The Final Report of

“JSA assessment training program”

under

Unnat Maharashtra Abhiyan (UMA)

Prepared by

Technology and Development Solutions Cell

Centre for Technology Alternatives for Rural Areas

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Executive Summary

This report is an outcome of a 4-month long project of training engineering colleges in the state of Maharashtra on the assessment of Jalyukt Shivar Abhiyan (JSA). This project was done by TDSC, CTARA (IIT Bombay) under Unnat Maharashtra Abhiyan (UMA) and was sponsored by Soil and Water Conservation Department, GoM. The objective of the project was to build the capacities of local engineering college faculty and students in watershed planning, including assessment and evaluation of Jalyukt Shivar Abhiyan.

JSA is a flagship watershed management program of the state government with an objective to ensure year round availability of water for Irrigation and household requirement in all the villages of the state. The program has an integral component of mandatory assessment of all the works in the JSA villages by Third-Party Agencies. Usually, theses assessment exercises are carried out by NGOs or other similar agencies present in the state. However, number of such good quality professional agencies is limited and there are thousands of villages (>25,000) to be assessed. Hence, there is clearly an unmet demand for Third- Party Agencies in the state to do the assessment and evaluation studies for JSA villages.

In this context, UMA, which is another important program of the state government, conceived this project to build the capacities of local engineering colleges so that the colleges can work as Third-Party Agencies. This is also in-line with the stated mission of UMA, which envisions creating a trusted network of local Higher Educational Institutions which are involved in the broader development process as a partner of the state government. The project idea was mooted to the WCD, GoM, and recognizing the potential of the project, the department readily agreed to provide all the necessary liasoning support and also the financials needed. The execution of the said project was entrusted to the TDSC, IIT Bombay which is a research and consultancy arm of CTARA, IIT Bombay. The TDSC, under supervision of UMA curated a 4-month long structured training program. The program included (i) an induction workshop followed by (ii) a 4-month long actual assessment period and finally (iii) a follow-up workshop. An invitation for the training program was sent to all UMA colleges. Around 17 engineering colleges from all parts of Maharashtra showed interest to the invitation and each college identified two faculties and two students for the training program.

As a first step to the program, a google drive was created and shared with all the participants, which had all the necessary information, training materials and formats of data sets required for

the assessment work. Each college was paired with one nearby taluka and was asked to identify 3-4 villages in consultation with the district and taluka administration. Meanwhile, the district administration was instructed separately by WCD to provide all the necessary cooperation to the colleges and provide them required data. Thus armed with the required data and information the college teams arrived for the induction workshop on the 5th February in PRMIT, Amravati.

The workshop was inaugurated by Secretary, WCD, GoM in the presence of District Collector, Amravati and other dignitaries. The workshop ran for two days and included many modules on agriculture, water budget, water conservation structures, basics of assessment and evaluation and a hands-on practice session in GIS. The participants were sensitized for the field work and were told about Do's and Don'ts during the assessment exercise. The colleges did the assessment of JSA works in the chosen villages for the next four months. The TDSC project team provided all the hand-holding and necessary support, whenever its assistance was sought by any college during the assessment period. Most of the colleges submitted the draft assessment report in time.

Finally, a two day follow-up workshop was organised on 5th -6th July in MIT, Aurangabad. The program was graced by District Collector, Aurangabad and Director General, WALMI among many other dignitaries. Many colleges made a presentation about their experience of the assessment task and the assessment outcomes. The colleges were provided with feedback on their assessment work by the project team. Among many other things, future scope assessment studies and possibility of research in agriculture and watershed management was also discussed. One more important thing which came up during the discussion was creating a working group of college faculties in these sectors and many of the colleges committed to it. The colleges were given some more time to incorporate the inputs provided during the workshop and submit the final report.

In the last step, all the college reports were evaluated against a set of weighted parameters. The colleges were categorised in four groups based on their performance in the assessment exercise. Finally, the top two categories which included nine colleges were suggested to UMA for recommendation to WCD as Third-Party Agencies for JSA assessment.

This document contains a report on the JSA training program and two reports on the workshops held during the training program.

Contents

1. Introduction

A 4-month long project was carried out for training of engineering colleges in the state of Maharashtra on the assessment of Jalyukt Shivar Abhiyan (JSA). This project was done by TDSC, CTARA (IIT Bombay) under Unnat Maharashtra Abhiyan (UMA) and was sponsored by Soil and Water Conservation Department, GoM. The objective of the project was to build the capacities of local engineering college faculty and students in watershed planning, including planning and assessment of Jalyukt Shivar Abhiyan.

1.1.Background of JSA and UMA

Increasing agricultural and drinking water stresses have been observed in last few decades due to uneven, unpredictable, and intermittent rainfall. One of the ways to mitigate this situation is to adopt watershed management practice through soil and water conservation activities. Therefore, many line departments of the state government have started a number of schemes towards this end from time to time. However, a lack of coordination among the departments has resulted in poor outcomes of these efforts. Therefore, in order to converse all the efforts, the government of Maharashtra had launched Jalyukt Shivar Abhiyan (JSA) on 5th December 2014.

JSA is a watershed management program to mitigate drought like situation for 25000 villages of the state in five years. The prime objective of the scheme is to ensure year round availability of water for Irrigation and household requirement. In JSA, various soil and water conservation measures like afforestation, compartment bunding, continuous contour trenching, loose boulder structures, cement nala bunds etc. are carried out. The program made a significant departure from previous programs as the planning was to be done at the village level. Therefore, at first a village water budget has to be computed considering the demand and supply and then the required measures have to be planned accordingly. The village plan has to be prepared in consultation of all stakeholders and then it has to be approved in the gramsabha before the commencement of works. Among many other innovations brought in by JSA in watershed management, one important thing has been use of village level map for deciding the type and location of various measures based on geo-hydrologic considerations.

However, for successful implementation of any program monitoring and assessment becomes an important aspect. Therefore, the program has a mandatory requirement of assessment of all the JSA villages by Third-Party Agencies. Usually, these assessment exercises are carried out by NGOs or other similar agencies present in the state. However, number of such good quality professional agencies is limited and there are thousands of villages (>25,000) to be assessed. Hence, there is clearly an unmet demand for Third- Party Agencies in the state to do the assessment and evaluation studies for JSA villages.

Unnat Maharashtra Abhiyan (UMA) is a program of government of Maharashtra to involve local Higher Education Institutes (HEIs) in the broader development process of the state. It has created a network of around 30 institutes across all over Maharashtra which work in development sectors like *sheti, paani, sadak, bijli etc.* UMA regularly organizes training workshops to orient these colleges and develop capacity for working in these areas. One important focus of UMA is assessment and evaluation studies of government programs in these sectors. And hence, training for the same is one of the core objectives of UMA.

In the above context, UMA conceived a project to build the capacities of local engineering colleges so that the colleges can work as Third-Party Agencies. The project idea was mooted to the WCD, GoM, and recognizing the potential of the project, the department readily agreed to provide all the necessary liasoning support and also the financials needed. The execution of the said project was entrusted to the TDSC, IIT Bombay which is a research and consultancy arm of CTARA, IIT Bombay.

2. Salient Features of the JSA training program

This section provides salient features of the JSA training program.

The TDSC, under supervision of UMA curated a 4-month long structured training program. The program was divided into three phases-

(a) A preparation phase which started with necessary preparation for the project and culminated with an induction workshop for the participants from selected colleges.

(b) Assessment phase which was a 4-month long actual assessment period in which colleges were required to do the actual assessment work.

(c) A follow-up workshop in which the colleges presented their assessment work and discussion for future work was done.

