Bund is provided	Y/N		VI		Reduce soil erosion
8	Fodder seed on Bunds	Y/N		VI/ Interview	Farmer	To protect bund
9	Outlet provided	Y/N		VI/ Interview	Farmer	Pass excess water
10	Provided bund trapezoidal shape	Yes/ No				Stability

Sr. No	Questions	Possible answer	Answer to be filled	Mode of data Collection	Whom to ask	Purpose
	Utility					
1	Cultivation of paddy	Yes/ No		Interview	Farmer	Purpose to fulfill
2	Name of farmer			Interview	Farmer	
3	Plot no/ gut no.			Interview	Farmer	
4	Crop productivity Increased	Yes/ No		Interview	Farmer	
5	Suggestions					

Form 10: Old paddy land repair

Γ	Date: Village:	Taluka:	Distri	ct: Str	ucture Code:	
	Questions	Possible answer	Answer to be filled	Mode of data collection	Whom to ask	Purpose
	Location					•
1	Lat/Long					
				Revenue	Govt.	
2	Gat No./Survey No			map/Interview/	Official/	
2				/QGIS	Farmer	
	Suitability					
1	Was land under	y/n		Interview	Farmer/	Repair
	paddy				Govt.	should be
	cultivation before?				Official	done on
						paddy field
2	Were bunds 50%	y/n		Interview	Farmer/	50% eroded
	Eroded before the				Govt.	bunds
	repair?				Official	
1	Structural soundnes	5 S		N/I		Ctore 1 and to a
1	Bunds on all sides	y/n		V1		Stored water
						lond
2	Dimensions of bund	Ton-		Tane		Top-0.45m
2	in m	Rottom-		rupe		Bottom-1 8m
		Depth-				Depth-0.68m
3	Condition of bunds/	Good/mod/bad		VI		Ouality of
	maintained					work
4	Crop planted on	y/n		VI/ Interview	Farmer	Maintain
	bund					bund
	Utility					
1	Productivity	y/n/can't say		Interview	Farmer	
	increased					
	A 11111 0	/		T / ·	F	
2	Availability of water	y/n		Interview	Farmer	
3	Suggestions					

Form 11: Sub Surface bund (SSB)

Date:	Village:	Taluka:	Dis	strict: S	tructure Code:	
	Questions	Possible answer	Answer	Mode of data collection	Whom to ask	Purpose
	Location	L				L
1	Lat/long			GPS		
				Revenue		
	Gat No./Survey	r		map/Interview/	Govt. Official/	
2	No			/QGIS	Farmer	
	Suitability			- F	1	
1	30-75cm below	y/n		VI	Farmer	farms are above
	the			/Interview		SSB
2	ground level				Earman	Drinking water
2	In the vicinity of wells/handpump	y/n			Farmer	Drinking water
	wens/nandpump			Interview		strengthening
3	Constructed in	v/n		VI/	Farmer	Make sub surface
-	nala/stream	J''		Interview		flow available
	Structural sound	Iness				
1	Dimensions	Length		Tape/ laser		
	In m	Breadth		meter		
		Depth				
2	Constructed upto	y/n		Interview	Farmer/	Otherwise water
	hard rock				Govt. official	percolates below
3	Perpendicular to	y/n		VI/	Farmer	Obstruct the flow
	direction of flow	5		Interview		
4	Provided boulder	v/n		Interview	Govt.	Percolate surface
	check/recharge	5			official/	flow underground
	trench on u/s				Farmer	
5	Drains on both	y/n		VI/	Farmer	Check percolation
	sides	5		Interview		1
6	Maintained	y/n		VI		Quality of work
	Utility					
1	Increased	y/n		Interview	Farmer	Purpose to fulfill
	Recharge to well					
2	Suggestions					
L						

Form 12: Repair of Cement Nala Bund (CNB)

Date:	Village	: Taluka:	Di	strict: S	structure Co	ode:
	Question	Possible options for answer	Answer to be filled	Medium	Whom to ask?	Purpose
1 Loc	cation					
1	Lat/Long Gat No./Survey			GPS Revenue map/ Interview/	Govt. Official/	Check as per
2 2 Suit	N0 tability	<u>.</u>		QGIS	Tarmer	estimate
1	Objective of repair	Functional performance or leakages/ Durability/ Corrosion/ Increase strength/ Deterioration		Interview	Govt. Official/ farmer	Necessity of repair and to select repair method
2	Repair techniques	Grouting/ Surface Patch / retrofitting/ other		Interview/ VI	Govt. Official/ farmer	Based on objective of repair
A.3 S	tructural Sound	lness				
1	Repaired part	Main body/ Key wall/apron/ Wing wall		Interview/ VI	Govt. Official/ farmer	To check repaired area
2	Dimensions of main body	Length Breadth Height (m)		Tape/ laser meter		Approximate Storage capacity & as per estimates
3	Work done properly	y/n		VI/ Interview	farmer	To check quality
4	Condition after repair work	Good/mod/bad		VI/ Interview	Govt. Official	To check quality

	Question	Possible options	Answer	Medium	Whom	Purpose
		for answer	to be filled		to ask?	
			meu			
A.4 U	J tility	ſ		ſ		Γ
1	Increase in Water storage	M3		VI/ Interview	Govt. Official /Farmer	After repair storage capacity should be increased
2	How many month water is stored	e.g. 1 month		Interview	Farmer	Analyze water availability
3	Water present till which month	Name of month		Interview	Farmer	Analyze water availability
4	Found useful in the last dry spell	y/n		Interview	Farmer	Check Utility
5	How many times it gets filled	e.g. 2 times		Interview	Farmer/ Govt official	Storage capacity
6	Water used for	Domestic, Irrigation etc.		Interview	Farmer	Utility
7	Is there a well near by (number if many)	y/n		Interview	Govt official/ farmer	Well recharge
8	Well water level increased due to repair	y/n		Interview	Farmer	To check utility/Impact

Form 13: Repair of Percolation tank(PT)/Earthen Nala bund (ENB)

	Question	Possibleoptionsforanswer	Answer to be filled	Medium	Whom to ask?	Purpose
1 I	Location					
1 2 2 S 1	Lat/Long Gat No./Survey No Suitability Objective of	Leakages/ Settlement/ Increase		GPS Revenue map/Interview/ /QGIS	Govt. Official/ Farmer Govt. Official/	Check as per stimate
2	repair Repair techniques	stability Other Increase height/ Compaction/ impervious material replacement / Pitching/ other		Interview/ VI	farmer Govt. Official/ farmer	repair Based on objective of repair
A.	3 Structural Sou	ndness				
1	Repaired part	COT/ casing/hearting/ Spillway		Interview/ VI	Govt. Official/ farmer	To check repaired area
2	Cross section is trapezoidal	y/n		VI		Stable shape
3	Spillway provided?	y/n		VI		Excess water to flow without damage
4	Dimensions of	Length		Tape/ laser meter		Approximate

Date:Village:Taluka:District:Structure Code:

	Question	Possibleoptionsforanswer	Answer to be filled	Medium	Whom to ask?	Purpose
	main body	Breadth Height (m)				Storage capacity & verification
5	Work done properly	y/n		VI/ Interview	farmer	To check quality/ purpose to fulfill
6	Condition after repair work	Good/mod/bad		VI/ Interview	Farmer/Govt. Official	To check quality
A.4	4 Utility					
1	Increase in Water storage	M3		VI/ Interview	Govt. Official /Farmer	After repair storage capacity should be increased
2	How many month water is stored	e.g. 1 month		Interview	Farmer	Analyze water availability
3	Water present till which month	Name of month		Interview	Farmer	Analyze water availability
4	Found useful in the last dry spell	y/n		Interview	Farmer	Check Utility
5	How many times it gets filled	e.g. 2 times		Interview	Farmer/ Govt official	Storage capacity
6	Water used for	Domestic, Irrigation etc.		Interview	Farmer	Utility
7	Is there a well near by (number if many)	y/n		Interview	Govt official/ farmer	Well recharge
8	Well water level increased	y/n/can't say		Interview	Farmer	To check utility/Impact

Annexure B2 - Farmer Interview Format

Farmer Name		Contact No.	
Total Land holding (in acres)			
Plot number			
Area (acres)			
Is farmer :	Y/N		

Surveyed plot Details								
Plot No	Plot Size (in acers)			n acers)				
Rain fed/ Irrigated	Rain fed/ Irrigated			Single Season/ Double Season				
Is farmer Beneficiary of JSA Work?		Y/N		If Yes, What Work?				

