

PoCRA Phase III Delivery

PoCRA Team
IIT Bombay
28th August 2019

Completed Deliveries

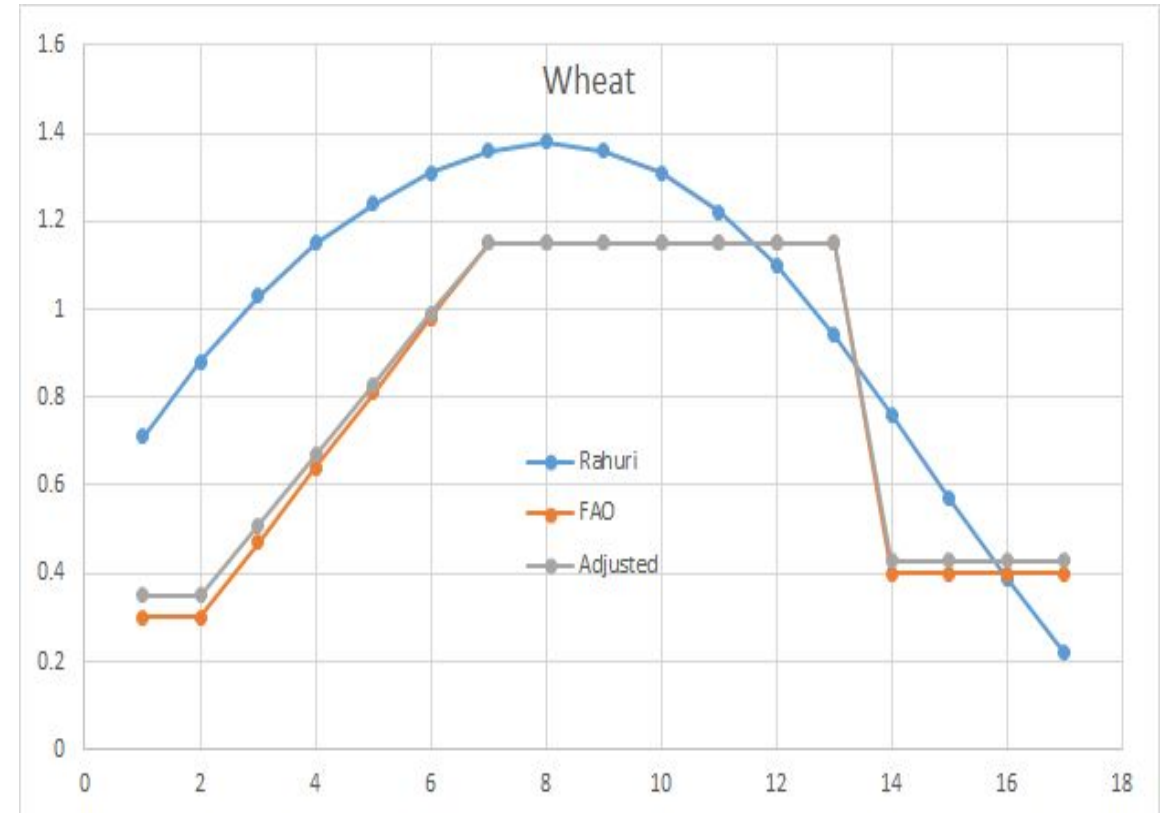
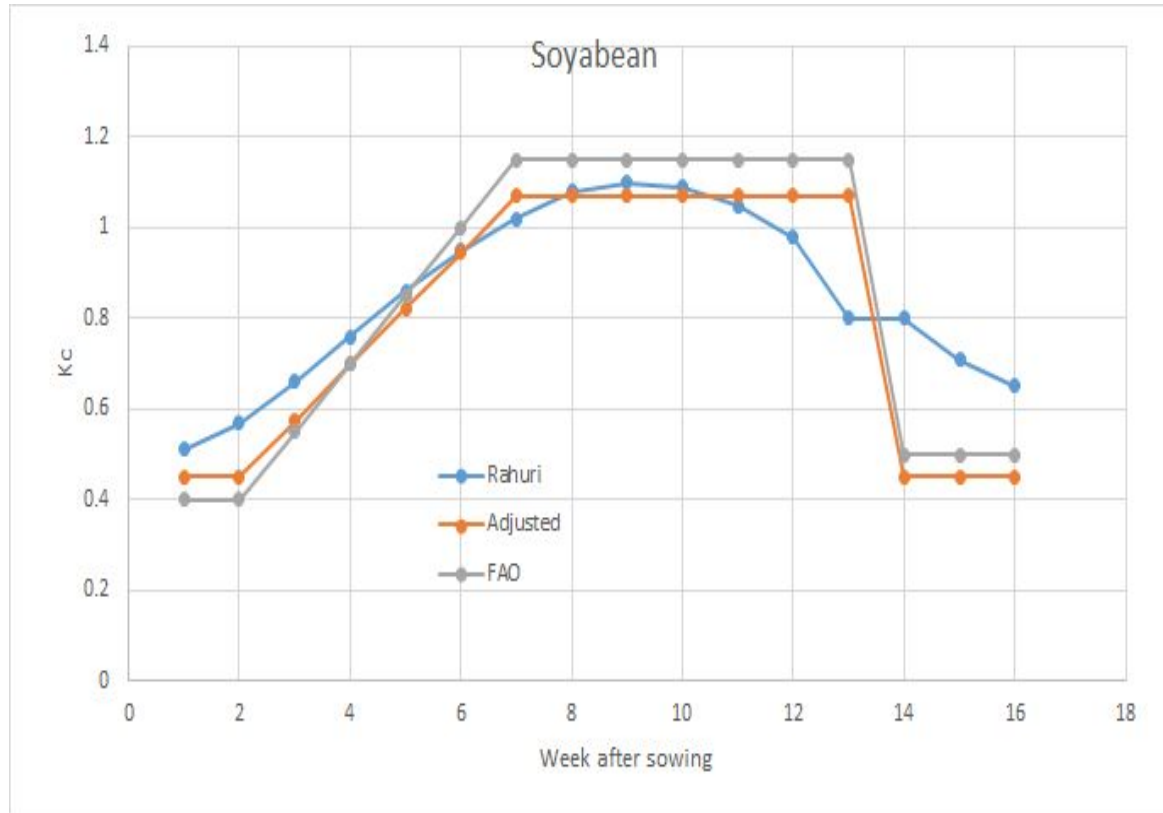
1. Ground Water Recharge Plan Document
2. Kc Modification
3. Stream Proximity Intermediate solution
4. Drip and Sprinkler Irrigation Modelling Framework - for M&E Agency
5. Observations from Field Visit for Planning processes - Updated planning guidelines
6. RAWE - Curriculum and Research Experiments Design
7. Video on water budget - Conceptual video. Video 2 will be made based on new MLP app
8. Dashboard
9. Support and services - phase 2 and updations as per skymet and ET0 model

GSDA Recharge Plan Document

Evaluation of Recharge plan on following

1. Well inventory data.
2. Surplus and deficit of groundwater in cluster.
3. Number of new wells to be given.
4. GSDA recharge, discharge & middle zones, new wells and access to water.
5. Water sharing mechanisms.