2.1.Preparation Phase and Induction Workshop:

As a first step of program, an invitation for the training program was sent to all UMA colleges. Around 17 engineering colleges from all parts of Maharashtra showed interest to the invitation and each college identified two faculties and two students for the training program. A google drive was created and shared with all the participants, which had all the necessary information, training materials and formats of data sets required for the assessment work. Each college was paired with one nearby taluka and was asked to identify 3-4 villages in consultation with the district and taluka administration. Meanwhile, the district administration was instructed separately by WCD to provide all the necessary cooperation to the colleges and provide them required data. Thus armed with the required data and information the college teams arrived for the induction workshop on the 4^{th}-5^{th} February in PRMIT, Amravati. The workshop was inaugurated by Secretary, WCD, GoM in the presence of District Collector, Amravati and other dignitaries. The workshop ran for two days and included many modules on agriculture, water budget, water conservation structures, basics of assessment and evaluation and a hands-on practice session in GIS. The participants were sensitized for the field work and were told about Do's and Don'ts during the assessment exercise. A detailed report on the workshop is attached in the appendix (i).

2.2.Assessment Phase:

The colleges did the assessment of JSA works in the chosen villages for the next four months. The first step for the assessment was to acquire all the relevant data and information from the line departments involved in the execution of JSA. The colleges were given necessary formats for the collection of data which included, JSA village plan, rainfall data, cropping pattern data, estimates of civil works done etc. In the next step, the colleges had to do pre-desk assessment of the village plan especially to scrutiny the water budget and financials. Then the assessment team had to contact village level officials and people representatives and fix the schedule for village visit.

The assessment team was required to hold a village meeting in order to explain the objectives of assessment and to seek their cooperation. Then the team had to inspect and assess every JSA work following the guidelines prepared by the TDSC for the same. All the JSA works were to be assessed on three parameters namely, *Location, Quality and Utility.* The beneficiary farmers

were identified and interviewed to ascertain the utility of JSA works. A special emphasis was given to drinking and household requirement of water and its connection with the JSA works in the village.

Finally, the preliminary findings were to be conveyed to the villagers. The TDSC project team provided all the hand-holding and necessary support, whenever its assistance was sought by any college during the assessment period. Most of the colleges submitted the draft assessment report in time.

2.3.Follow-up Workshop:

Finally, a two day follow-up workshop was organized on 5th -6th July in MIT, Aurangabad. The program was graced by District Collector, Aurangabad and Director General, WALMI among many other dignitaries. Many colleges made a presentation about their experience of the assessment task and the assessment outcomes. The colleges were provided with feedback on their assessment work by the project team. The colleges were given some time to incorporate the inputs provided during the workshop and submit the final report.

The details of the workshop are provided in the Appendix (ii).

3. Recommendation and Future Work

3.1.Evaluation of Colleges and recommendation

All the college reports were evaluated against a set of weighted parameters. The list of parameters is shown in the table below.

Table A1: Key parameters used for performance evaluation

Section	Parameters	Max Marks
Introduction	Location map	2
	Terrain details	6
	Demographic details	2
Sub-total		10
Pre desk Assessment	Geospatial analysis using QGIS	5
	Rainfall Analysis & Selection criteria	2
	Water Balance Table calculation	12
	Intervention and Expenditure report	5

	Marking locations of interventions (MRSAC)	2
Sub-total		26
On field Assessment	Map showing visited structure	4
	Drain line treatment	18
	Area Treatment	18
Sub-total		40
DW situation Analysis	Source Identification	2
	Assessment of Intervention	5
	Quality of water	2
	Availability	5
Sub-total		14
Summary and quality of report writing and documentation		10
Grand Total	Score	100

The colleges were categorised in to four groups based on their score as per their performance in the assessment work. The performance of individual colleges can be seen in the table below.

Table A2: Performance of colleges based on key parameters

Sr. No.	Institute name	List of assessment villages	Score (%)	Category
1	Gharda Institute Of Technology, Ratnagiri A/P - Lavel, Tal - Khed, District - Ratnagiri. - 415 708.	Ketaki Tal – Chiplun	85	Category A
2	Marathwada Institute of Technology, Aurangabad Beed Bypass Road, Satara Village Road, Aurangabad – 431028	Ambegaon Tal – Gangapur	83	
3	Prof. Ram Meghe Institute of Technology & Research, Badnera, Amravati Anjangaon Bari Road, Badnera, Amravati – 444701	Jawara, Lohagaon, Wadhona Ramnath Tal- Nandgaon khandeshwar	77	Category B
4	Sardar Patel College of Engineering, Andheri Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai, - 400058	Olman Tal- Karjat	76	
5	Department of Technology, Shivaji University, Kolhapur Vidya Nagar, Dist. Kolhapur - 416004	Kaneriwadi, Bhuyewadi, Sangavade Tal – Karvir	74	
6	Government Polytechnic , Amravati Gadge Nagar, Amravati - 444603	Yawal Shahid, Bhankheda Tal -Amravati	69	

Sr. No.	Institute name	List of assessment villages	Score (%)	Category
7	Tatyasaheb Kore Institute of Engineering & Technology, Warnanagar Warananagar, Tal. Panhala, Dist. Kolhapur - 416113	Parkhande, Shitur, Sonavade Tal – Shahuwadi	69	
8	SSVPS Bapusaheb Shivajirao Deore College of Engineering, Dhule Vidyanagri, Deopur, Dhule - 424005	Lamkani Tal – Dhule	67	
9	Amrutvahini College of Engineering, Sangamner Near Pune-Nashik Highway, Dist. Ahmednagar, Sangamner – 422608	Karhe Tal – Sangamner	65	
10	Bharati Vidyapeeth Deemed University College of Engineering, Pune Pune-Satara Road, Dhankawadi, Pune – 411043	Bhongalwadi Tal –Bhor	48	Category C
11	Kolhapur Institte of Technology's College of Engineering, Kolhapur Gokul Shirgaon, Kolhapur – 416234	Devthane Tal –Panhala	29	
12	Shri Vithal Education & Research Institute College of Engineering, Pandharpur P.B. No. 54, Pandharpur, Ranjani Road, Dist. Solapur - 413304	Ranzani Tal -Pandharpur	28	
13	Karmaveer Bhaurao Patil College of Engineering, Satara Camp Area, Sadar Bazar, Satara – 415001	Anpatwadi Tal - Man	10	
14	Padmabhooshan Vasantraodada Patil Institute of Technology, Budhgaon Budhgaon, Tasgaon Rd., Tal. Miraj, Dist. Sangli - 416304	Tal- Kavthe Mahakal	0	Category D
15	D. Y. Patil College of Engineering and Technology, Kolhapur Kasaba Bawada, Kolhapur - 416006	Tal- Hatkanangale	0	
16	Government Polytechnic ,Yavatmal Dhamangaon road naringe nagar, Yavatmal - 445001	Tal- Yavatmal	0	
17	Government Polytechnic , Khamgaon Jalamb Road, Vitthal Nagar, Khamgaon - 444312	Tal- Khamgaon	0	

The description of each category and the recommendations of the TDSC training team are as follows:

Category A: (Recommended, scored more than 80% marks)

- These colleges did excellent work.
- These colleges have capacity to carry out assessments and can be considered for empanelment as Third-Party Agencies.

- These colleges have the potential to become regional knowledge centres; they have committed support for an inter-disciplinary Technology and Development Cell (TDC) for an extended period.

Category B: (Recommended, scored more than 60% but less than 80% marks)

- These colleges did good work.
- These colleges have capacity to carry out assessments and can be considered for empanelment as Third-Party Agencies.
- These colleges have the potential to become regional knowledge centres in the long run with proper training support.

Category C: (Not-Recommended, scored less than 60% marks)

- These colleges did satisfactory work. However, they need to improve in pre- visit desk assessment and report writing
- These colleges may require more training on how to conduct assessments and report the assessment of case studies.

Category D: (Not-Recommended)

- These colleges performed below average in the programme and did unsatisfactory work in terms of all parameters. Active participation of these colleges is needed in UMA programme and these colleges require more training.

Finally, the top two categories which included nine colleges were suggested to UMA for recommendation to WCD to be empanelled as Third-Party Agencies for JSA assessment.