	Cropping Details (Kharif)												
Year		Cr	op 1		Crop 2								
	Name	Area (in Acres)	Yield (in Q/Acre)	Watering (no. of)	Name	Area (in Acres)	Yield (in Q/Acre)	Watering (no. of)					
2017													
2016													
2015													

	Cropping Details (Rabi)										
Year		Cr	op 1		Crop 2						
	Name	Area (in Acres)	Yield (in Q/Acre)	Watering (no. of)	Name	Area (in Acres)	Yield (in Q/Acre)	Watering (no. of)			
2017											
2016											
2015											

	Cropping Details (Annual Crop)										
NI	A	Year of	Watering	Yield	Was watering						
Iname	Area	on	summer	(kg per acre	e) adequate (Y/N)						
				2017	2017						
				2016	2016						
				2015	2015						

	Irrigation Sources Details												
		Dug-well 1	Dug-well 2	Bore-well 1	Bore-well 2								
Depth (in feet	s)												
No of Hours	2017												
Motor runs in February	2016												
	2015												
New wells/bore wells in last three years (if any)													

Farmer's Perceived Benefit

Effect of JSA Work	Y/N	Remarks
Increase in dug well water level		
Increase in bore well water level		
Increase in soil moisture		
Increase in surface water availability		
If no effect of JSA work, please give reasons in Remarks column		
Remarks about quality of JSA work		

Benefits of JSA works	Y/N	Remarks
Protective irrigation during dry spell		
Increase in kharif Area		
Increase in Kharif Yield		
Increase in Rabi Area		
Increase in Rabi Yield		
Shift towards high income crops		
Can't Say		
Others (Specify):		

Annexure B3- Drinking water assessment formats

Household Water Assessment Form

1	Village	Habitation									
2	Name of Household Ow						Contact	No			
3	Household Size		Male	ale Female					Household	ID	
4	Location (Within Gaonthan-01; In basti (more than 10 households)-02; Scattered					irm-03)			Mark Lat-long		

A4	Drinking Water (Normal Season)												
AL	-		Dimking wa	aer (140mma aes	5011)		-		an cort		0 F.		
Sr.	De	livery po	ounts	Distance	Ownership	Source	Frequency	Estimated	Tantt/	In Case of	Quality		
No	1-	Bottle	Water	1- Within	1- Private	identification	(Number	liters per	Cost	Tanker]	1- Good		
	2-	PWS-1	House	premise	(self)	(in case of	per	day	(Rs per		2- Okay		
		Conne	ction	2- 0-500m	2- Private (others)	Public Asset)	week)		month)	Duration	3- Bad		
	3-	PWS-		3- > 500m	3- Public	[RO Plant				(in Months) and			
		Standp	ost/Cistem			(Public)]				Frequency			
	4-	Bore-v	vell			[PWS-Name]				Per week			
	5-	Well				Community							
	6-	Hand-	pump			Well- Name]							
	7- Tanker		 -			-							
1													
2													
3													
A2			Drinking Wa	ter (Summer Ses	ison)								
Sr.	De	livery po	oints	Distance	Ownership	Source	Frequency	Estimated	Tariff/	[In Case of	Quality		
No	1-	Bottle	Water	1- Within	1- Private	identification	(Number	liters per	Cost	Tanker]	1- Good		
	2-	PWS-1	House	premise	(self)	(in case of	per	day	(Rs per	_	2- Okay		
		Conne	ction	2- 0-500m	2- Private (others)	Public Asset)	week)	-	month)	Duration	3- Bad		
	3-	PWS-		3- > 500m	3- Public	[RO Plant	-		-	(in Months) and			
		Standa	ost/Cistem			(Public)]				Frequency			
	4-	Bore-v	rell			[PWS-Name]				Per week			
	5-	Well				Community							
	6-	Hand-	nump			Well-Namel							
	7. Tankar		rr										
			-										
1													
2													
З													

Household Water Assessment Form

B1	Cattle Water							
Тур	e	Number	Source (in normal months)	Distance	Estimated Quantity (in litres per day)	Source (in summer months)	Distance	Estimated Quantity (in litres per day)
Big	(Cow etc)							
Sma	all (Goat etc)							

A1		Drinking Wa	iter (Last Scarcity	Year)							
Sr.	De	livery points	Distance	Ownership	Source	Frequency	Estimated	Tariff/	[In Case of	Qua	lity
No	1-	Bottle Water	1- Within	1- Private	identification	(Number	liters per	Cost	Tanker]	1	Good
	2-	PWS- House	premise	(self)	(in case of	per	day	(Rs per		2	Okay
	Connection		2- 0-500m	2- Private (others)	Public Asset)	week)		month)	Duration	3- 0	Bad
	3-	PWS-	3- > 500m	3- Public	[RO Plant				(in Months) and		
	Standpost/Cistem			(Public)]				Frequency			
	4-	Bore-well			[PWS-Name]				Per week		
	5-	Well			[Community						
	6-	Hand-pump			Well-Name]						
	7-	Tanker									
1											
2											
3											

Remarks, If any

DW1: Drinking Water Sources Survey

Sr.	Туре	Location	Depth(m)	Diameter	No. of	Distance	Earlier Status	Current
No		Mark-Latitude,		(m)	dependent	from	In	Status
	Open dug-	Longitude,			households	Dependent	Use/Abandoned?	
	well,	Elevation (m)				households	If in use – when	
	shallow tube	(Gaonthan/Other)					dries?	
	well						If abandoned.	
	(handpump),						why	
	deep							
	borewell							
<u> </u>								

Annexure C

Sample Assessment Report (Massa Village)

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1 Introduction

1.1 Overview of Kalamb taluka

Kalamb taluka is the north-central taluka of Osmanabad district of Aurangabad division in Marathwada region. The whole taluka falls in the Manjra sub-basin of Godavari river basin. It is bounded by Kaij taluka of Beed district on the north, Latur taluka of Latur district on the east, Osmanabad taluka on the south and Barshi taluka of Solapur district on the west. The taluka head-quarter, Kalamb town is around 50 kms north of Osmanabad district head-quarter and is situated very close to the northern boundary of the taluka.

Manjra dam river forms the northern boundary of the taluka. Manjra dam is located a few kms east of Kalamb town. The dam is situated very close to the junction of Beed, Latur and Osmanabad districts. The backwater of Manjra dam reaches very close to Kalamb town when the dam is full. Terna river originates in Kalamb taluka which further joins Godavari river to the south-east on the border of Maharashtra and Karnataka in Latur district.

Kalamb taluka falls in the assured rainfall zone of Maharashtra. It receives around 760 mm of annual rainfall from south-west monsoon winds



Figure 1 Massa map

during months of June – September and late rainfall from north-east winds in September – October.

The terrain of the whole taluka is generally flat with small ridges all over the taluka. The mean elevation on the ridges is around 750 masl, while in the flat lands it is around 650-670 masl. The slopes are generally from south-west and south to north-east. The soils around the ridge parts are gravelly sandy while the soils on the flat lands are deep to very deep clayey. There are many sugarcane cooperative factories in the region. Sugarcane is one of the important cash crops. Manjra right canal irrigates the few villages in the north-eastern corner of the taluka.

1.2 About Massa

Massa is situated on Kalamb-Barshi highway to the south-west of Kalamb town at a distance of around 15 km from Kalamb.

The total geographical area of the village is 2440 hectares. The Kalamb-Barshi highway splits the village into eastern and western parts. The gaothan (main habitation) lies in the central part of

the village on the highway. The western, southern and part of the eastern boundaries form ridges. Two main streams drain the village, one on the eastern side of the highway and one on the western side. The streams run south to north. One stream originating in the south-eastern region of the village runs northwards into adjoining village.

Demographics

The population of the village is 4361. The number of households is 955. Around 18% of the population belongs to Scheduled Caste category. There are no scattered vastis or habitations in the village. The whole population is settled in the main habitation except Fartale vasti which is 1 km away in south of the main habitation with around 20 households.

2 Pre-visit-Desk Assessment

2.1 Secondary data analysis

2.1.1 Geo-spatial analysis using GIS platform

Land use-Almost 96% of the total geographical area is cultivable area. The main kharif crop in the village is soyabean and the main rabi crops are green gram (harbhara) and jowar. There are pockets where sugarcane is also grown.