Kc Modification



Zoning API

In short..



Cluster + Stream Layer



Intersected Layer



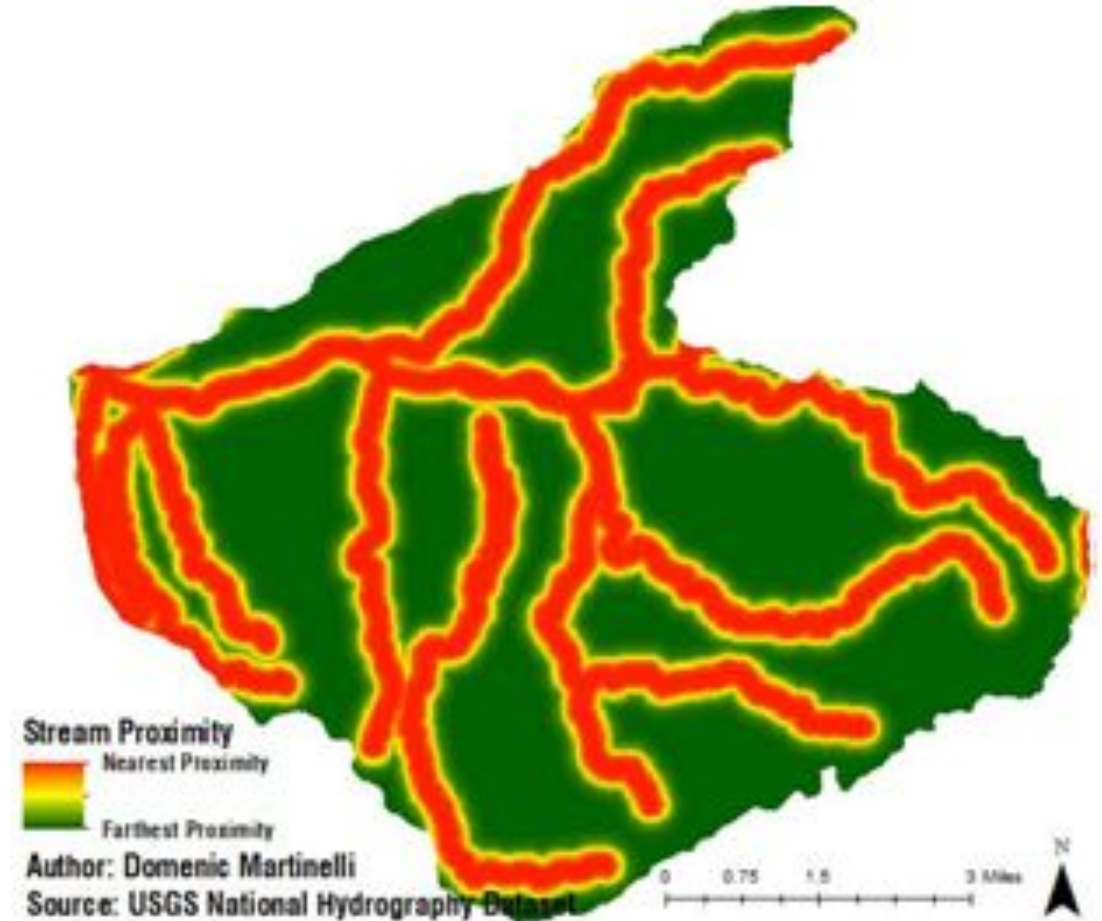
Merged Layer

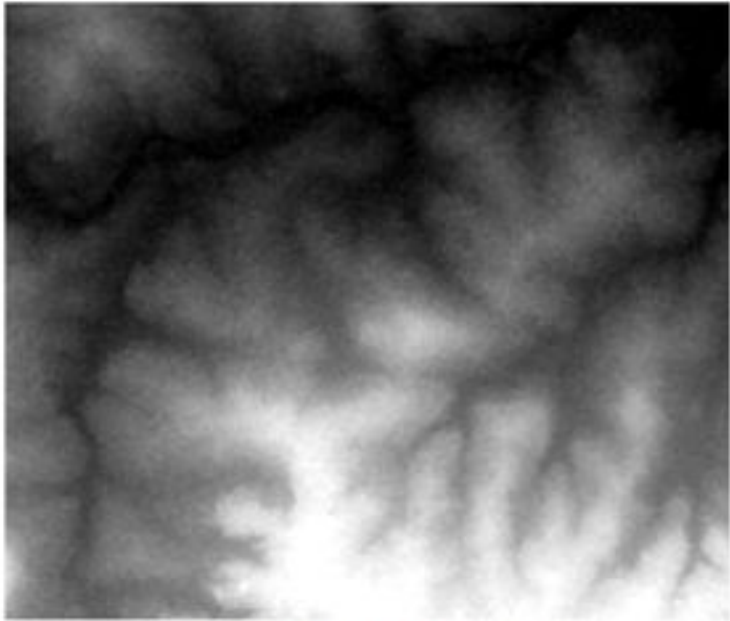
Stream proximity

the area surrounding the stream which is likely to be influenced with respect to water and soil conditions than that of the area far from the proximity of the stream.

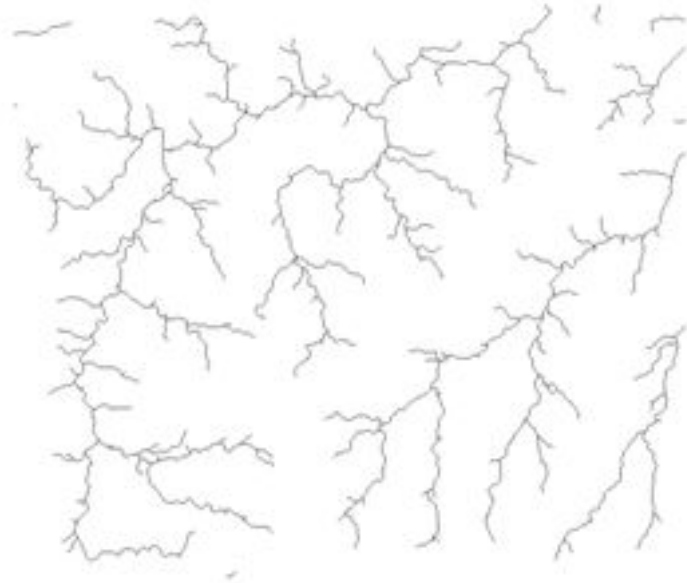
Generation of proximity-based maps is formulated as below:-

- Inputs:- DEM (Digital elevation model)
- Intermediate Outputs:-Raster of Accumulation, Drainage Direction, Stream Segment & Order
- Final Output:-Proximity Stream Map