3.2. Future Work

The colleges took a keen interest in the training assignment and have committed to work in the sector and undertake research and training, provided a suitable platform is available

Among many other things, future scope of assessment studies and possibility of research in agriculture and watershed management was also discussed during the follow-up workshop. One important thing which came up during the discussion was creating a working group of college faculties in these sectors and many of the colleges committed to it.

Many colleges expressed their interest and priority areas in which they would be working in coming future.

A list of such priority areas is shown in the table below-

College	Tentative Project Area
GIT, Ratnagiri	Assessment of Jalykt Shivar Abhiyan (JSA) and Rural Water Supply
Government Polytechnic, Amravati	Assessment of JSA
PRMITR, Amravati	Assessment of JSA and Demand based crop water requirement and management.
MIT, Amravati	Assessment of RWS
DoT, Kolhapur	Assessment of JYS and Galmukt Dharan, Galyukt Shivar
SVERI, Pandharpur	Reuse of WW for agriculture, Design of low cost testing kit for potable water, Assessment of JSA and RWS
AVCOE, Sangamner	Assessment of JYS and Jam watershed stress assessment
SSVPS BSD COE, Dhule	Assessment of Ashram School and Galmukt Dharan, Galyukt Shivar
Government Polytechnic, Auranagabad	Assessment of JSA

Also, some of the broader suggestions received by the colleges are enlisted below-

1. An Audit Course is needed to be introduced in the regular curriculum by the university so that students can get more time for such activities.
2. Webinar should be conducted by the IITB on regular intervals on related topics.
3. Special request from polytechnic colleges - Provision of separate head for TA/DA for field visits by the colleges.
4. A 2-3 days detailed training on QGIS is required.

Finally, it was decided that WCD would be requested to empanel the colleges as Third-Party agencies and to issue a GR with clear guidance on how to conduct the assessment and evaluation exercises. Also, to harmonize the assessment and evaluation work across the Maharashtra, UMA would be happy to work with WCD to carry out any changes/modifications to the assessment guideline. UMA would also provide the department with a network of trusted institutions for other assignments and applied research.

Report of

“JSA Assessment Induction Workshop”

under Unnat Maharashtra Abhiyan (UMA)

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1. Background on Jalyukta Shivar Abhiyan (JSA) and UMA

Increasing agricultural and drinking water stresses have been observed in last few decades due to uneven, unpredictable, and intermittent rainfall. There are 188 Talukas (2234 villages) where level of groundwater has dropped for more than 2 Metre in the year 2014. As possible solution many programmes like Mahatma Phule water and land conservation campaign in the state, Jalyukta Gaav campaign in Pune division have been implemented before and have helped to permanently overcome drought situation.

Considering results of all these projects, the government was thought of preparing organised action plan to make 'water for all - drought-free Maharashtra to overcome drought situation and implementing 'Jalyukta Shivar Abhiyan' to increase water availability.

The Maharashtra government in India had launched a water conservation scheme named Jalyukt Shivar Abhiyan and first government resolution was circulated on 5th December, 2014 to make water available for assured farming and drinking water by strategically designed and implemented in integrated manner with coordination of all departments. The programme aims to make 5000 villages free of water scarcity every year and bring water empowerment to 25,000 drought-affected villages in Maharashtra upto 2019.

The interventions to be proposed under this programme and the funds required will be used from already existing programmes like IWMP, Mahatma Gandhi National Rural Guarantee Scheme (MGNREGS), Mahatma Phule Jal Bhoomi Abhiyan, National Horticulture Mission and so on. JYS promotes an integration and coordination between various government agencies, programmes during planning and implementation levels and stresses on people's participation.

Under, the leadership of Shri. Eknath Dawale (IAS), Secretary, S&WC the department is moving towards the objectives set by the government under various programs especially JSA being the flagship program of Hon. Chief Minister of Maharashtra. 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. The Water Conservation Department is experimenting with local institutional arrangements aimed at improving sectoral performance, through Unnat Maharashtra Abhiyan (UMA).

UMA is a program under Higher and Technical Education, Government of Maharashtra. It is administered by an Advisory Committee, under the chairmanship of a nominee of Head CTARA, IIT Bombay. UMA seeks to build an independent knowledge infrastructure in the public domain for the state of Maharashtra which will bring socio-economic and cultural development for its people, especially those at the bottom 80% of the socio-economic strata. UMA is currently being rolled out in 31 engineering colleges across the state through a set of enabling Government Resolutions (GRs).

An important mechanism for UMA is to convert typical problem areas into case-studies and to train faculty members and students, through training programs and workshops, to undertake similar studies. So far over 100 faculty members and 100 students have been trained in various development sectors. These workshops are done in partnership with development agencies and each college is paired up with a village/scheme/location, as the need may be, and has access to all documents, maps and stakeholders.

Within this framework, TDSC, CTARA in collaboration with Soil and Water Conservation Department, GoM held a two-day workshop on 4th and 5th February 2018 at PRMITR Amravati to train teachers and students from 14 UMA colleges and 3 government polytechnics in carrying out an assessment of Jal Yukta Shivar Abhiyan villages. Each college was allotted 3-4 villages in a taluka in their vicinity.

The programme has three phases:

1. An initial training phase in which participants will be sensitized by resource persons of CTARA on watershed practices and assessment of JSA scheme constitutes water and soil retention works.
2. A field component where participants will be asked to carry out assessment of completed JSA works in Maharashtra with scientific and technical inputs from the project team consisting of researchers from CTARA.
3. A second round of training where participants will present outputs of the assessment and feedback will be provided to them on the areas of improvement.

This report presents the proceedings of the first round of the training program.

2. Objectives:

The overall objective of the first round of training programme was to build the capacities of engineering college teachers and students for assessment of JSA in assigned taluka, which is aimed at strengthening the institutional capabilities for enhanced and more comprehensive approach towards the existing as well as upcoming JSA schemes. The training would focus on the following components:

A] Extension: Development of UMA institutes as public knowledge infrastructure accessible to public e. g Ability to work as Third-Party Audit agency.

B] Teaching: Enabling effective guidance to student in development sectoral research – Training the trainer.

C] Research: Exposure and simulation towards emerging issue in development sector specially watershed activities, planning and management.

3. Expected Outcomes:

- Professors and students from 17 colleges across Maharashtra will be trained to use advanced concepts and practices to carry out assessment of JSA, using the contents of the modules developed by CTARA.

- Facilitate the trainees to apply learning from the training for assessment of existing JSA in assigned taluka and identify concrete interventions for improvement.

- Key Performance Indicators:
    1) Comprehensive understanding of the procured data and assessment methodology by participants.
    2) Preparation of a quality report after the field visits regarding suggestions and observations about the visited JSA villages.

4. Workshop Details

Day1:

The program was inaugurated by Shri Eknath Dawale (IAS), Secretary of Water and Soil Conservation Department in presence of Shri Abhijeet Bangar IAS, DM Amravati, President of PRMITR, Prof. Milind Sohoni and other dignitaries where Prof Sohoni spoke about the convergence of Government, Academic bodies and Research Curricula for concrete development outcomes.

Figure 1: Inaugural Session of workshop

The inauguration was followed by four technical sessions. The first technical session by Mr. Hemant Belsare briefed participants on Watershed Programs in State of Maharashtra, the purpose of Jalyukta Shivar Abhiyan and scope of third-party assessment.

The second session by Mr. Gopal Chavan where he encapsulated the demand side of water for agriculture where he explained crop sowing seasons, crop water requirement, growth stages, rainfall distribution in the Maharashtra and water use efficiency under various farming Systems where he also discussed about managing the water stress for Kharif as well as Rabi crops.