Cropping- Most of the southern, western and eastern region on the ridge area is single cropped area, while the northern part has good amount of double cropped area as well as area under sugarcane. The rabi crops are also taken along the streams in the central part. (ref. MRSAC land use map).

Soil- The soils in the southern, eastern and western regions are gravelly, gravelly clay and gravelly sandy loams and are shallow to very shallow in thickness while the soils in the central and northern regions are deep to very deep clayey soils.



Figure 2: Massa Land use map (MRSAC)

Figure 3: Massa Soil map (MRSAC)

2.1.2 Rainfall

The nearest rain-gauge is Itkur, which lies 6-7 km to the north of Massa. The rainfall of last five years as recorded at Itkur circle is as follows –



Figure 4 Rainfall recorded at Iktur Circle

As seen in the above graph, the rainfall measured at the circle is less than the normal rainfall (680 mm). The years 2014 and 2015 were worst years where the annual rainfall was less than 300 mm. 2016 and 2017 are good rainfall years but rainfall is still less than normal.

2.2 Assessment of JSA village plan

2.2.1 Selection criteria

The village falls under 4 out of 5 categories viz. it in under IWMP with more than 50% works completed, the paisewari was less than 50% at least once in last five years, it has been tanker fed at least once in last five years and it has been declared as a scarcity village in last five years. The criteria used for selection of village in JSA are correct.

Table 1 JSA village selection criteria

Selection criteria	Yes/No
Is the village part of IWMP/IIDP/RIDF/Gatiman Panlot vikas Karyakram/	Yes
Dryland Farming Mission?	
Is the village declared drought affected (production below 50%) this year or has	Yes
been declared at least once in the last five years?	
Is the village tanker-fed or has been tanker fed at least once in last 5 years?	Yes
Has the village been declared as over exploited village/critical/semi-critical?	No
Is the village part of watershed project and has been declared drought affected at	Yes
least once in the last five years?	

2.2.2 Water budget computation

Table 2 Water budget computation

Sr. No.	Description	Details
1	Population	6334
2	Geographical area (Ha)	2463

Sr. No.	Description		Details
3	i) Average Rainfall (mm)		740
	ii) Total rainfall in TCM		18226
4	Total water requirement (a-	+b)	1743.48 TCM
	a) For Drinking		138.26 TCM
	b) For Irrigation		1605.22 TCM
5	Total Runoff as per Strange table		2277.78 TCM
6	Total impounded runoff (c-	+d)	2070.60 TCM
	c) Due to Old works		581.00 TCM
	d) New Proposed works		1489.60 TCM
7	Available runoff (5	5-6)	207.18 TCM
8	Deficit/ surplus (6	5-4)	327.12 TCM

The runoff generated is correctly calculated as per Strange's formula. The runoff is around 12% of the rainfall.

2.2.3 Crop water requirement

The crop water requirement as calculated in the JSA plan is just 1605.22 TCM which comes to be only 8% of the total available rainwater. The kharif cropped area is 86% of the total geographical area. Rabi area is around 36% and area under annual crops and horticulture is around 6%. Considering this cropped area, the crop water requirement as per the JSA plan is too less if compared with total crop evapotranspiration load. The budget in the JSA plan is basically runoff budget and not overall water budget. [This has been corrected in the new JSA plans for 2017-18].

अ.क्र.	क्माचा प्रकर	जुनी क्मे		नविन ज्मे		ए क	
		संबा / हे.	TCM	संबा / हे.	TCM	संबा / हे.	TCM
	सला समतल चर	0	0	0	0	0	0
	ंक्सार्टमेंट बंडींग	640	288	2140	963	2780	1251
	माती नाला बांध	12	36	0	0	12	36
	सिमेंट नाला बांध	17	102	7	70	24	172
	पाझर तलाव	5	100	0	0	5	100
	शेततळे	10	7	18	12.6	28	19.6
	व्छीवेअर	3	48	0	0	3	48
	नालाम्नेलीउम्ब रुदींउम	0	0	37	444	37	444
	ए क	6 87	581	2202	1489.6	2889	2070.6

0	Figure 5	Intervention	table	from	JSA	plan
---	----------	--------------	-------	------	-----	------

90% of the total runoff is proposed to be impounded from the total available runoff generated within the village. This may have impacts on the downstream village.

2.2.4 Intervention and expenditure table

Dont	Interventions	Modifie	d JSA Plan	Expenditure Report Obtained from DSAO		
Dept.	Interventions	No	Amount in Lakhs	No	Amount in Lakhs	
	Compartment bunding	2140	144.24	78/2244	83.27	
A	Farm pond	18	13.81	18	13.81	
Agriculture	CNB Repair	8	5.3	8	5.3	
	Nala Deepening	16	31.14	16	31.14	
	Drip Irrigation	79	51.59	79	51.59	
GSDA	Recharge Shaft	28	7.56	28	7.56	
Water Resources	Desiltation	21	24.5	21	24.5	
MI (WC)	Chain CNB with deepening	7	117.7	7	117.7	
MI (ZP)	K. T. Weir deepening	1	3.6	1	3.6	
ZP/PS	Well Recharge	5	0.73	5	0.73	
	Total		400.17		339.2	

Table 3 Intervention and expenditure table

About Rs. 155 lakhs out of total expenditure of Rs. 338 lakhs (i.e. around 45%) was proposed to be spent on nala-deepening and widening. Of the remaining proposed activities, 45% of the funds are proposed to be spent on compartment bunding. So there is a mix of drainage treatment and area treatment activities.

According to JSA plan the nala-deepening work was supposed to store 444 TCM of water which is too large. The storage added due to new works needs to be carefully entered in the plan because the same figures are used to compute water budget.

There was no mis-match between the interventions proposed in JSA plan and the interventions mentioned in the expenditure report shown in the table:

2.3 Marking locations of interventions (from MRSAC Jalyukt website)



Figure 6 Location of intervention

3 On field Assessment

3.1 Assessment visit schedule

The team visited Massa on the days of 29th, 30th and 31st October 2017. The team consisted of Prof. Milind Sohoni, Mr. Vishal Mishra, Mr. Hemant Belsare, Miss Prajakta Chitale from IIT Bombay and Mr. Venkatesh Panchariya, Chief Minister Fellow posted to WCD. The arrangements for stay were made at Balaji lodge at Kalamb.

Day 1 –

1. Meeting was held at TAO office to brief the concerned government officials (Agriculture, water resource, Minor Irrigation (ZP), Minor irrigation (WC), GSDA etc.) about the agenda and methodology for assessment. All the data regarding estimates, beneficiary farmers list, revenue-map etc. were collected and a detailed visit-plan was decided.

2. Meeting was held in GP office with Sarpanch, few GP members, Gram Sevak, few residents and concerned officials. The objectives and procedure of the assessment, viz., ascertaining the conduct of the JSA works, its utility and quality, the drinking water situation and a special reference to NW&D was explained during the meeting.

3. Visits to intervention sites –i) Farm ponds by agriculture department ii) CNB repair and nala widening and deepening by agriculture department, iii) CNB with widening and deepening by MI (WC), iv) Desiltation work by water resources department with public contribution (*loksahabhaag*) and v) Recharge shaft by GSDA.

Day 2 –

On day-2, we began with the village meeting at the Datta Mandir. This was attended by about 50 people, along with other officers. The team explained the purpose of the assessment and the process which was being followed. Many farmers expressed their demand for more works, esp. those from IWMP which were pending. Given that there had been recent elections, some strong opinions were expressed. On the whole though, the village seemed satisfied with the conduct of the JSA.

Continued with assessment of works -i) Compartment bunding by agriculture department, ii) interviews with various farmers and iii) remaining Farm ponds by agriculture department.

Day 3 –

Continued with assessment of works- i) Remaining compartment bunding as well as farm ponds by agriculture department, ii) CNB repair with widening and deepening of agriculture department, iii) Remaining CNB with widening and deepening by MI (WC).

Assessment of drinking water situation -i) Meeting with Gram Sevak and data collection, ii) Visits to all the wards (*vastis*) and interviews with women, iii) general interviews with farmers, iv) interaction with TAO, KS at TAO office.



Figure 7 Location of visited interventions on recharge priority map

3.2 Drainage line Treatment works

3.2.1 Nala deepening and widening by Agriculture department

Out of the 16 works of nala deepening and widening as per the expenditure report, 5 were assessed. The details of the assessment are provided in the table below. Estimates of the last two assessed works were not provided.