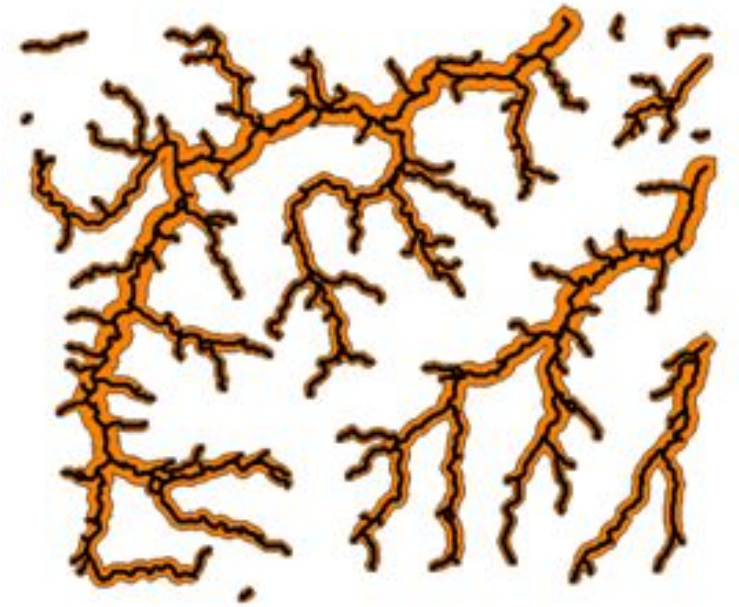




DEM

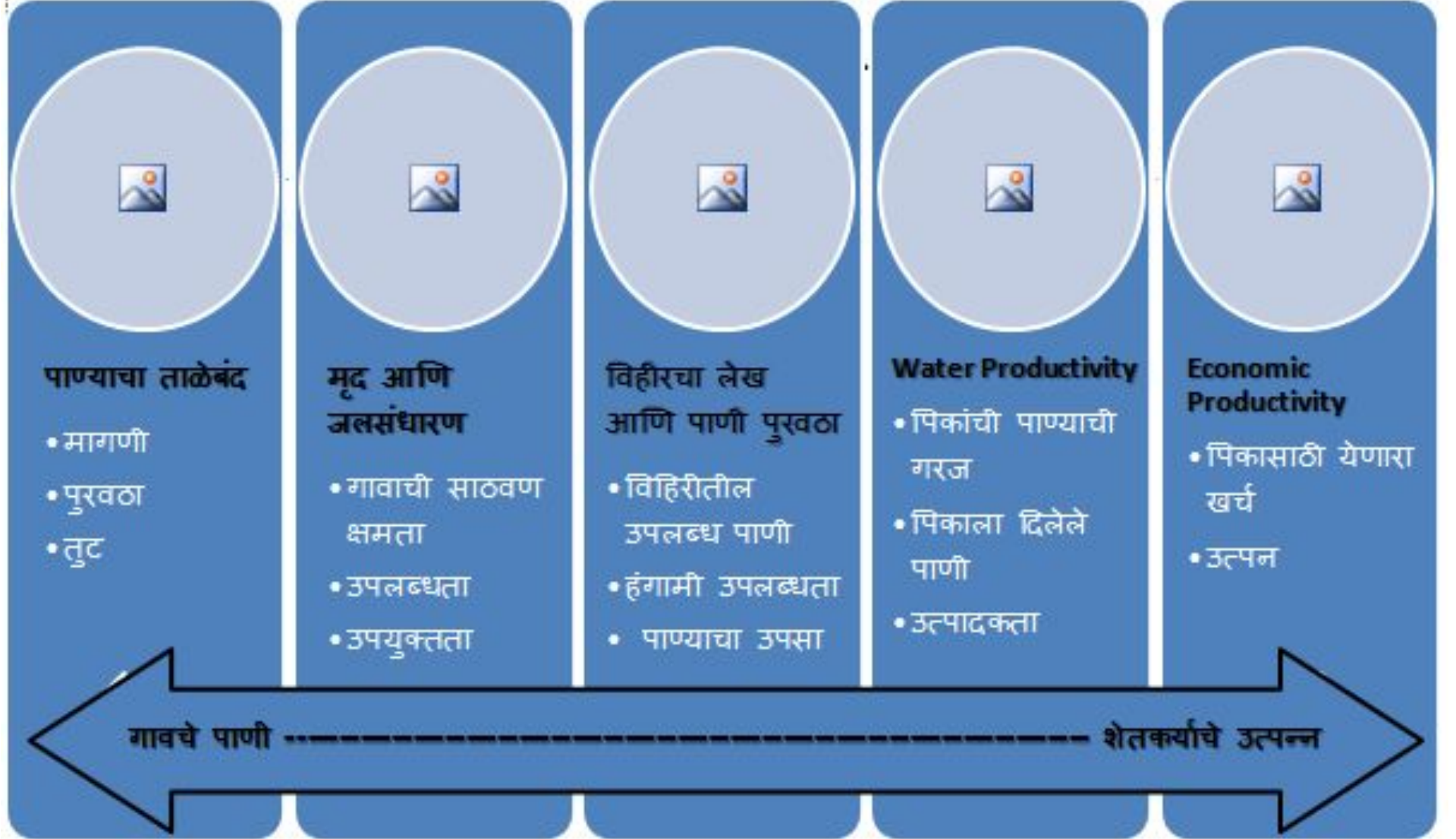


Stream Segment



Stream Proximity

RAWE



Sr. No.	College Name	Number of PoCRA Villages	Number of Students
1	College of Agriculture ,Badnapur Dist. Jalna	1	5
2	College of Agriculture ,Kharpudi Dist. Jalna	5	40
3	College of Agriculture ,Khandala Dist. Aurangabad	3	20
4	College of Agriculture ,Pathari Dist. Aurangabad	2	15
5	College of Agriculture, Kanchanwadi Dist. Aurangabad	2	20
		Total	105

Day I					
Session	Time	Activity	Topic	Speaker/Presenter	Details
I.	9.30-10.00	Inaugural ceremony		Chief Guest (PoCRA officials University officials ,others)	
	10.00-10.30		Introduction to PoCRA project	DSAO	PoCRA Officials will talk about projects
	10.30-11.00	Presentation	PoCRA and Water Budget		how PoCRA project uses water budget tool. Application oriented presentation
Tea Break(11.00-11.15)					
II.	11.15-12.00	Presentation	Water balance		What is point water balance and its components, Crop water requirement,
	12.00-1.00	Presentation	PoCRA water budget		What is water budgets, Volumetric Conversions, Demand, deficit, index calculations,
Lunch Break(1.00-2.00)					
III.	2.00-3.15	Practice exercise	PoCRA water budget		Required data for WB computation of single village with different cropping pattern will be given to students. Group of students will be asked to solve WB.
	3.15-3.30	Video	Soil and Water Conservation interventions		Video by PMU on soil water conservation will be shown to students.
Tea Break(3.30-3.45)					
IV.	3.45-4.30	Presentation	Soil and Water Conservation interventions		Students role in this rawe activity will be explained.