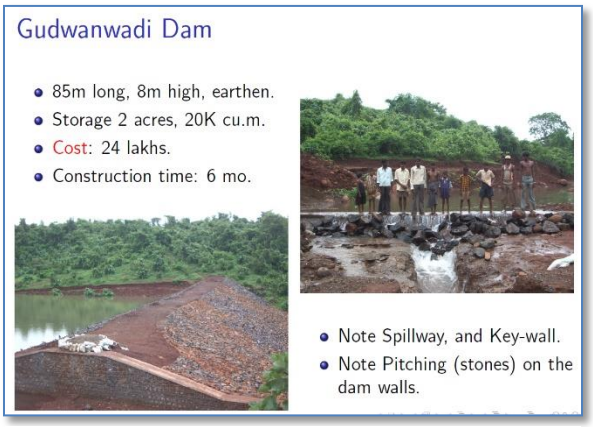

Figure 2: Details of Gudwandi Dam

The third session was taken by Prof. Milind Sohoni on watershed Interventions. He comprehensively explained each type of intervention included their purpose, where to do, other parameters. Also, he explained scenarios of Gundanwadi Dam, Manipada and treatment potential map of Daregaon village.

The fourth Session was by Mr. Hemanth Belsare where he explained extensively about Water budget as planning and engineering tool. He also explained the hydrological cycle and scientific components of water budget embedded with a sample village water budget from JSA 2017-2018.

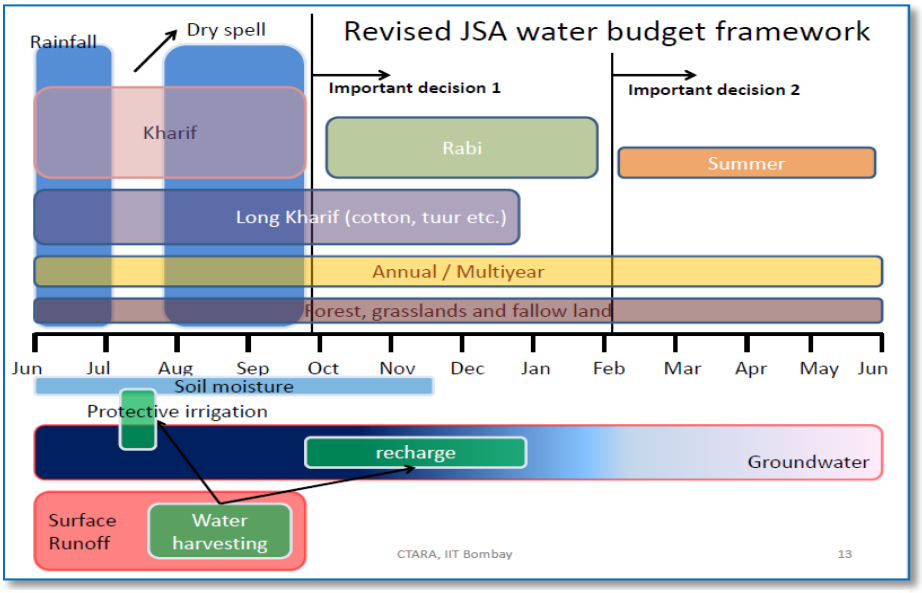

Figure 3: Revised Water budget framework

Day 2:

A total of five technical sessions were conducted on Day 2. First two sessions were taken by Mr. Vishal Kumar on a cycle of JSA which included processes of selection of village, planning, the convergence of funds, implementation and outcomes. In the second session, he discussed the assessment which included the need for desk assessment, how to study JSA village plan, secondary data and village maps.

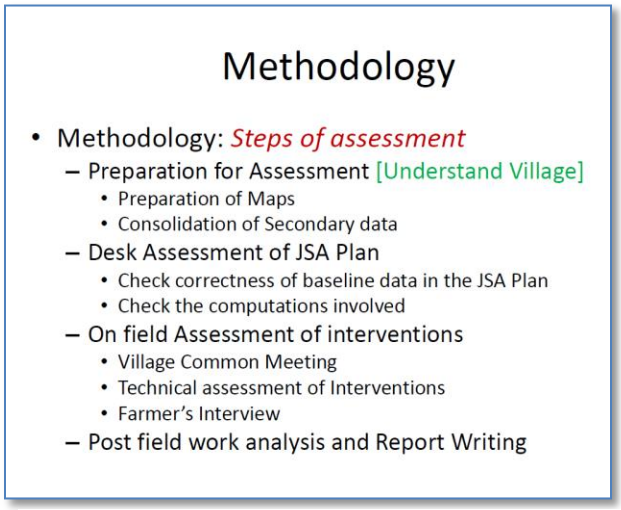

Figure 4: Steps of Assessment

Then he discussed on field assessment formats of the works done under JSA and it impacts

with more focus on beneficiaries. Next session was a Glimpse on Community Drinking Water Assessment which included the issues and the pattern of stress.

The third session was taken by Ms. Ankita where she explained the palghar case study on JSA. It was an interaction session where participants asked questions.

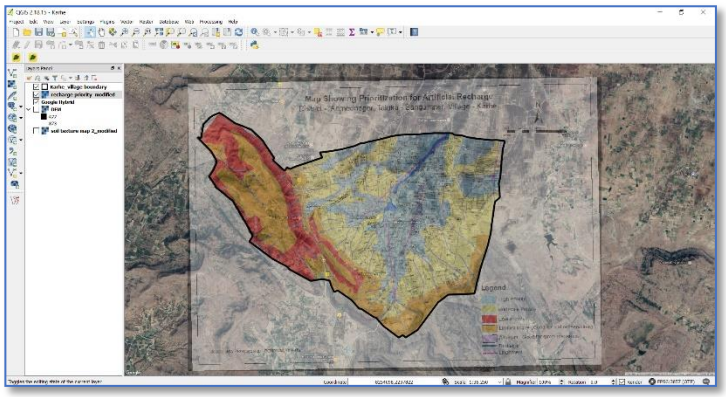

Figure 5: Overlaying of layers in QGIS

In the next session a tutorial on Q-GIS was taken up by Ms.Prajakta. Due to lack of time she explained very quickly what vector and raster data is, how to prepare shapefile, georeferencing maps in the Q-GIS. Also, some important sites were shown.

The day and program concluded by felicitation of the team of CTARA-IITB by PRMITR.

5. Way Forward:

The comprehensive training sessions which started with the enlightening note by Shri Eknarh Dawale (IAS) went with great enthusiasm and keen interest both among the participants and resource persons. The technical modules embedded with factual data and case studies gave a 360 degree look to the participants of JSA as a system to change the water consumption and conservation across the state of Maharashtra. The introduction module on software like Q-GIS also introduced participants a new technical tool which could change the way of problem solving in water sector. The keenness and zeal with which the participants approached each module and their question was really appreciated by the resource persons

In the next phase, the participants are expected to make field visits and undertake assessment of JSA schemes in allotted talukas. The groups are expected to collect data from the TAO or DSAO

by showing the letter written by WSCD. The data will be analyzed using the analytical framework provided by the project team. The outputs of the analysis would be produced subsequently and will be used to identify the quality and impact of JSA schemes.

6. Expectations by WCD

In the long run, the reward of Jalyukt Shivar Abhiyaan is much dependent upon successful implementation of Exit protocol. Execution of exit protocol demands a participatory management of common pool resources (such as ground water) at village level. According to the GR, the Village Water supply and Sanitation Committee of respective Gram panchayat have to play a crucial role in its execution.

Expectation of WCD from UMA Colleges:

1. Colleges should see that (on the occasion of 1st May, 15th August, 26th January, 2nd October or विशेष ग्रामसभा) the Gram Panchayat has approved the Water Neutrality report (जलपरिपूर्णता अहवाल). If it has not been approved, then understand the reason behind the delay from Krushi Sahayak and Sarpanch.
2. Review of Water Neutrality report (report format is attached with the GR issued on 10th Oct. 2017 by department of Soil and Water Conservation) and check its consistency with respect to the approved JSA Villages plan. Students should assess the changes in crop area and agricultural productivity mentioned in exit protocol in comparison with the Crop Sowing report and field observations.
3. As per the GR (issued on 10th October 2017 by the Soil and Water Conservation department), it is the responsibility of Village Water Supply and Sanitation Committee to ensure proper handover of soil and water harvesting structures, implementation of Maharashtra Ground Water Act 2009, management of cropping pattern, construction of new structures as per the future demand and promotion of water literacy.
4. During field visit, the colleges should interact with the members of Village Water Supply and Sanitation Committee. While interaction, students should understand the measures taken by this committee to maintain the water neutral status of village (e.g. implementation of ground water act. Students should also assess their understanding about JSA in general.