Sr. No.	Estimate Code	Estimated Cost (Rs. In lakhs)	Deepening (m)	Width (m)	Length (m)	Order of stream	Structural soundness	Utility Check
1	MR- 9/111/2A/1	2.99	2.5	18	160	2nd	Ok	Farmer
2	MR- 9/111/2A/4	2.87	2.5	14	200	3rd	Ok	1 well
3	MR-	2.7	2.5	11	240	4th	Ok	1 well

Table	4	NW&D	assessment

Sr.	Estimate	Estimated Cost	Deepening	Width	Length	Order of	Structural	Utility
No.	Code	(Rs. In lakhs)	(m)	(m)	(m)	stream	soundness	Check
	9/111/2A/5							Farmer
4	NA	NA	2.0	12	150	3rd	Not Ok*	2 wells, Farmer
5	NA	NA	2.0	12	150	3rd	Not Ok*	1 wells, Farmer

Structural soundness -

i) Dimensions – Width of streams were measured wherever possible. Length of widening and deepening was visually inspected. Dimensions were matching with the estimates. The depth of excavation was assessed through visual inspection and interviews with farmers nearby. It was not more than 3m.

ii) The streams were straightened in case of last two (as shown in above table) nala-deepening and widening works. No major negative impacts of straightening were observed or reported by farmers.



Figure 8 Nala deepening by Agriculture dept.

Suitability -

The location of nala-deepening / widening works was correctly chosen. The deepening work was done on 3^{rd} and 4^{th} order streams. Slopes in all the cases were adequate. In case of good monsoon year, all the bunds do overflow but in low rainfall year, the downstream bunds do not fill (as reported by the farmers) because of excavation works in the upstream. These impacts were not taken into account while planning for the deepening works.

Utility –

i) New wells were dug by the farmers in the vicinity of the deepening works. The water levels in these wells were just below the ground level as observed during the assessment. The farmers reported that the wells do not dry throughout the summer and attributed it to nala deepening works.

ii) The wells in the vicinity of around 200-300 meters are benefited due to the recharge through nala deepening.

3.2.2 Desiltation activity (Water Resources Department)

Water resources department has done Desiltation work of a major nala which flows in north west direction in the eastern part of the village. In the expenditure report the cost of work has been reported as Rs. 24.5 lakhs whereas the official could produce estimate of only Rs. 8 lakhs. The officer explained that the said discrepancy is due to inclusion of public contribution (lok-sahabhaag) in the work.

No estimates could be acquired of works done under public contribution. Also, there is no account of quantity of excavated silt, number of farmers who benefited from it, amount of diesel burnt in transport of silt etc.



Figure 9 Desiltation by Water Resources dept.

Following are details of the assessed work –

Structural soundness -

The quality of work was found to be good. The excavation was not found to be more than 3m. The berms were in place and there was no obstruction of natural flows to the stream.

Suitability -

The deepening work was done on 4th order stream and was found to be suitable location.

Utility –

Farmers on either side reported that water remains the nala for one or two months longer than before and this helps in retaining the well levels. Also, many farmers reported to have used the removed silt in their farms which has a positive impact on yield.

3.2.3 CNB with Nala deepening (MI- Water Conservation)

Eight new CNBs along with nala-deepening were constructed by MI Water Conservation department. Out of eight, six works were assessed.

Code	Estimated Cost (Rs. In lakhs)	Cost in Lakhs per TCM	Deepening (m)	Width (m)	Length(m)	Suitability	Structural soundness	Utility Check
CNB+ND/WC- 4	17.24	3.83	1	15	150	Ok	Ok	2 Wells
CNB+ND/WC- 1	17.60	4.00	0.5	16	150	Ok	Ok	1 Well, farmer
CNB+ND/WC- 3	15.63	2.98	1	20	150	Ok	Ok	2 Wells, farmer
CNB+ND/WC- 6	16.73	2.23	1.5	15	150	Ok	Ok	2 Wells
CNB+ND/WC- 5	14.78	1.99	1.5	18	150	Ok	Ok	Farmer
CNB+ND/WC- 2	15.54	1.88	1.5	20	150	ok	Not Ok*	1 Well, farmer

Table 5 CNB with NW&D assessment summary

Structural soundness -

All the works were found to be of good quality and matching estimates. In some cases berms were not in place and have collapsed into the stream. There was no obstruction of natural flow into the stream. Excavation was not found to be more than 3m in any work.

CNBs were also structurally sound. All the CNBs passed the hammer test. Dimensions were as



Figure 11 CNB with NW&D work by Water Conservation dept.

Figure 10 : Water logging in the fields due to berms

per estimates.

Berms (In the above table last item- CNB+ND/WC-2), were obstructing the natural flow of small channels from fields into the nala. This resulted in water logging in the fields nearby. Soyabean crop of one interviewed farmer had failed due to water logging

Suitability -

Locations of all CNBs were suitable and were in 3rd or 4th order streams.

Utility –

The farmers on either side reported about the positive impact of deepening on the well levels.

3.2.4 K. T. Weir repair (MI Water Conservation)

In the JSA plan, a K.T. Weir repair was mentioned but at the site it was found that it was Nala deepening and widening work. The quality of work was found to be good and largely as per the estimates. Nearby farmers reported that earlier nala used to get dry by October end but now it remains till March. The silt was removed to the field nearby.

Remark- the gates of K.T Weir were cemented a year ago by villagers themselves.

3.3 Area treatment activities

3.3.1 Compartment bunding (Agriculture)

The planned area under compartment bunding was 2140 Ha. Works in all sampled regions of the village were visited. The work in northern part was found to be good. 4-5 farmers were interviewed in different survey plots.

Also during interaction with villagers, it was clear that there was lot of demand for CB work.

Structural soundness -

Dimensions were measured at different locations and were found as per estimates.

Location and utility -

All the surveyed farmers reported positive impact of work. Farmers reported that soil moisture retention had increased due to compartment bunding. They reported that they need to provide



Figure 12 CB in survey no. 14 (Gat No.)

However substantial part of CB work was found to be done on fallow land in western part of the village. The soil was thin and of poor quality and the CB work was very patchy. This did help in increased percolation of rain water which was

less water to crops (by atleast one irrigation) due to increased soil moisture. The CB work in the southern part was of very good quality and most farmers interviewed reported positive impact.



Figure 13 CB on fallow land existing old CCT

available as groundwater in the downstream regions. The CNBs were overflowing even after 10 days of last rainfall event. The water was clear which meant that these were baseflows i.e. water percolated in the upstream parts where compartment bunding work was done.

3.3.2 Recharge shaft works (GSDA)

A series of recharge shafts (28) have been constructed by GSDA in the stream where naladeepening and widening was implemented by Water Resources Department. Since the stream was full, the shafts could not be seen. However, the estimates were provided and people testified for the construction of shafts.

3.4 Drinking water interventions

The well recharge work mentioned in the JSA plan and also in the expenditure report which was supposed to be done by WSSD, was not implemented.

		Expenditure Report		Visited	Assessment				
Dept.	Interventions	No	Amount in Lakhs	Interventions	Ok	Not Ok			
Agriculture	Compartment bunding	78/2244	83.27	6	6	0			
	Farm pond	18	13.81	6	6	0			
	CNB Repair	8	5.3	3	3	0			
	Nala Deepening	16	31.14	5	3	2			
	Drip Irrigation	79	51.59	-	-	-			
GSDA	Recharge Shaft	28	7.56	*	-	-			
Water Resources	Desiltation	21	24.5	1**	1	0			
MI (WC)	Chain CNB with deepening	7	117.7	6	5	1			
MI (ZP)	K. T. Weir deepening	1	3.6	1	1	0			
ZP/PS	Well Recharge	5	0.73	-	-	-			
Total				28	25	3			

Table 6 Intervention Assessment Summary

* stream was full, the shafts could not be seen

** As work has done on single nala, counted as single work

4 Assessment of Drinking Water situation

Drinking water assessment was done through interactions with villagers in two habitations of Massa. The interactions were carried out on Day 3, with farmers, women and youngsters.



Figure 14 Map with all habitations marked with their names

On Day 2, meeting was held with Gram Sevak. Details of the drinking water supply scheme were noted down.