Day 2					
Session	Time	Activity	Topic	Speaker/Presenter	Details
I.	9.30-10.30	Presentation	Well Profile and Well Discharge		In this activity well profile questionnaire will be explained Well discharge computation will be explained
	10.30-11.00	Practice exercise	Practice exercise		Students will be asked to sketch well profile based on well profile questionnaire Also, to compute well discharge
Tea Break(11.00-11.15)					
II.	11.15-12.15	Presentation	Water Productivity		What is WP? What is its importance? How it is computed?
	12.15-1.00	Practice exercise	Water Productivity		Flood Irrigation/drip//sprinkler info into mm Water productivity questionnaire
Lunch Break(1.00-2.00)					
III.	2.00-3.00	Presentation	Economic Productivity		What is economic productivity? How it is computed?
	3.00-3.30	Practice exercise	Economic Productivity		Economic Productivity Computation
Tea Break(3.30-3.45)					
IV.	3.45-4.30	Question and Answer			Interaction with students and their queries will be answered

Drip and Sprinkler Irrigation Modelling

1. Manual for computation of Irrigated AET required to compute water productivity was delivered
2. The doubts were cleared in meetings
3. Questionnaire for water productivity part was explained for better interview on field

The Water productivity measurement framework was delivered to M&E Agency

Drip and Sprinkler Irrigation Modelling - Sample

Farmer: Baban Dane

Crop Area: 6 acre

sprinkler spacing: 20x40 foot

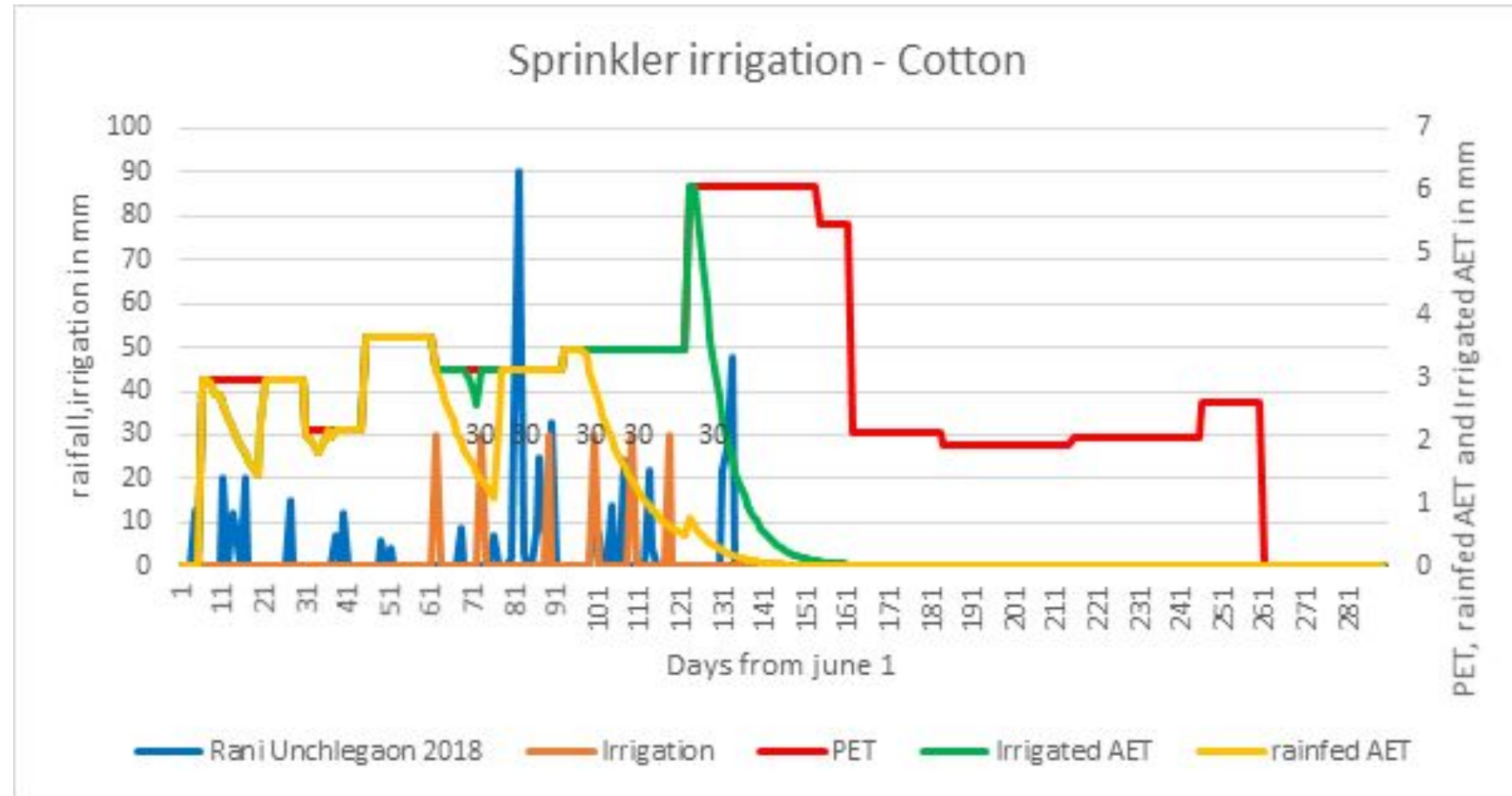
flow rate: 15 mm/hr

number of waterings: 6

irrigation time per patch: 2 hrs

water per irrigation: 30 mm

total irrigation: 180 mm



Baban Dane- Chapadgaon, Jalna

Drip Irrigation

Farmer: Kasubai Jadhav

crop area: 2 acre

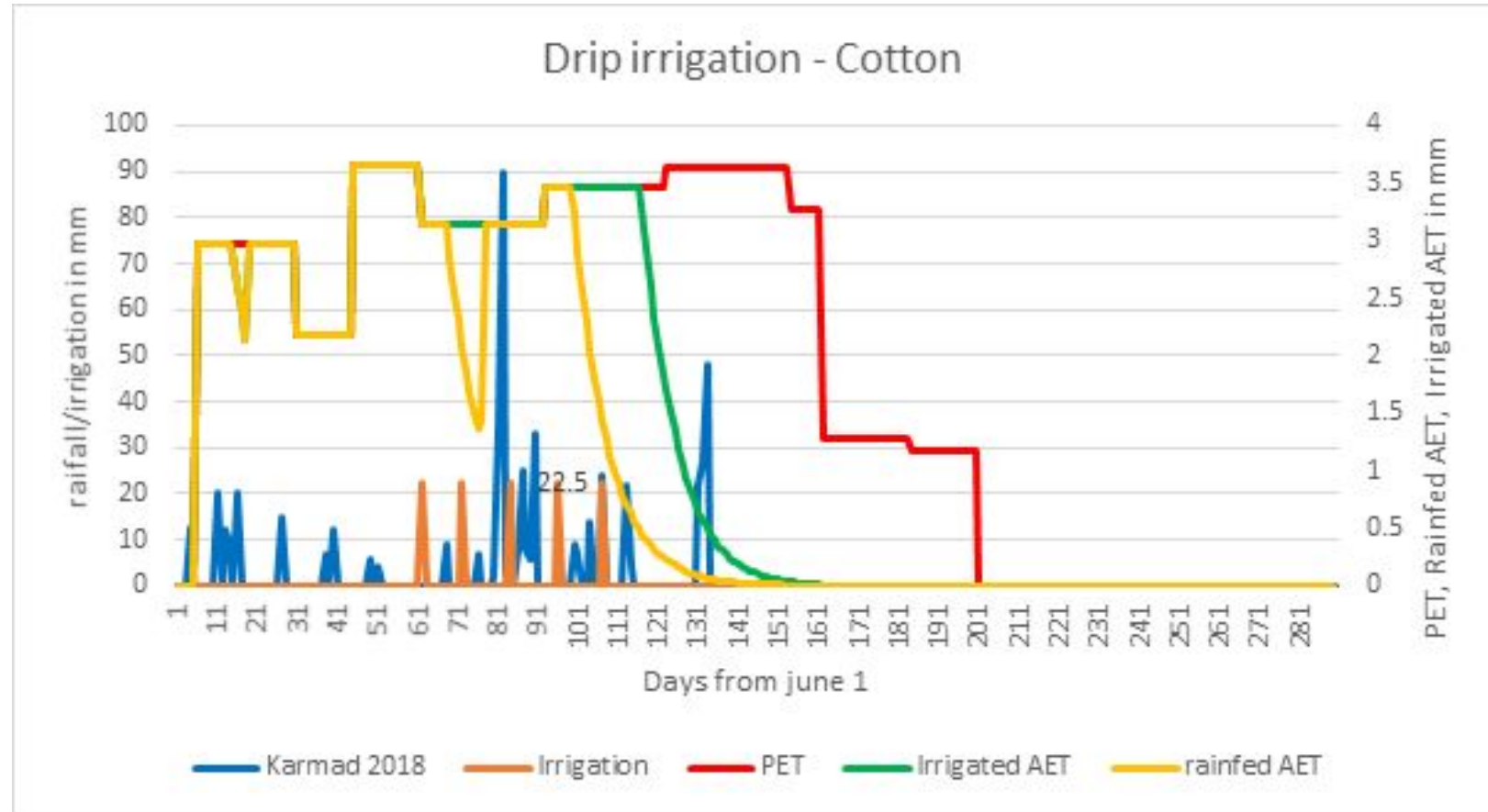
drip spacing: 0.5 x 1.6 m

drip flow rate: 6 LPH

number of waterings: 5

irrigation time: 3 hrs

irrigation water per day:
22.5 mm



Model results: irrigated AET example