5. As per the GR, it is the responsibility of Taluka level committee to prepare water Neutrality report. Students should meet TAO (member secretary of Taluka level committee) and discuss their observations regarding implementation of exit protocol.
6. Students can recommend suitable changes in current set of practises based on their observations and learnings.

Appendix

A. Allotted taluka to UMA Institutes

Sr. No.	Name of Institution	Taluka Allotted
1	Sardar Patel College of Engineering	Karjat, Raigad
2	Department of Technology, Shivaji University	Kolhapur taluka, Kolhapur
3	Padmabhooshan Vasantraodada Patil Institute of Technology	Kavathe Mahankal, Sangli
4	*SVERI's* College of Engineering	Pandharpur, Solapur
5	KIT's College of Engineering	Panhala, Kolhapur
6	Bharati Vidyapeeth University, College of Engineering	Bhor, Pune
7	Maharashtra Institute of Technology	Gangapur, Aurangabad
8	Bapusaheb Shivajirao Deore College of Engineering	Dhule taluka, Dhule
9	Tatyasaheb Kore Institute of Engineering & Technology	Shahuwadi, Kolhapur
10	Karmaveer Bhaurao Patil College of Engineering	Satara taluka, Satara
11	Amrutvahini College of Engineering	Sangamner, Ahmednagar
12	Prof. Ram Meghe Institute of Technology & Research	Nandgaon Khandeshwar, Amravati
13	DY Patil College of Engineering & Technology	Hatkanangale, Kolhapur
14	Gharda Institute of Technology	Chiplun, Ratnagiri
15	Government Polytechnic Amravati	Amravati taluka, Amravati
16	Government Polytechnic Yavatmal	Yavatmal taluka, Yavatmal
17	Government Polytechnic Khamgaon	Khamgaon, Buldhana

B. List of workshop participants

Sr. No	Name of the Participants	Faculty /student	Institute/ Organization details	Email-id	Phone number
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	Kambekar				
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34	Prof. P. L. Kashinde	Faculty	MIT, Aurangabad	kashindepriya@gmail.com	9175012310
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53	Mr. N. Kulkarni	Faculty	Govt. Polytechnic Amravati	ngkulkarni68@gmail.com	9422401728

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C. Workshop agenda

Day-1 **04th February, 2018**		
	• **Registration and Refreshments**	**9:30am-** **10:00am**
Session **I**	• **Introduction to the Workshop** • **Guest Talks :** (Chief Guest) **Shri. Eknath Dawale, IAS** Secretary, WCD Maharashtra. (Special Guest) **Shri. Abhijit Bangar IAS** District Collector, Amravati	**10:00 am-** **11:00 am**
Session **II**	**Watershed Management-Jalyukt Shivar Abhiyan** Watershed programs (history, impact, practices) • JSA Purpose, GR • Scope of TPA	**11:00 am-** **11:30 am**
	Tea Break	**11:30 am-** **11:45 am**
Session **III**	**Farming Systems in Maharashtra** • Agro climatic zones of Maharashtra. • Farming Systems – kharif/rabbi, annual crops, summer crop, and horticulture. • Farmer's Perspective and key concepts- Irrigated/Rain-fed, Crop water requirement, Dry-spell management, Soil moisture, farmer practices, etc. • Irrigation: sources and practices	**11:45 am-** **01:00 pm**

	Lunch Break	**01:00 pm-** **02:00 pm**
Session **IV**	**Water Budget** • Concept of water balance, • Demand-supply – inflows and outflows with interventions • A water budget exercise	**02:00 pm-** **04:00 pm**
Session **V**	**Brief overview of Interventions** • Farm level/Area treatment/Drainage Line treatment	**04:00 pm-** **05:00 pm**
	Open Session • General discussion and queries about UMA, JSA etc.	**05:00 pm** **05:30 pm**

Day-2 **05th February, 2018**		
Session I	**Ideal Village Plan** • Matching water demand – planning and design	**09:30 am-** **11:00 am**
	Tea Break	**11:00 am-** **11:15 am**
Session II	**Assessment** • The life-cycle of JSA village • Assessment methodology • Tools and templates of assessment • Drinking Water Assessment	**11:15 am-** **12:30 pm** **12:30pm-** **01.00pm**
	Lunch Break	**01:00 pm-** **02:00 pm**
Session III	**Practice Session on Assessment** • Instructions for data collection • Practice on analyzing the data • Do's/Don'ts in the field work	**02:00 pm-** **04:00 pm**
Session IV	**Case Studies of Assessment** • CTARA and other institutions	**04:00 pm-** **05:00 pm**
Session V	**Some Research problems in the sector**	**05:00 pm-** **05:30 pm**
	Vote of Thanks	**05:30 pm-** **05:35 pm**

D. Important links

Sr. No	Details	URL
1	JSA Mapping activities	http://117.240.213.118:6080/jalyukt/index.jsp
2	NRDWP reports	http://indiawater.gov.in/IMISReports/
3	Recharge priority map	https://gsda.maharashtra.gov.in/index.php/GWRechargePriorityMap
4	Taluka map	http://www.mrsac.gov.in/en/taluka-maps
5	Land use land cover	http://bhuvan.nrsc.gov.in/bhuvan_links.php
6	Rainfall data	http://maharain.gov.in/
7	Census data & shapefiles of villages	http://www.gise.cse.iitb.ac.in/ms/MaharashtraCensus.html http://www.gise.cse.iitb.ac.in/ms/Attribute.html
8	Digital Elevation Model	https://earthexplorer.usgs.gov/
9	Mahabhujalvedh – soil texture, soil depth	http://mrsac.maharashtra.gov.in/gsda/
10	Google drive folder	https://drive.google.com/drive/u/0/folders/1_a6Ob56G5GgL9eMVJUOt9XF_zg4LWva_

E. Exercise schedule

No.	ACTIVITY	Description	ACTIVITY START Day	ACTIVITY DURATION	ACTIVITY Start date	ACTIVITY End date
1	**Data collection**	Contact TAO/DSAO collect required data	1	7	12-Feb-18	18-Feb-18
2	**Selection of villages**	Select 3-4 villages (medium expenditure, various types of structures, involvement of multiple depts.), Summary of structures in a village	4	4	15-Feb-18	18-Feb-18
3	**Field visit preparation**	Rapid assessment of JSA plan, location of structures, contact officers & schedule visit, rainfall data, geographical area, cropping pattern, survey formats, prepare LULC, soil maps, soil depth, contour map	8	4	19-Feb-18	22-Feb-18
4	**Field visit to 1st village + 2nd village**	Assessment of structures, farmer's interview and drinking water survey	12	10	23-Feb-18	04-Mar-18
5	**Field visit to 3rd village + 4th village**	Assessment of structures, farmer's interview and drinking water survey	22	10	05-Mar-18	14-Mar-18
6	**Draft Reports**	Outcome analysis and report writing, review of report by college faculty and sending to IITB	32	10	15-Mar-18	24-Mar-18
7	**Final Reports**	Finalizing the report by colleges and final report submission to IITB.	42	5	25-Mar-18	29-Mar-18

Report of Follow up Workshop under Unnat Maharashtra Abhiyan (UMA)

Prepared by

Technology and Development Solutions Cell

Centre for Technology Alternatives for Rural Areas

Indian Institute of Technology Bombay

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Table of Contents

1. Background of JSA training program

The government of Maharashtra had launched Jalyukt Shivar Abhiyan (JSA) on 5th December 2014, which is a watershed management program to mitigate drought like situation for 25000 villages of the state in five years. The prime objective of the scheme is to ensure year round availability of water for Irrigation and household requirement. The program has a mandatory requirement of assessment of all the JSA villages by Third-Party Agencies. In order to strengthen the existing capacities of assessment and evaluation in the state a training program was conceived by Unnat Maharashtra Abhiyan.