On Day 3, all vastis in the main habitation viz. Hanuman mandir, Muslim vasti, Maali galli, Bhim nagar, Varpe chowk, Gandhi nagar and Fartale (pardhi) vasti were visited and interviews were conducted with women in all the vastis.

The drinking water supply scheme was implemented around 30 years ago. The source well is located near a percolation tank.

But the source well water level decreases after March and the water supply becomes erratic. Hence a new source well was identified in the neighboring village near a percolation tank constructed under the Bharat Nirman programme but due to land related problems with the farmer in the neighboring village, the scheme is not completely operational.

It was revealed during the visit that people mostly depend on private borewells and their farm wells for drinking water. The quality of water in the borewells was not upto the mark and some households were using RO purifiers at their homes.

The water in public borewells dries in summer months in bad-rainfall years.

The interventions for drinking water source strengthening should have been proposed under JSA.

5 Summary

5.1 JSA planning and process

i)The works under JSA in Massa village were done by following departments -

- Agriculture,
- Minor Irrigation (Water conservation),
- Minor Irrigation (ZP)
- Water Resources Department
- GSDA

i) The coordination between departments was found to be reasonable.

ii) The locations of interventions were marked correctly on the revenue map.

iii) The estimates for only 8 nala-deepening activities of Agriculture department out of 16 were submitted. The remaining 8 were not provided.

iv) The lok-sahabhaag work of nala-deepening had no estimates and no account of how much was excavated and how much was taken by individual farmers.

Officials of all the departments came for site-visits along with all the available estimates and expenditure reports.

5.2 Impact assessment

Massa is a typical village in the Marathwada region with flat terrain, good clayey soils and assured kharif crop due to assured rainfall. But in the last few years there has been uncertainty in the rainfall. In 2014 and 2015, rainfall were less than 300mm.

Also, during good rainfall years, there are frequent and long dry spells which affect productivity of kharif crops.

As per the land use and soil maps of MRSAC, the vulnerable zone of the village lies in the southern, western and eastern ridge area of the village where the soils are gravelly and thin and farmers can only take kharif crops.

Thus, the main problems faced by the village are - i) protection of kharif crops, ii) increase in rabi area, especially in the vulnerable zone and iii) drinking water security, especially in the low rainfall years.

The problems i) and ii) were addressed through JSA.

The compartment bunding works in the ridge area were effective in retaining soil moisture and increased percolation. Many farmers reported increased soil moisture retention due to compartment bunding. While new lands were being brought under cultivation and/or rabi, these could not be solely contributed to compartment bunding.
The nala-deepening works were highly beneficial to farmers in the band of around 200-300m from the stream. Farmers reported increase in yields due to deepening activities. Some farmers reported cropping pattern change due to nala-deepening and due to farm ponds.

The deepening activities would be effective in a drought year when there are few rainfall events and also in the dry spells. The runoff generated is arrested in the deepened pockets and recharges nearby wells till for next 4-5 months. Thus, farmers are able to provide protective irrigation to kharif crops. But in the case the chained deepening activities runoff would not reach the downstream areas during low rainfall years. This needs to be studied further.

Also, there was a farmer who has very innovatively constructed a check-dam on a small stream by his own money. The impact was quite visible in the field and well nearby. Many farmers wanted this type of activity which does not fit JSA norms currently.

We interviewed around 30 beneficiary farmers to understand the impact of JSA works. The impacts were on different accounts like; *well recharge, increase in productivity, increase in crop land/rabi land etc.* Based on impact of JSA works, overall beneficiary's responses were coded in "Yes", "No", "Somewhat"



6 Appendix

6.1 Annexure I - Expenditure Report

	ज ल	तयुक्त शिवार अभियान	अंतर्गत ग	गव निहा	य शिल्ल	क कामाची	निधी मा	गणी	
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6.2 Annexure II - JSA village report



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८. पिकार अ) खरी अ.क्र.	पाणलं - पाणलोग एकदा बालील एकू प हंगामातील पिकाचे नांव १ मुग २ उडिंद	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोषे ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५	हे काय ? ो गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.क्र. ७	गेल्या ५ व गांव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका	वर्षात किमान गय ? हे. क्षेत्र हेक्टर २० ११०		होय
८. पिकार अ) खरी अ.ज्र.	पाणलं - पाणलोग एकदा बालील एकू प हंगामातील पिकाचे नांव २ मुग २ उडिद ३ सोयाबीन	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोर्ष ण क्षेत्र - न पिकांचे एकूण क्षेत्र हेक्टर २५ २५	हे काय ? ो गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.क्र. ७ ८ ८ २	गेल्या ५ व गांव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ	वर्षात किमान गय ? हे. क्षेत्र हेक्टर २० ११०		होय
८. पिकार अ) खरी अ.क्र.	पाणलं - पाणलोग एकदा बालील एकू व हंगामातील पिकाचे नांव रे मुग रे उडिद सोयाबीन र ख.ज्चारी	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोषे ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५ २५५ १३५६ २३८	हे काय ? ो गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.क्र.	गेल्या ५ व गंव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ भईमग	वर्षात किमान गय ? हे. क्षेत्र हेक्टर २० २१० २१० २१०		होय
८. पिकार अ) खरी अ.क्र. ः ः ः ः ः	पाणलं - पाणलोग एकदा बालील एकू प हंगामातील पिकाचे नांव २ मुग २ उंडिद ३ सोवाबीन ४ ख.ज्चारी ४ कापस	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोषे ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५ २२५ २३८६ २३८	हे काय ? 1 गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.क्र. ७ ९ ११	गेल्या ५ व गंव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ भुईमुग बाजरी	वर्षात किमान गय ? हे. क्षेत्र हेक्टर २० २१ २१ २१ २१		होय
८. पिकार अ) खरी अ.ज्ञ.	पाणलं - पाणलोग एकदा बालील एकूर प हंगामातील पिकाचे नांव र मुग २ उडिद ३ सोयाबीन र ख.ज्वारी ६ कापुस ६ तर	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोर्ष ण क्षेत्र - न पिकांचे एकूण क्षेत्र हेक्टर २५ २३८ २३८ २३८ २३८	हे काय ? 1 गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.ज्ञ. ७ ८ ९ १ १ १ १	गेल्या ५ व गांव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ भुईमुग बाजरी कारळे	वर्षात किमान गय ? 1 हे. क्षेत्र हेक्टर २० २० २० २० २० २० २० २० २० २० २० २० २०		होय
८. पिकार अ) खरी अ.क्र. : : : : : : : : : : : : : : : : : : :	पाणलं - पाणलोग एकदा बालील एकू प हंगामातील पिकाचे नांव रे मुग २ उडिंद ३ सोयाबीन र ख.ज्वारी र कापुस बतुर	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोषे ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५ २२५ २२५ २२८ २२८ २८७८	हे काय ? 1 गांव/तसेच 1त केलेली ग 2357 क्षेत्र - अ.क्र. उ. ९ २ १२ १२	गेल्या ५ व गंव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ भुईमुग बाजरी कारळे	वर्षात किमान जय ? हे. क्षेत्र हेक्टर २० २१० २४६ २४६ २४६		होय
८. पिकार अ) खरी अ.क्र. : : : : : : : : : : : : : : : : : : :	पाणलं - पाणलोग एकदा बालील एकू प हंगामातील पिकाचे नांव २ मुग २ उडििद ३ सोवाबीन २ ख.ज्वारी २ कापुस २ तुर ब) रब्बी ह	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोषे ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५ २२५ २२५ २२५ २२५ २२५ १८७८	हे काय ? 1 गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.क्र. ८ ८ ८ ८ ८ १ १ १ १ १	गेल्या ५ व गंव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ भुईमुग बाजरी कारळे प्र -	वर्षात किमान गय ? हे. क्षेत्र हेक्टर २० २० २० २० २० २१ २१ २१ २२ २२ २२ २२ २२ २२	Ť.	होय
८. पिकार अ) खरी अ.ज्ञ. ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः	पाणलं - पाणलोग एकदा बालील एकूर प हंगामातील पिकाचे नांव सोयाबीन ख.ज्वारी कापुस तुर ब) रब्बी ह पिकाचे	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोषे ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५ २३५६ २३५६ २३५६ १२६८ १८७८ हंगामातील पिक क्षेत्र हेक्टर	हे काय ? 1 गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.क्र. ए ए ए ए र र र र र र र र र र र र र र र	गेल्या ५ व गंव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ भुईमुग बाजरी कारळे त्र - पिकाचे	वर्षात किमान गय ? हे. क्षेत्र हेक्टर २० २० २० २० २० २० २० २० २० २० २० २० २०	ह.	होय
८. पिकार अ) खरी अ.क्र. : : : : : : : : : : : : : : : : : : :	पाणलं - पाणलंगे एकदा बालील एकू प हंगामातील पिकाचे नांव र गुर र उडिंद सोयाबीन र ख.ज्वारी र कापुस तुर ब) रब्बी ह पिकाचे नांव	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोषे ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५५ २३५६ २३५ १२५५ १२६ १८७८ हंगामातील पिक क्षेत्र हेक्टर	हे काय ? 1 गांव/तसेच 1त केलेली ग 2357 क्षेत्र - 3.क्र. ८ ८ ८ १२ १२ १२ १२ १२ १२	गेल्या ५ व गंव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ भुईमुग बाजरी कारळे त्र - पिकाचे नांव	वर्षात किमान जय ? हे. क्षेत्र हेक्टर २० २१० २१० २४६ २४६ २४६ २४६ ३९३ ३मेत्र हेक्टर	र ह.	होय
८. पिकार अ) खरी अ.क्र. ः ः ः ः ः ः ः ः ः ः ः ः	पाणलं - पाणलोग एकदा बालील एकू प हंगामातील पिकाचे नांव र मुग र उंडिद सोयाबीन र ख.ज्वारी कापुस द तुर ब) रब्बी ह पिकाचे नांव र कारभरा	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोषे ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५५ १२५६ १८७८ ईगामातील पिक क्षेत्र हेक्टर	हे काय ? 1 गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.क्र. ७ १२ १२ १२ १२ १२	गेल्या ५ व iia आहे क हे. 2124 पिकाचे नांव सज़री बाजरी बाजरी कारळे प्र - पिकाचे नांव करडी	वर्षात किमान गय ? के हे. क्षेत्र हेक्टर २० २० २० २० २० २० २० २० २० २० २० २० २०	ह.	होय
८. पिकार अ) खरी अ.ज्ञ. ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः ः	पाणलं - पाणलोग एकदा बालील एकू प हंगामातील पिकाचे नांव र सोयाबीन र ख.ज्वारी र कापुस तुर ब) रब्बी ह पिकाचे नांव र हारभरा र गहू	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोषे ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५ २३५६ २३५६ २३५६ १८७८ हंगामातील पिक क्षेत्र हेक्टर ३५८ ३५८	हे काय ? 1 गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.क्र. ए १२ १२ १२ १२ अ.क्र.	गेल्या ५ व गंव आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ भुईमुग बाजरी कारळे प्र - पिकाचे नांव करडी मका	वर्षात किमान गय ? हे. क्षेत्र हेक्टर २० २० २० २० २० २० २४ २४ २४ २४ २४ २४ २२ २४ २२ २२ २२ २२ २२	ह.	होय
८. पिकार अ) खरी अ.क्र. : : : : : : : : : : : : : : : : : : :	पाणलं - पाणलंगे एकदा बालील एकूर प हंगामातील पिकाचे नांव र गुर र उडिंद सोयाबीन र ख.ज्वारी र ख.ज्वारी र कापुस तुर ब) रब्बी ह पिकाचे नांव र हारभरा र गहू	ोटातील गाव आ ट मंजूर असलेले तरी टंचाई घोर्ष ण क्षेत्र - 1 पिकांचे एकूण क्षेत्र हेक्टर २५ २३५६ २३५ १८७८ हंगामातील पिक क्षेत्र हेक्टर ३५८ २६	हे काय ? 1 गांव/तसेच त केलेली ग 2357 क्षेत्र - अ.क्र. ७ ८ १ १ १ १ १ १ १ १ १	गेल्या ५ व iia आहे क हे. 2124 पिकाचे नांव सुर्यफुल मका साळ भुईमुग बाजरी कारळे प्र - पिकाचे नांव मका इंतर	वर्षात किमान गय ? क्षेत्र हेक्टर २१० २१० २१० २४६ २४६ २४६ २४६ २४६ २४६ २४६ २४६ २४६ २४६	ह.	होय