Farmer name	<u>Baban Dane</u>	
Village	<u>Chapadgaon</u>	
Taluka	<u>Ghansawangi</u>	
District	<u>Jalna</u>	
Soil Type	clay loam	
	Irrigated	rainfed
Rainfall (input)	577.0	397.0
Runoff	167.4	102.2
Infiltration	409.6	294.8
SM	0.0	0.0
GW recharge	0.0	0.0
AET	409.6	294.8
PET (input)	811.0	811.0
Deficit	401.4	516.3
Irrigation	180	

* All values are in mm

yield: 4.5 q/acre

Farmer name	Kasubai Jadhav	
Village	Tongaon	
Taluka	Aurangabad	
District	Aurangabad	
	Irrigated	rainfed
Rainfall (input)	475	475
Runoff	152.2	132.6
Infiltration	322.8	342.4
SM	30.1	30
GW recharge	18.2	6.8
AET	375.8	305.6
PET (input)	555.8	555.8
Deficit	180	250.2
Total Irrigation	112.5	
Total Effective Irrigation (90% efficiency)	101	

yield: 4 q/acre

Irrigation water for drip is added to soil moisture with 90% efficiency.

Irrigation water for sprinkler is added to rainfall

Simulation is done in farm level app

Field visit observations/suggestions for better planning

1. Canal Details should be available with krushi sahayak in village/ currently no details are available with him or at GP office
2. Displaying Village maps in schools and engaging Krushi sahayak to explain it to school children
3. Setting up rain gauge in village and engaging school children in measurement with the help of krushi mitras
4. Formal provisions can be made for community wells
5. Documentation of community wells/other sharing arrangements in village
6. Improved formats need to be designed for community farm ponds, community wells highlighting proposed water management

Support and Other Services

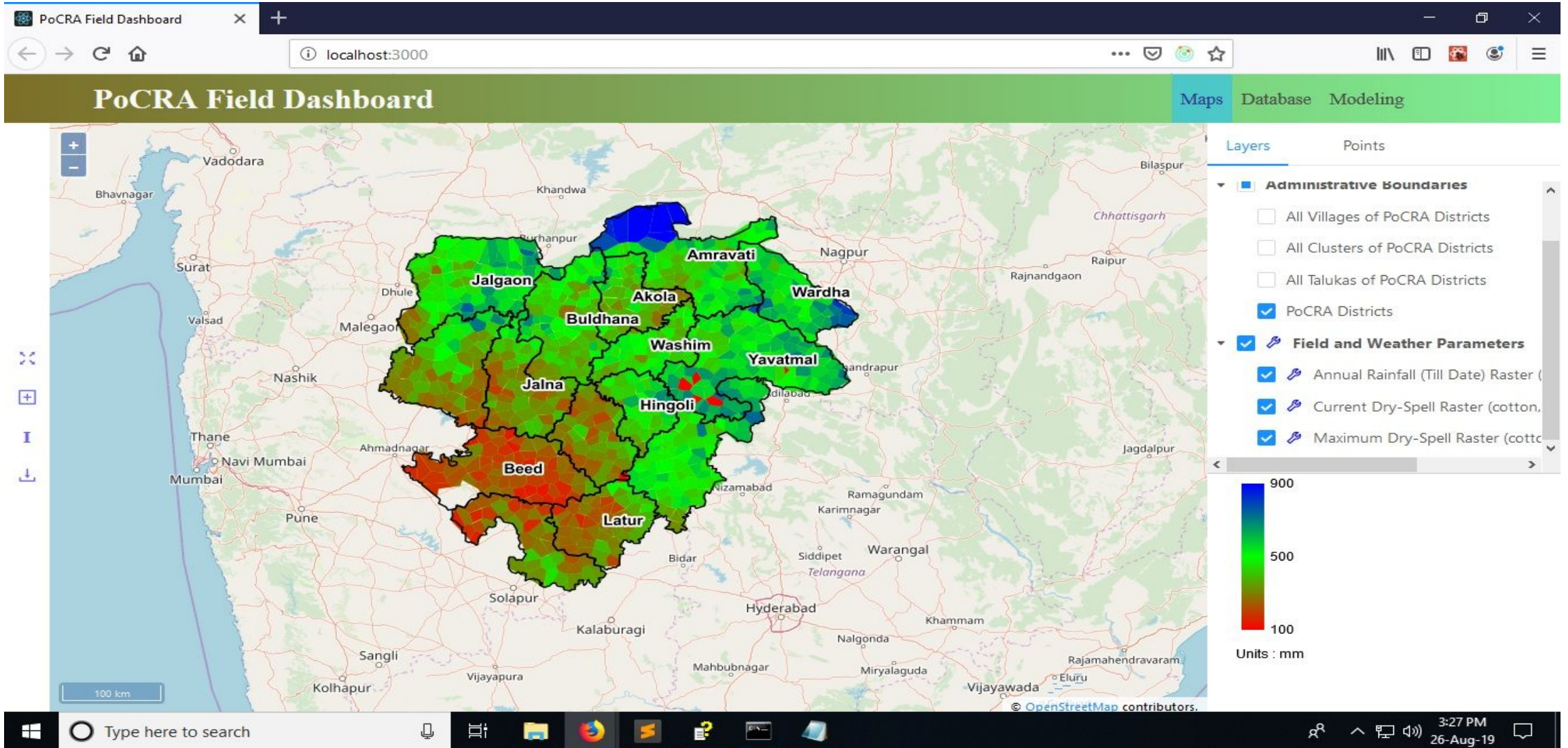
1. Formalization of plugin delivery - separation from QGIS - python code for running plugin
2. Daily Rainfall circles mapping for skymet: varying circles in 2018 and 2019.
3. Daily ET0 modelling updated in plugin code
4. Zone level aggregation coding
5. code for uploading to cloud Database
6. Running and setting up on PMU workstation for transfer to PMU