A 4-month long project of training engineering colleges in the state of Maharashtra on the assessment of Jalyukt Shivar Abhiyan (JSA) was organised by TDSC, CTARA (IIT Bombay). The project was carried out under aegis of Unnat Maharashtra Abhiyan (UMA) and was sponsored by Soil and Water Conservation Department, GoM. The objective of the project was to build the capacities of local engineering college faculty and students in watershed planning, including assessment and evaluation of Jalyukt Shivar Abhiyan

The programme had three phases:

- An initial training phase, participants sensitized by resource persons from CTARA on watershed practices and assessment of JSA, had successfully conducted on 4th – 5th February 2018 at PRMIT&R, Badnera, Amravati.
- A field component where participants were asked to carry out assessment of completed JSA works in Maharashtra with scientific and technical inputs from the project team consisting of researchers from CTARA.
- The follow up workshop, where participants presented outputs of the assessment and feedback will be provided to them on the areas of improvement.

More details about the training program and initial training phase can be found in an earlier document by TDSC titled “Report of JSA Assessment Induction Workshop under Unnat Maharashtra Abhiyan (UMA)”

This report documents the proceedings of the final follow-up workshop.

2. About the Workshop

After attending the first phase induction workshop in February, the assessment teams of all the colleges were involved in doing assessment of allotted JSA villages. The colleges were provided hand-holding whenever support was required by them. As per the training program, the colleges had to submit an assessment report after completion of the assessment task. However, due to many practical reasons many colleges could not complete the task in stipulated time and therefore the deadline was extended. Finally, most of the colleges submitted the assessment report to the CTARA project team. As per the plan, it was decided to hold a follow-up workshop for the participating colleges.

The follow up workshop was organized on 5th – 6th July, 2018 at MIT, Aurangabad. This was the final phase of the 4-month long training program.

2.1. Objectives of the Follow-up Workshop

The workshop was organized with the following objectives-

- To provide feedback to the assessment teams on their assessment exercise and to provide opportunity to the colleges to present their assessment work.
- To apprise the participants about new changes in JSA planning and PoCRA.
- To expose the faculties to different research areas in the sector and create a working group in areas of agriculture and water (JSA and Water Conservation activities).
- To provide extra training on GIS application. (this was repeatedly asked by the participants)

With these objectives in mind, a number of training modules were prepared. The modules also had some numerical exercises to be attempted by the participants during the workshop.

2.2.Expected Outcomes of the Follow-up Workshop

The following outcomes were expected to be achieved after completion of the workshop.

- Insights and learnings of college teams from assessment of allotted JSA villages.
- Suggestions to improve JSA/ (UMA) framework.
- Formation working group of college faculties in the sector of agriculture and water.
- Recommendation of best performing colleges for empanelment as Third-Party Agencies.

3. A brief description of different sessions of the Workshop

This section provides details of the different sessions of the workshop. The workshop ran for two days and the agenda for the same can be found at the end (Appendix I).

3.1.Training Sessions on the First Day

First day started with warm welcome by the MIT officials. The lamp lightning was done by honorable Chief Guests, Mr.Uday Chaudhari (IAS) Collector & District Magistrate Aurangabad, Mr. Deepak Singla (IAS) Commissioner Soil & Water Conservation at Government of Maharashtra (GoM) along with MIT and CTARA team members. Dr. S P. Bhosle, Principle, MIT, Auranagabad gave a brief introduction about the institute and the various courses being offered at the Institute. He expressed gratitude towards UMA for selection of MIT, Aurangabad for conducting the workshop.

On behalf of UMA, Prof. Milind Sohoni, CTARA, IITB, welcomed the guests and briefed about interlinking of academia and administration in the development sector. He explained the process of developing Maharashtra's knowledge network for regional development through UMA in detail and demand for the development professionals. In addition to that, he briefed about the organization, structure, working mechanism of UMA. He concluded the talk by conveying various thematic areas and opportunities in the development sector.

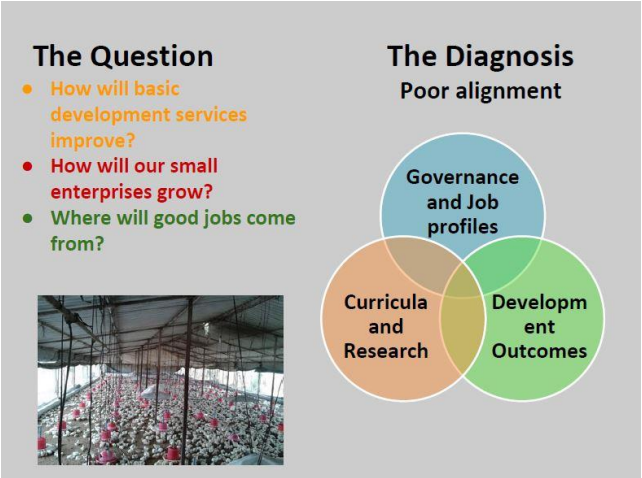

Figure 1: Quests for development sector

Mr. Uday Chaudhari urged to use the data sets available with government departments. He told that although the data may be available in crude format but inferences could still be derived from that. He asked that the concerned institutes to come forward to the administration for more fruitful engagement. He extended his support in these activities for effective implementation of "Unnat Maharashtra Abhiyan". He also threw light on various fellowship opportunities for

students who have strong desire to serve the society and how they can participate in the nation building activities.

Mr. Deepak Singla started his talk with mentioning the huge crisis of water that would be faced by India in coming years. He explained the importance of water management and need for developing new alternatives/technologies by research institutes. He also stressed on third party assessment/ evaluation of the schemes by the students. He also suggested that students can also conduct study tour and submit the report about the same. Dr. Y A Kawade, president G S Mandal, Aurangabad, expected that long term solutions should come from the academic institutes for water crisis through research as the resources were getting depleted. He highlighted that the role of plantation in the water cycle should be noted and afforestation should be promoted.

Following the inauguration session, five more sessions were planned on that day. The first session was conducted by Mr. Rajaram Desai, CTARA, IITB, who informed about engagement between Palghar district administration and CTARA for third party assessment work of Jalyukt Shivar Abhiyan. In addition to that, he explained the UMA mechanism and performance criteria for assessment of JSA reports in brief. He also stressed on the need of creating culture among the students for coming out with new solutions for sustainable development.

The next session was preserved for sharing insights and learnings from five top performing colleges. Among them the first one to speak was GIT, Ratnagiri. They explained background and topography of a village. Followed to that, they shared changes made in runoff calculation and field visit experience. Also, the drinking water scenario in the village was explained. They felt that more datasets related to aquifer details and guidance from department could have made assessment finer. Prof. Sohoni encouraged the team to develop a regional approach keeping in mind konkan specific conditions.

Second presentation was done by the host institution i.e. MIT, Auranagabad. They started with providing an overview of JSA in Gangapur Taluka and the status of the Ambegaon village before the interventions were carried out through JSA. They presented secondary data analysis, cropping pattern datasets, rainfall pattern, Digital elevation model of the village and corrections

required in the water budget calculations. Further, they explained the methodology and showed the map of visited interventions. Prof. Sohoni recommended to add the intervention assessment table in the report and made more analysis. They showed a map of interviewed households. They found nala widening and deepening has helped in increasing the groundwater level and wells are serving two more months than pre-JSA period.

Third presentation was done by PRMIT&R, Badnera, Amravati. The Team started with the introduction of villages and their status before and after the intervention. After that they shared insights of field visit and showed map of visited structures. They found failure of structures and bad drinking water situation in all the three villages. Following were the recommendations done by the team – (1) Strengthening of Drinking water sources needed to be done, (2) Repair of old structures and (3) requisite training to the agriculture assistant.