	क) उन्हाळी हंगामातील पिकां	चे एकूण क्षेत्र -		10	हे.
अ.क्र.	पिकाचे नांव	क्षेत्र हेक्टर	अ.क्र.	पिकाचे नांव	क्षेत्र हेक्टर
	१ भुईमुग	१०			
	२				
		१०			
	ड) एकूण नगदी पिके क्षेत्र -	90	हे.		
अ.क्र.	पिकाचे नांव	क्षेत्र हेक्टर	अ.क्र.	पिकाचे नांव	क्षेत्र <mark>हे</mark> क्टर
	१ ऊस	90			
	२				
		90			0
	इ) एकूण फळ पिके क्षेत्र -	65.00	he.		
अ.क्र.	पिकाचे नांव	क्षेत्र हेक्टर	अ.क्र.	पिकाचे नांव	क्षेत्र हेक्टर
	१ आंबा	44.00	8	पेरु	१.००
	२ डाळींब	4.00		आवळा	१.००
	३ चिकू	२.००		चिंच	१.००
		62.00			3.00
	ई) एकूण भाजीपाला पिके क्षे	त्र ∙ 31	हे.		
अ.क्र.	पिकाचे नांव	क्षेत्र हेक्टर	अ.क्र.	पिकाचे नांव	क्षेत्र हेक्टर
	१ भाजीपाला	३१			
	२				
		३१			0
	फ) एकूण फुल पिके क्षेत्र -	हे.			
अ.क्र.	पिकाचे नांव	क्षेत्र हेक्टर	अ.क्र.	पिकाचे नांव	क्षेत्र हेक्टर
	१	0	0	0	
	२				
	\$	1			
	१. गावाचा पाण्याचा ताळेबंद अ) पावसापासून मिळणारा ३	गपधाव			
अ.क्र.	पाणलोटाचा प्रकार	क्षेत्र हे	स्ट्रेंज तक्त्याप्रमाणे अपधाव %	मिळणारा प्रती हे. अपधाव TCM	एकूण अपधाव TCM
	१ उतार २० टक्के पेक्षा जास्त	0	0	0	0
	२ उतार ५ ते २० टक्के	0	0	0	0
	३ उतार ५ टक्के पेक्षा कमी	२४६३	१२.९२	०.९२४८	२२७७.७८२
	एकण	53X5	85.65	0.85X4	221919 19

অ) गवाची एकपायान	वी सज (1+2) -TCM ^	I
	1. ापयाच पा पियार	म गती पापी	
बाब	संखा	प्रति दिन लिटर	एकआवश्यक्याप्री
-11 -1	X1-11		TCM
माम्से	6334	55	127.12
जनावरे	822	35	10.50
शेळ्या, मेंढ्या	350	5	0.64
ुक	7506		138.26
	•		
	2. पि	क्साठी पाप्रि	
पिक्चे नांव	के स्व	आवश्यक्माप्रि प्र.हे.TCM	ए्कआवश्यक्पाप्रि TCM
सोयाबीन	१३५६		0
मुग	રષ		0
उडीद	૪૫		0
मका	११०		0
ख.ज्वारी	२३८		0
तूर	११६		0
ख.भुईमुग	२१		0
गहू	४५	३.६०	१६२
हरभरा(जिरायत)	२५८		0
हरभरा(बागायत)	१००	8.60	१८०
र.ज्वारी (जिरायत)	३९०		0
र.ज्वारी (बागायत)	१००	२.४०	२४०
गळीतधान्य करडई	३०		0
ऊस (पाटाने पाणी)	१७	२१.२०	३६०.४
ऊस (ठिबकने पाणी)	yo	૧૦.૦૫	402.4
आंबा (पाटाने पाणी)	१५	२.१४	३२.१
आंबा (ठिबक)	४०	22.0	३५.०४
डাৰ্ळीब -	4.00	22.0	ک\$. ۲
चिकू	२.००	२.१४	४.२८
पेरु	٩.००	22.0	०.८७६
आवळा	१.००	२.१४	२.१४
चिंच	٩.००	0.00	0
कांदा	१३	३.५०	૪५.५
वांगी	9	8.00	३६
पू क	2988		1605.216