PoCRA Field Dashboard

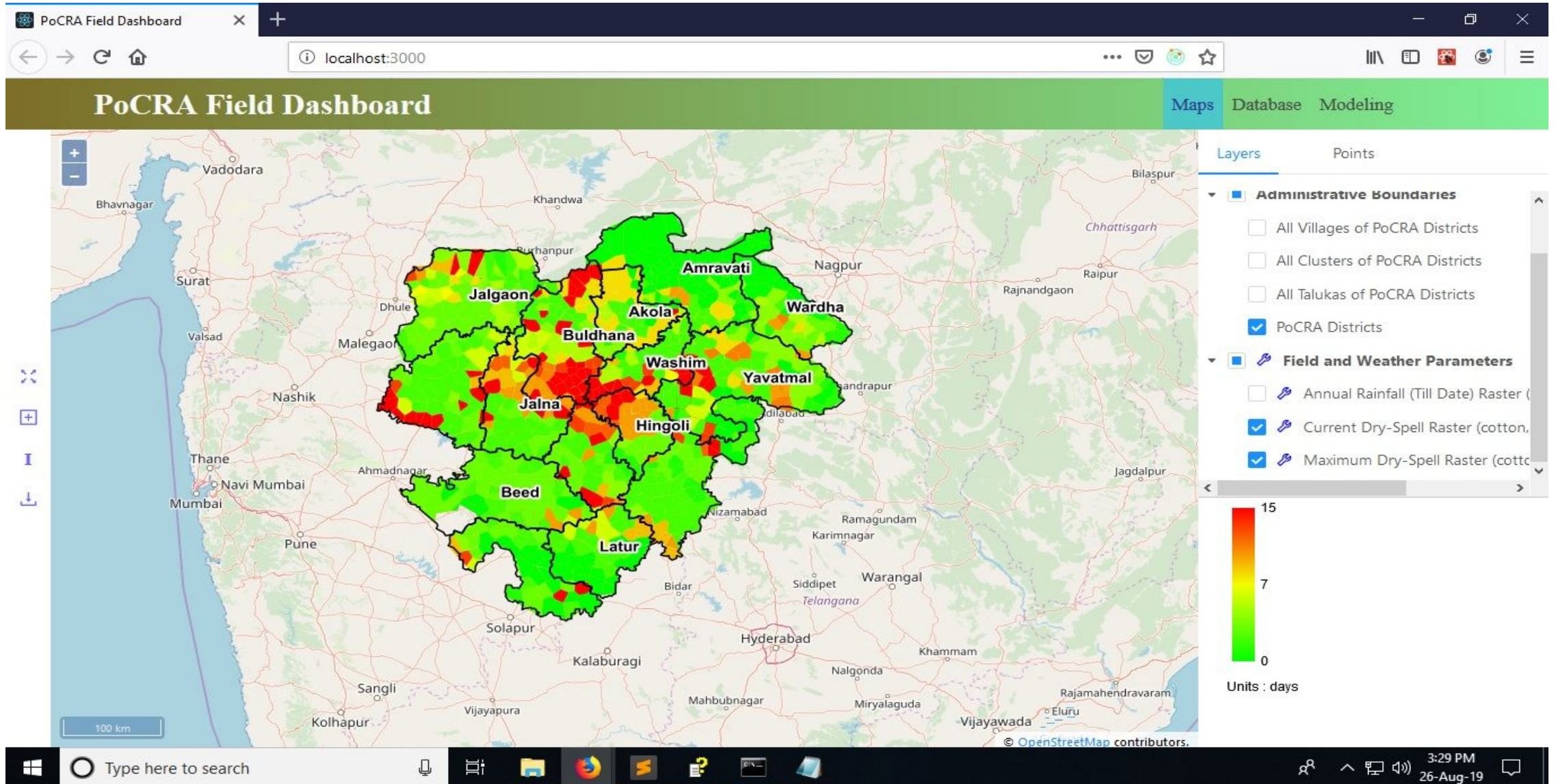
Previous (Phase II) delivery:

- **Form of delivery:** Demonstration on the Development VM
- **Deliverables:**
 - a web-mapping application
 - an estimation process running behind the web-mapping application
- **Features:**
 - Visualization of rainfall and crop-wise water component rasters
 - Spatially aggregated values of these parameters per administrative region
- **Major addition expected for Phase III:** Dynamic ET_0 computation