Fourth presentation was done by DoT, Kolhapur. They started with explaining location map of Kaneriwadi, Sangavade and Bhuyewadi villages. Then, explained the pre-intervention scenario and insights of pre visit desk assessment including water budget, intervention wise expenditure and Ok/Not Ok status. They also shared their field visit experience and recommended that strengthening of drinking water resources, water user association and efficient water use of available water must be done through JSA.

The last presentation of the session was done by Government Polytechnic, Amravati. They had chosen 2 villages for JSA Assessment namely Bhankheda and Yawali Shahid in Amravati district. The team started with the background of villages then focused on the insights gained by pre-visit desk assessment. They also shared the field experience with the map showing visited locations on it. Then, they explained drinking water scheme in detail and JSA interventions. They told that better cooperation by the Govt. departments to the team could speed up the work.

The Third session was presented by Ms. Ankita and Ms. Bhagyashri, from TDSC IIT Bombay. It was about key observations on field visit and reports of the participating colleges. The scoring, gap analysis and recommendations were presented to the participants.

Forth session was about Analysis of Farm-ponds by Mrs. Pooja Prasad, Research Scholar, CTARA, IIT Bombay. She spoke about the evolution and different types of farm-ponds, and presented a deep analysis of farm-ponds. She also explained how farm-ponds influence water

budget of a village. During the session she gave a short exercise of computing catchment area for two farm-ponds. Through that exercise, participants got insights about how allocation of farm-ponds should be done. On the same line, economics and net returns analysis was explained by her to the participants.

Fifth session was devoted to a practical training on QGIS software by Mr. Jitendra Shah, IIT Bombay. HE started with explaining the use of QGIS in context of JSA planning. In total he covered the following topics –

- Visualization of census data having 650 no of attributes.
- Choropleths using Expression builder, Symbols, Labels and Legends.
- To derive parameters from given data.
- To derive parameters using spatial queries.

The participants were made to do exercises during the training and he solved all the queries raised during the session.

3.2.Training Sessions on the Second Day

On second day total seven sessions were planned.

The first session was about orientation of "Working Group in Sector of Agriculture and Water under Unnat Maharashtra Abhiyan" by Prof. Milind Sohoni. He started with the current and upcoming challenges due to climate change and shift of farmers towards horticulture over grains. He also explained the effect of increased number of irrigation wells on drinking water wells. To overcome these issues he highlighted the central and state level key government programmes and enlisted the areas needed to explore. After that he explained the objectives and mechanism of the working group, prospective themes of UG and PG projects and introduced

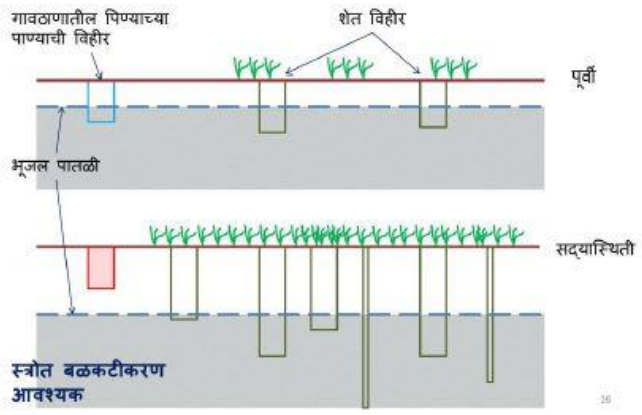

Figure 2: Effect of increase in density of irrigation wells on drinking water well

that day's remaining speakers with their research areas.

The next session was taken by Mr. Hemant Belsare, Research Scholar, CTARA, IIT Bombay. He explained that planning framework of Jalyukt Shivar Abhiyan has undergone significant changes in 2017-18 and minor changes in 2018-19, mainly regarding water budget. He then threw light on various issues from the state level to the village level in agriculture and water. Then he showed a simple hydrological cycle and talked about distribution of rainwater into its various components. After that he explained about seasonal availability of resources and demands in a pictorial form. In addition to that, he described the importance of protective irrigation required in dry spells with the help of study of soya bean crop in the Sinnar taluka. With this background, he thoroughly explained the concept, components of water budget of JYS and also various indices.

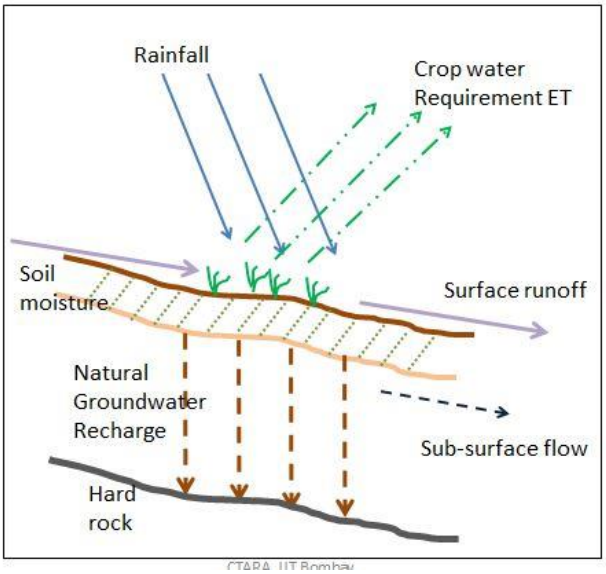

Figure 3: Water Budget model

The next session was conducted on Project on Climate Resilient Agriculture (PoCRA), by Ms. Shubhda Sali, Project Engineer, PoCRA. This program is specially designed for drought prone areas i.e. Vidharbha, Marathwada region and Jalgaon District of North Maharashtra region covering 5000 villages with financial support of the World Bank. This project has taken village level water budget to farm level on daily basis,

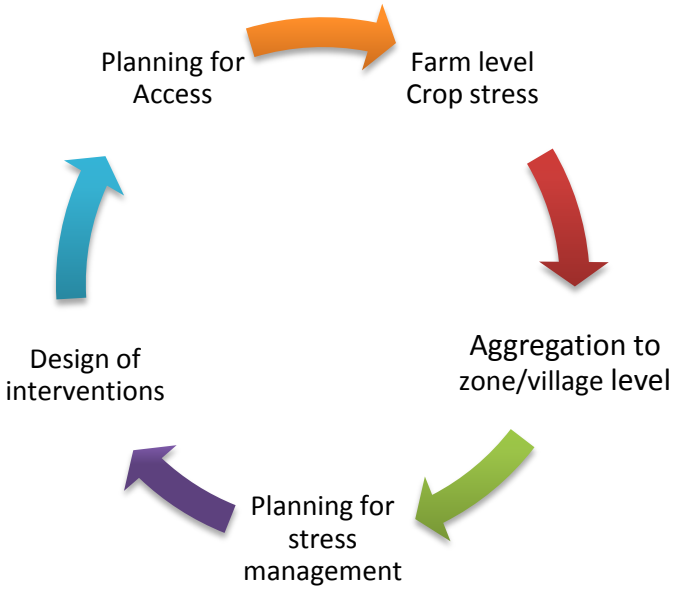

Figure 4: Planning cycle for village intervention plan

achieving more accuracy and close to reality. As a part of this project, the PoCRA team at IIT Bombay has designed an android based app by which it is now possible to measure farm level daily crop stress, runoff, groundwater and soil moisture. This helps in better planning of watershed interventions in the field. She then explained about the source and type of information required to run the model and showed outputs (Vulnerability Maps) generated for various scenarios. She showed difference between daily vs aggregate water balance model taking example of Wadhvi village.