अ.क्र.	कमाचा प्रका	3	नुनी कमे	नविन जमे		एक	
		संबा / हे.	TCM	संबा / हे.	TCM	ू संबा / हे.	TCM
	सला समतल चर	0	0	0	0	0	0
	कार्टमेंट बंडींग	640	288	2140	963	2780	1251
	माती नाला बांध	12	36	0	0	12	36
	सिमेंट नाला बांध	17	102	7	70	24	172
	पाझर तलाव	5	100	0	0	5	100
	शेततळे	10	7	18	12.6	28	19.6
	व्छीवेअर	3	48	0	0	3	48
	नालामेलीउम्व रुदींउम	0	0	37	444	37	444
	ए क	687	581	2202	1489.6	2889	2070.
	ड) गवासाठी पाषाचा	ताळेबंद	•				
	1. गवाची एकपाषार्च	ो गरज			1743.48	TCM	
	• पिकसाठी				1605.22	TCM	
	• पिषाचे पाषासाठी				138.26	TCM	
	2. पावसाच्या पाषापा	सून मिळागरा	ए क अपधाव		2277.78	TCM	
	3. जलसंधरएक्मामुळे	रे एक अडविले	ला अपधाव		2070.60	TCM	
	• पुर्वी झालेल्या क्म	ामुळे			581.00	TCM	
	 नवीन प्रस्तावित व 	मामुळे			1489.60	TCM	
	4 झालेल्या जलसंधाराग	क्मामुळे गवाच	वे गरजेच्या		1162.48	TCM	
	तुलनेत जास्त / क्वी						
	5. नविन क्मे झाल्या	नंतर गवाची ग	जि क्वी / जास्त		327.12	TCM	
	6. निव्वळ वाहून जा	गरा अपधाव			207.18	TCM	
	1. हा र	ती घ्यावयाची	मंजुर व नवीन व	मे आप्रिनिधी	तपशील		
	अ) मंज्	र असलेल्या	योजनेंर्तात क्मे पु	र्पकपं	-		
अ.क्र.	कामाचे नांव		कामे संख्या/हेक्टर	उपलब्ध निधी	शासकीय य	ोजनेचे नांव	
				रु.लाख			
0		- TUÌ					-
y 70	पाणलाट व	गम र संसीए	2014-	0.414 0.14			-
স. ব	कपाटमट / ग्रंडः	5 9511	4880	र४४.२४	Qui	ଦ୍ୟା	-
ब. स	खाल सलग समतल	चर/ सलग					-
क. ज	माताच नाला	ବାଧ					-
ड. न	शततळ	নাগ					-
ञ्. र्ह	भाताच लहीन	জাব নাগ	0	-			-
۶ TF	अनगड दगड आर्टन नंध	जाव गम	0	0			-
TP	आपन बह	य जाला जांग	0	0			-
X	खोलीकरण व रुंद	े नाला बाध ोकरणासह					
1							

अ.क्र.	कामाचे नांव	कामे	आवश्यक	शासकीय
		संख्या/हेक्टर	निधी रु.लाख	योजनेचे नांव
	१ पाणलोट कामे			
अ.	कंपार्टमेट /ग्रेडेड बंडींग	0	0	
ब.	खोल सलग समतल चर/ सलग समतल चर	0		
क.	मातीचे नाला बांध	0		
ड.	शेततळे	१८	१३.८१	ृज्वे
इ.	मातीचे लहान बांध	0		
র্দ্ব	अनगड दगडी बांध	0		
দ	गॅबीयन बंधारा	0		
२	नाला बांध खोलीकरण व रुंदीकरणासह	१६	३१.१४	
	साखळी सिमेंट कॉक्रीट नाला बांध खोलीकरण व रुंदीकरणासह	ها	११७.७०	लपा जिप क्छंब
	३ उपलब्ध पाण्याचा कार्यक्षम वापर(ठिबक /	୨୧		
	तुषार सिचन)			ृर्फ्य
	एकूण.	१२०	२१४.२४	

क) अस्तित्वातील जलस्तोत्राची दुरूस्ती व बलकटीकरण करणे गाळ काढणे.

अ.क्र.	कामाचे नांव	कामे	आवश्यक	शासकीय
		संख्या/हेक्टर	निधी रु.लाख	योजनेचे नांव
	सिनाबा/माती नाला बांध दुरुस्ती	٢	५.३	कृषि
	सिनाबा/माती नाला बांध / गाळ काढणे	२१	૨૪.५	यांञीकीकरण
٤	अस्तित्वातील लघु पाटबंधारे संरचनाची (केटी वेअर) / साठवण बंधारा) दुरूस्ती करणे	१	ર.૬	
				लपा जिप क्ठंब
3	 पाझर तलाव / लघुसिंचन तलाव दुरूस्ती, नुतनीकर्न व क्षमता पुनस्थापित करणे 			
	पाझर तलाव / गाव तलाव/साठवण तलाव/शिवकालीन तलाव/ब्रिटीशकालीन तलाव/माती नाला बांधातील गाळ काढणे			
×) ओढा/नाला जोड प्रकल्प राबविणे	0	0	
- -	विहीर/बोअर वेल पुनर्भरण कामे	પ	ڊ <u>ي</u> . ٥	कृषि
6	े पिण्याच्या पाण्याचे स्त्रोत्र बल्ळकटीकरण करणे	२८	૭.५६	
	एकूण	६३	४१.६९	

	ट अणामकीय मंग्लेटने कमलगानी कमो			
	७. अशासकाय संस्यद्वार करावयाचा काम (ग्वाजगी व महकारी मागवर कारगवाने / हेवस्थान मणिव	ो / रस्ट / स्तंग्रसेती	मंग्री/तलकन ह	`
अ क	(खार्गगा प सहकारा साखर फारखान / ५पस्यान सामत) कामाचे नांव	त/ ट्रस्ट/ स्पपसपा कामे	सस्या/परगष्ण ३०, उपलब्ध निधी) शासकीय
51.97.	जगनाज ∶।।ज	पाप संख्या/हेक्टर	<u> </u>	योजनेचे नांव
१	खोल सलग समतल चर खोदणे			<u> </u>
२	नाला खोलीकरण/रुंदीकरण			
'n	अस्तित्वातील लघु पाटबंधारे संरचनाची (केटी वेअर) / साठवण बंधारा) दुरूस्ती करणे			
8	गाळ काढणे (पाझर तलाव / गाव तलाव/साठवण			
	तलाव/शिवकालीन तलाव/ब्रिटीशकालीन तलाव/माती			
	नाला बाध)			
ىر	ओढा/नाला जोड प्रकल्प राबविणे			
ध	पिण्याच्या पाण्याचे स्त्रोत्र बळकटीकरण करणे			
	एकूण	٥	٥	
इ. खाजगी	उद्योग सामाजिक उत्तरदायीत्व निधीतून (CSR) करावय	ाची कामे	-	
अ.क्र.	कामाचे नांव कामे		उपलब्ध निधी	शासकीय
		संख्या/हेक्टर	হ .লাख	योजनेचे नांव
१	खोल सलग समतल चर खोदणे			
२	नाला खोलीकरण/रुंदीकरण	0.00	0.00	CSR
ŝ	अस्तित्वातील लघु पाटबंधारे संरचनाची (केटी वेअर) /			
	साठपण जवारा) युरूस्ता प्ररण			
8	गाळ काढण (पाझर तलाव / गाव तलाव/साठवण जन्मन (णजनप्रदी), जन्मन (जिपीणनप्रदी), जन्मन (गानी			
	तलाव/शिवकालान तलाव/।ब्रटशिकालान तलाव/माता नाला बांध)			
				\square
ىر	आढा/नाला जोड प्रकल्प राबविणे			
ધ	ापण्याच्या पाण्याच स्त्रात्र बल्ळकटोकरण करण 			+
	ίφ ⁿ n	0	0	
5	ानधाचा गांषवारा			
	अ. शासकाय			
	१. मजूरानधा (अ तक्ता)	- रु.	144.24	लाख
	२. आवश्यक ानधा (ब आाण क तक्ता)	रु.	255.93	लाख
5	ब. अशासकीय संस्था कडून उपलब्ध होणारा निधी	रु.	0.00	लाख
2	क. खाजगा उद्यागाकडून (CSR) उपलब्ध होणारा निधी-	रु.	0.00	लाख
	एकुण निधी	रु.	400.17	लाख