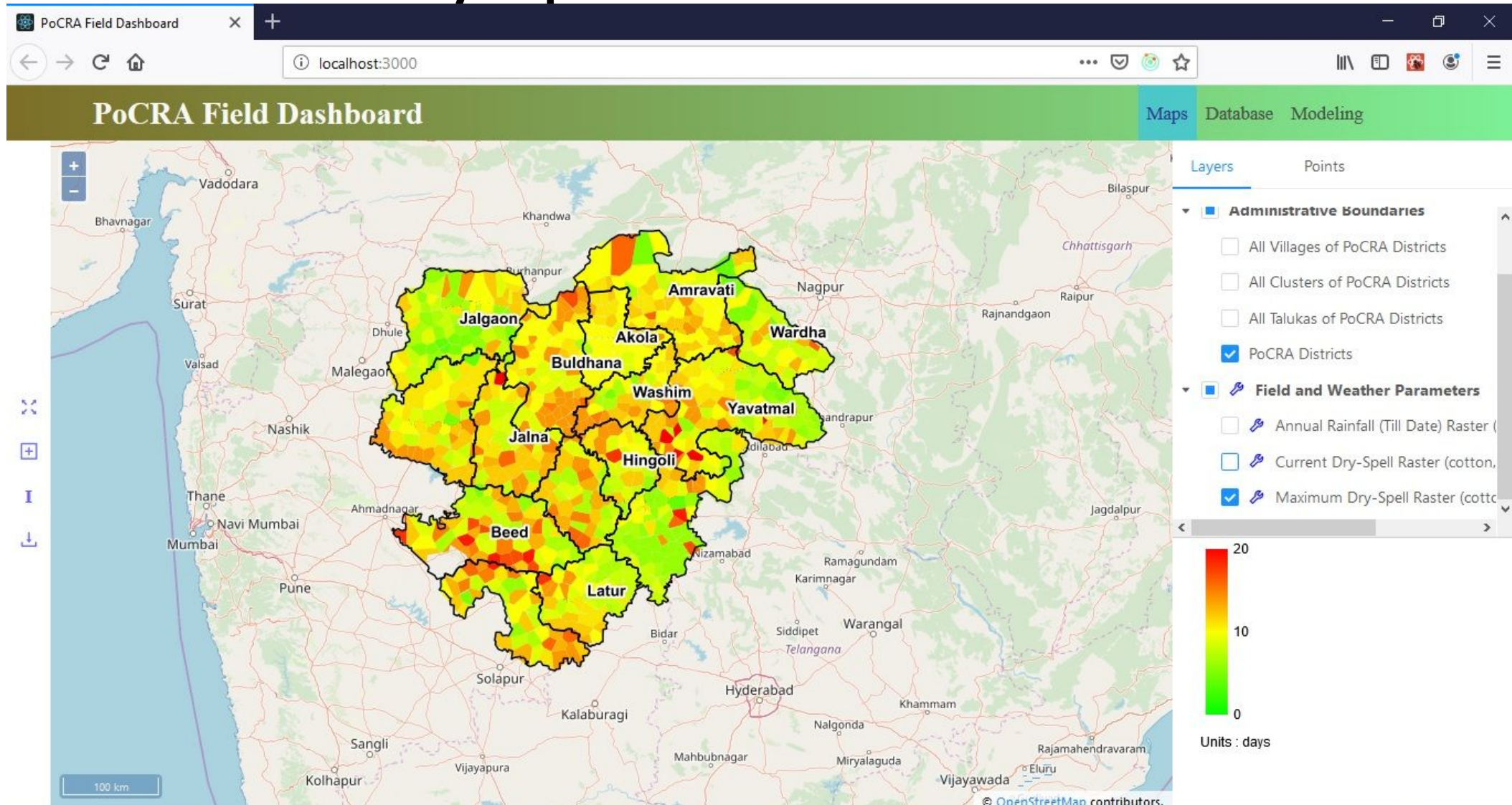
Total Rainfall Map



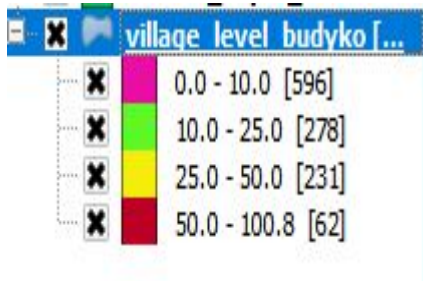
Current Dry Spell



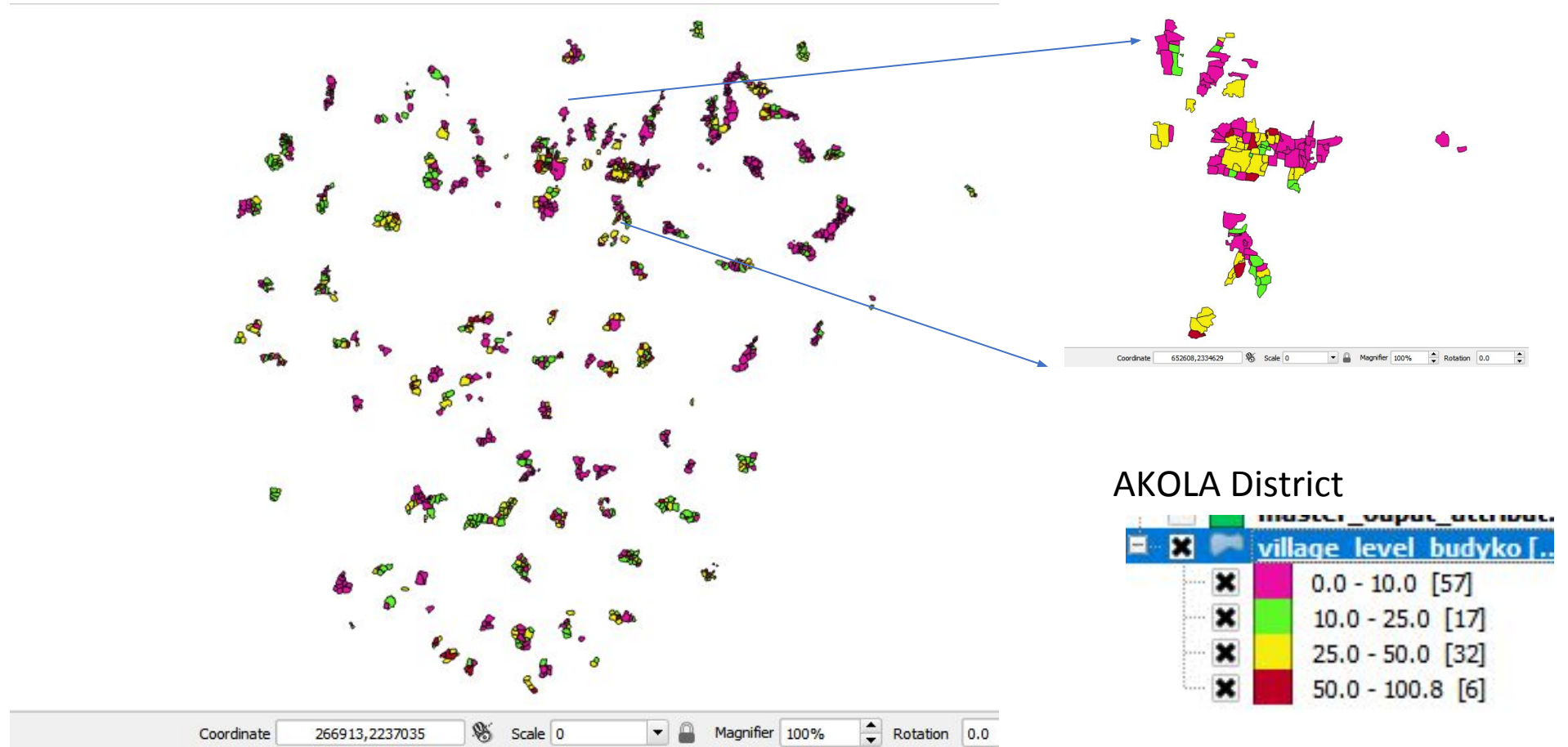
Maximum Dry Spell



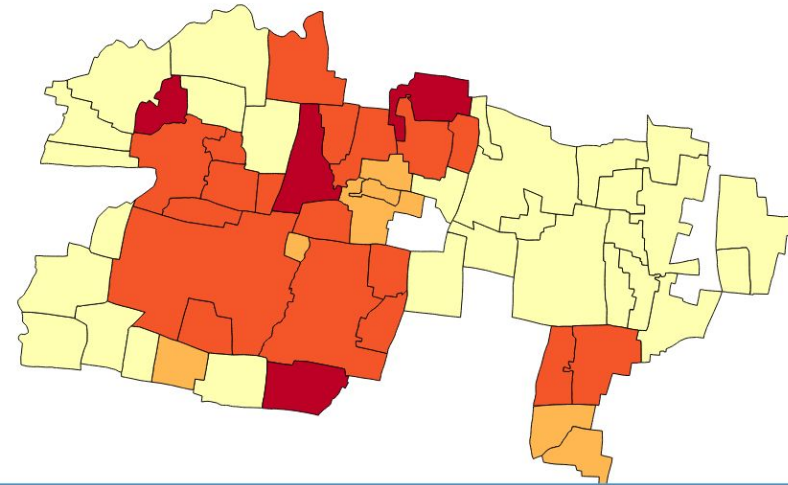
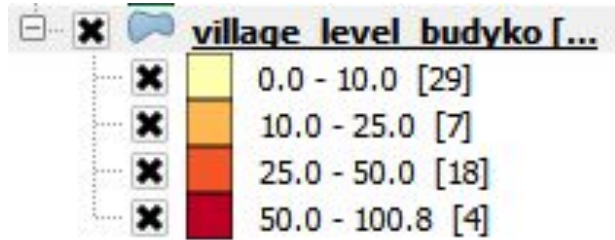
Storage Capacity Actual – Project Area