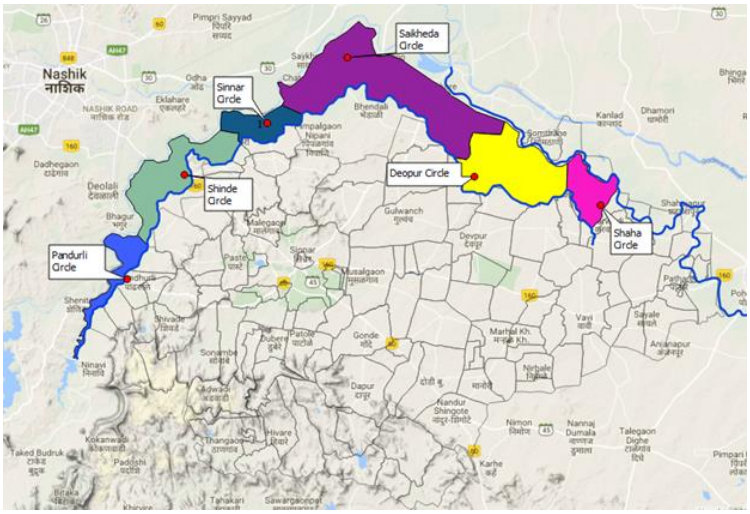

Figure 5: Zoning of Canal network

The fourth session was conducted by Mr Gopal Chavan, Research Scholar, CTARA, IIT Bombay on irrigation and water budget of a canal command area. He mentioned that canals have played a vital role in irrigation system of Maharashtra. He also explained the irrigation systems and its components with an example of Kadwa Project in Nashik and general issues related to public irrigation systems. Then he explained the role of community (Water User Association), policy problems and different concerns related to irrigation system. After that he shared his field experience of water budgeting of Kadwa canal in detail. He showed the actual flow measurements, ET loads and its analysis. Lastly, he enlisted the possible areas where student can contribute through projects.

In the next session, Mr. Venkatesh Panchariya, CM Fellow, explained the possible domains where colleges should work in collaboration with the Soil and Water Conservation Department, Maharashtra under UMA. He explained the problems involved in Galmukt Dharan Galyukt Shivar Abhiyan and requested to find out solutions for the same through BTP & MTP.

The next session was planned to be an interactive session to share experience of JSA work, difficulties faced, lessons learned and suggestions. Also, the faculty participants expressed their interest in working in different project areas in the next academic semester.

A tentative list is shown in the table below-

College	Tentative Project Area
GIT, Ratnagiri	Assessment of Jalykt Shivar Abhiyan (JSA) and Rural Water Supply
GP Amravati	Assessment of JSA
PRMITR, Amravati	Assessment of JSA and Demand based crop water requirement and management.
MIT, Amravati	Assessment of RWS
DoT, Kolhapur	Assessment of JYS and Galmukt Dharan, Galyukt Shivar
SVERI, Pandharpur	Reuse of WW for agriculture, Design of low cost testing kit for potable water, Assessment of JSA and RWS
AVCOE, Sangamner	Assessment of JYS and Jam watershed stress assessment
SSVPS BSD COE, Dhule	Assessment of Ashram School and Galmukt Dharan, Galyukt Shivar GP Auranagabad - Assessment of JSA
GP Auranagabad	Assessment of JSA

On the request of participants, an extra session was conducted of 2 hrs for QGIS training by Mr. Jitendra Shah, which covered the following topics-

- GPS Essentials (Mobile App) training to collect the waypoints, tracks and photos.
- Exporting and Processing of data collected through GPS Essentials
- Extraction of DEM and Contours.

4. Discussions and Suggestions

Among many other things, future scope assessment studies and possibility of research in agriculture and watershed management was also discussed. One more important thing which came up during the discussion was creating a working group of college faculties in these sectors and many of the colleges committed to it. The colleges were given some time to incorporate the inputs provided during the workshop and submit the final report.

Also, some of the broader suggestions received by the colleges are enlisted below-

1. An Audit Course is needed to be introduced in the regular curriculum by the university so that students can get more time for such activities.
2. Webinar should be conducted by the IITB on regular intervals on related topics.
3. Special request from polytechnic colleges - Provision of separate head for TA/DA for field visits by the colleges.
4. A 2-3 days detailed training on QGIS is required.

Appendix – (I) Workshop Schedule

Day 1

Day/time	***Session***	***Facilitators***
Day 1	***5th July 2018***	
08:45-09:30	Registration	MIT
09.30-09.40	Welcome address	MIT Principal
09:40-11:20	Welcome, context setting and expectations	Mr. Uday Chaudhari, (IAS), Collector, Aurangabad Ms. Pavneet Kaur, (IAS), ZP CEO, Aurangabad Shri. Deepak Singla (IAS),Director General, WALMI, Aurangabad Prof. Milind Sohoni, CTARA
11:20-11:35	Overview of the UMA and JYS Performance Analysis of Colleges • Pre- desk Assessment • Intervention and expenditure report • Field Work	Speaker - Mr. Raj Desai, CTARA Chairperson – Prof. Milind Sohoni, CTARA
11.35-12.00	Tea Break	
12:00-12:20	Evaluation of the Jalyukt Shivar Abhiyan : Insights, learnings and Experience Sharing	Speaker – GIT, Ratnagiri
12:20-12.40	Evaluation of the Jalyukt Shivar Abhiyan : Insights, learnings and Experience Sharing	Speaker – MIT, Aurangabad
12:40-13:00	Evaluation of the Jalyukt Shivar Abhiyan : Insights, learnings and Experience Sharing	Speaker – PRMITR, Amravati
13:00-13:20	Evaluation of the Jalyukt Shivar Abhiyan : Insights, learnings and Experience Sharing	Speaker – DoT, Kolhapur
	Common Chairperson – Mr. Hemant Belsare	
13:20-14:20	Lunch break	
14:20-14:40	Evaluation of the Jalyukt Shivar Abhiyan : Insights, learnings and Experience Sharing	Speaker – GP, Amravati
14:40-15:10	Open Discussion • Remaining colleges will share their experience and insights.	Chairperson – Ms. Oshin Dharap
15:10-15:30	Key observations by resource persons on the field assignments and reports	Speaker –Ms. Ankita Prayag, CTARA Ms. Bhagyashri Patil, CTARA Chairperson - Prof Milind Sohoni
15:30-15:45	Tea break	
15:45- 16:45	• Establishment of working group in Watershed and Agriculture. • Farm ponds and their analysis.	Speaker – Prof. Milind Sohoni, CTARA Ms. Pooja Prasad, CTARA Chairperson – Ms. Oshin Dharap
16:45-18:15	Hands- on Session on QGIS • Preparation of location map.	Speaker – Prof. Jitendra Shah, CTARA

	• Overlaying of village boundary and LULC/ Soil Texture. • Georeferencing of raster file. • Collection of locations and tracks from GPS device and its overlaying with Google earth/QGIS layers.	

Day 2

Day 2	***6h July 2018***	
09:00-9:30	Tea and Discussion	
09:40-10:00	Establishment of working group in Watershed and Agriculture.	Prof. Milind Sohoni, CTARA
10:00-10:45	Introduction and detailing of JYS water budget 2017-18	Mr. Hemant Belsare, CTARA
10:45 – 11.30	Introduction of PoCRA	Ms. Shubhda Sali, CTARA
11:30-11:45	Tea break	
11:45-12:15	Irrigation and WUA	Mr. Gopal Chavan, CTARA
12:15-12:30	New Areas to be explored by UMA institutions in Soil and Water Conservation sector	Mr. Venkatesh Panchariya, CM Fellow
12:30-13:00	Interactive session between CTARA and Participants • Discussion related to their Field visit experience and response from officials. • What needs to be done to improve JSA Framework? • What is student's future perspective towards JYS? • What is Faculty's agenda towards UMA? And Way Forward • Quick summary of interactive sessions. • Areas needed to explore under UMA. • Faculties (or students) responsibility to carry forward UMA.	Prof Milind Sohoni Chairperson – Ms. Oshin Dharap
13:00- 13:20	Distribution of Certificates & Vote of Thanks	MIT Principal
13:20-14:00	Lunch	
14:00-16:00	Session on QGIS and Discussion on Exercises	Prof. Jitendra Shah /CTARA

Appendix – (II) List of Participants

A. Faculty Members

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