	२. पायाभत सर्वेक्षण					
अ.क्र.	રુ ગાવાનુલ રાવવાના	ৰাৰ	अभि	गन		
			अंमल	बजावणी		
			पुर्वीच	ो स्थिती		
१.	पिण्याच्या पाण्याची उपलब	श्वता (स.घ.मी.) व महिने	૨ ૮.	२८ व ७		
				महिने		
:	२ भुजल पाणी पातळी मार्च	२०१५ (मी)		0		
	२ सिंचन क्षेत्र (हेक्टर)			186.00		
2	४ पिक घनता			180.00		
	पिका खालील एकूण क्षेत्र((हे)				
	पिकाखालील निव्वळ क्षेत्र	(हे)				
2	४ पिक घनता		9	० टक्के		
	पिका खालील एकूण क्षेत्र((हे)		2357		
	पिकाखालील निव्वळ क्षेत्र	(हे)		2124		
(फलोत्पादन पिकाखालील 	क्षेत्र(हे)		65.00		
1	६ चारा पिकाखालील क्षेत्र (ह	हे.)		22		
١	९ मुल्यवर्धित वाढ			0		
	८ जमिनीवरील आच्छादन(व	क्ष संवर्धन/लागवड)		-		
				0		
	९ लोकसहभाग	प्रमाणप नी जणी पर्वाणनी नंनर्वप्रान्न प्र	त्र	0	भिन्नम् अधिजन्म	
अंमलबजा जलयुत शि सहाय्यक, आहेत. गा कामे लोक सामाजिक गावात जल ठराव क्र.	प्रमाणित करणेत येते वणीसाठी मोजे - ावार अभियान हाती घ्यावया कृषि पर्यवेक्षक,शाखा अभिय वामध्ये हाती घ्यावयाच्या सव त्सहभागातून हाती घेणेत येण उत्तरदायित्व निधीतुन पुर्ण व त्युक्त शिवार अभियानांतर्गत दि. / / अन	प्रमाणप की, पाणी सर्वासाठी टंचाईमुक्त मब ता जि ची कामे शासन निर्णवात दिलेल्या ग वंता/कनिष्ठ अभिवंता यांनी गावात वं कामासाठी एकूण रु. लाख ार आहेत.उर्वरीत कामे शासकीव नि हरणेची आहे. ा हाती घ्याववाच्या कामाच्या आराख वये मान्यता घेतलेली आहे.	हाराष्ट्र २०१९ अंतर्ग या गावाची सुचनाप्रमाणे सरपंच दि. / /२० । निधीची आवश्यक नेधी/अशासकीय सं बड्यास प्रामसभा	0 नेवड जिल्हा ग्रामपंचायत १४ रोजी शि ना आहे त्यापं ष्याकडील नि	शिवार अभियान समितीने केली सदस्य,तलाटी, : वार फेरी करून की रु. ध्वी/खाजगी उद्य	आहे. गावात प्रामसेवक, कृषि । निश्चीत केली लाख निधीची ोगाकडील
अंमलबजा जलयुत शि सहाय्यक, आहेत. गा कामे लोक सामाजिक गावात जल ठराव क्र. दि.	प्रमाणित करणेत येते वणीसाठी मोजे - ावार अभियान हाती घ्यावया कृषि पर्यवेक्षक,शाखा अभिव वामध्ये हाती घ्यावयाच्या सव त्सहभागातून हाती घेणेत येण उत्तरदायित्व निधीतुन पुर्ण व नयुक्त शिवार अभियानांतर्गत दि. / / अन	प्रमाणप को, पाणी सर्वासाठी टंचाईमुक्त म ता जि ची कामे शासन निर्णवात दिलेल्या तंता/कनिष्ठ अभिवंता यांनी गावात वं कामासाठी एकूण रु. लाख त कामासाठी एकूण रु. लाख त आहेत.उर्वरीत कामे शासकीय कि रुरणेची आहे. त हाती घ्यावयाच्या कामाच्या आराख वये मान्यता घेतलेली आहे.	त्र वा गावाची सुचनाप्रमाणे सरपंच दि. / /२० । निधीची आवश्यक नेधी/अशासकीय सं बड्यास ग्रामसभा	0 त जलयुक्त नेवड जिल्हा प्रामपंचायत १४ रोजी शि (श्व रोजी श्व रोजी श्व रोजी (श्व रोजी श्व रोजी श्व रोजी) (श्व रोजी श्व रोजी श्व रोजी) (श्व रोजी श्व रोजी) (श्व रोजी श्व रोजी) (श्व रोजी रोजी) (श्व रोजी श्व रोजी) (श्व रोजी	शिवार अभियान समितीने केली सदस्य,तलाठी, स्वर फेरी करून की रु. भ्वी/खाजगी उद्य	आहे. गावात प्रामसेवक, कृषि । निश्चीत केली लाख निधीची ोगाकडील
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		जलयुक्त शिवार अभिय	पान अंतर्ग	त गव नि	हाय शिल	लक्क्माची वि	नेधी माग
	तालुक	फ्रंब					
अक	गवाचे नाव	क्माचा प्रकर	यंत्रणा	एकको	प्रत्यक्ष्पुर्ग झालेली क्मे	प्रत्यक्षत पुग् झालेल्या क्मांची टकेकारी	झालेला र्ा छ
१	मस्सा खं.	कंपार्टमेंट बंडीग (हेक्टर)	र्गेष-विभाष्ट	७८	১৩	१००	८३.२७
२		सलग समतल चर (हे)	र्ज्ष-विभाष्ट				
२		माती नालाबांध (संख्या)	र्जध-विभाष्ट				
8		अनघड दगडी बांध (संख्या)	र्जेष-विभाष्ट				
ų		गॅबियन स्ट्रकचर (संख्या)	र्ज्ष-विभाष्ट				
६		खोल स.स.चर (हे)	र्ज्ष-विभाष्ट				
৩		अर्दन स्ट्रचर (संख्या)	र्जेष-विभाष्ट				
٢		लुज बोल्डर स्ट्रकचर	र्ज्ध-विभाष्ट				
9		माती नालाबांध दुरुस्ती	र्ज्ध-विभाष्ट				
१०		ढाळीचे बांध	र्ज्ध-विभाष्ट				
११		बांध बंधीस्ती	र्ज्ष-विभाष्ट				
१२		शेततळे (संख्या)	र्क्ष-विभाष्ट	१८	१८	१००	१३.८१
१३		साखळी सिमेंट बंधारा	लपाजिप/ स्था स्तर	७	৬	१००	११७.७
१४		सिमेंट बंधारा दुरुस्ती	र्ग्ध-विभाष्ट	٢	٢	१००	५.३
<u></u> શ્ૡ		नाला खोलीकरण/सरळीकरण	ক্ষ-বিभাচ	१६	१६	१००	३१.१४
१६		पाझर तलाव	0				
<i>१</i> ७		पाझर तलाव दुरुस्ती	लपाजिप				
१८		केटी वेअर	0				
१९		केटी वेअर दुरुस्ती	लपाजिप	१	१	१००	ર.૬
२०		सिंचन तलाव दुरुस्ती	0				
२१		कालवा दुरुस्ती	0				
२२		सिंचन विहीर	0				
२३		विहीर पुर्नभरण	प.स./जि.प.	لم	પ	१००	०.७३

२४	बोअरवेल पुर्नभरण	0				
રષ	पुर्नभरण चर	0				
२६	रिचार्ज शाप्ट	भु.जल.स.य.	२८	२८	१००	૭.५૬
રહ	गाळ काढणे शासकीय	0	२१	२१	१००	૨૪.५
૨૮	गाळ काढणे सहभाग	0				
२९	वृक्ष लागवड	प.स./जि.प./सा .वनिज्ह				
३०	रोपवाटीका					
३१	ठिबक सिंचन	र्ष्ध-विभाष्ट	७९	७९	१००	
३२	तुषार सिंचन					
३३	गाळ काढणे सहभागइंध-ा					
	एकूण		२६१	२६१	१००	३३९.२०

6.3 Annexure III – GW Priority Recharge map



6.4 Annexure IV - Photos from field visit



Figure 15 Meeting with officers at TAO office, Kalamb



Figure 16 Meeting with Massa villagers



Figure 17 Beneficiary farmer interview



Figure 18 Farm pond (NHM scheme-44X44X3 m)



Figure 19 New well near CNB, SDM madam visited



Figure 20 Compartment bunding work



Figure 21 Compartment bunding work- southern part of village



Figure 22 On field location verification



Figure 23 CNB with NW&D