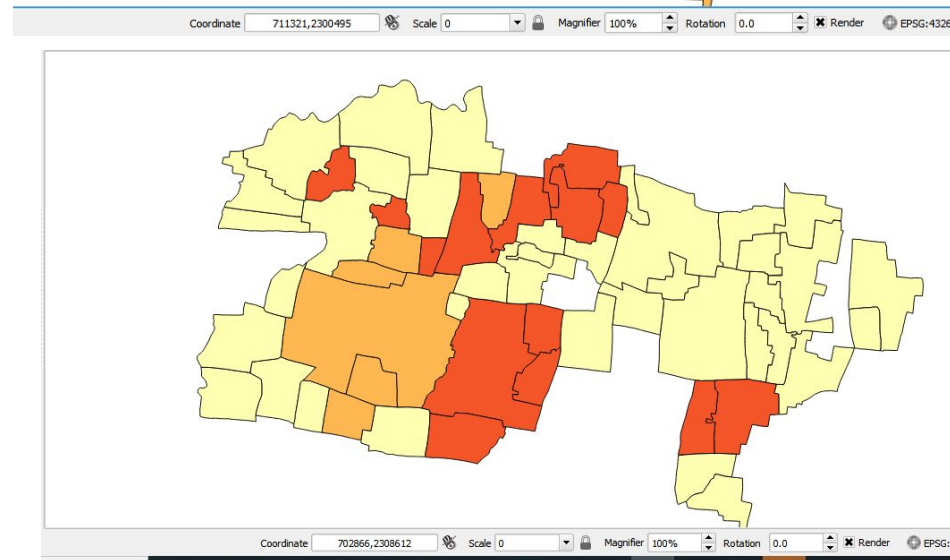
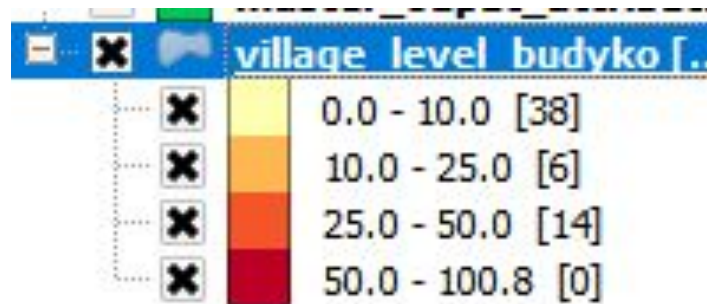
Feature count is there in square bracket – total 1167 villages



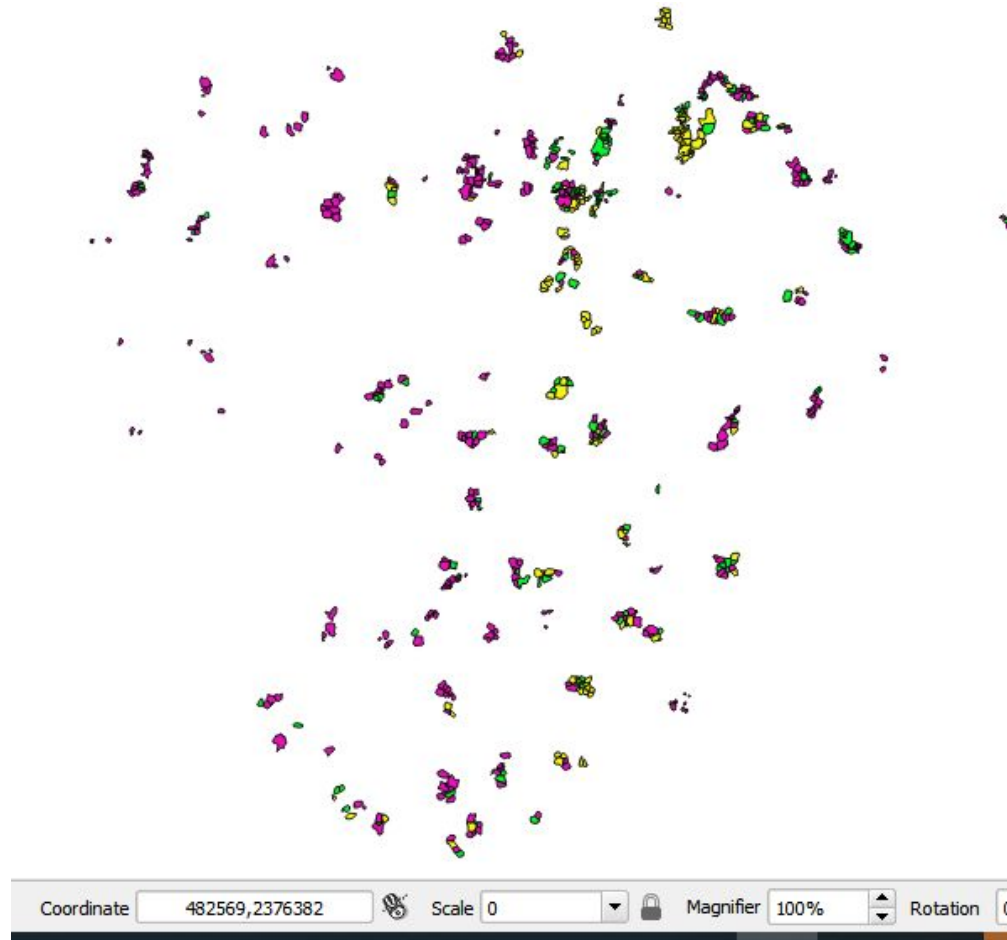
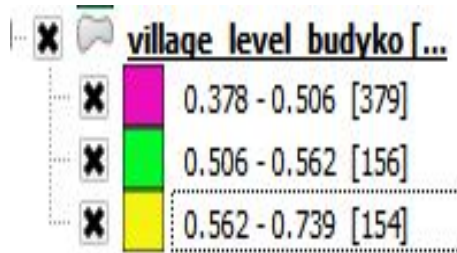
Storage Capacity Actual in mm– Aloka Taluka



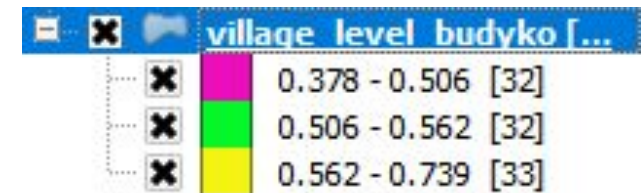
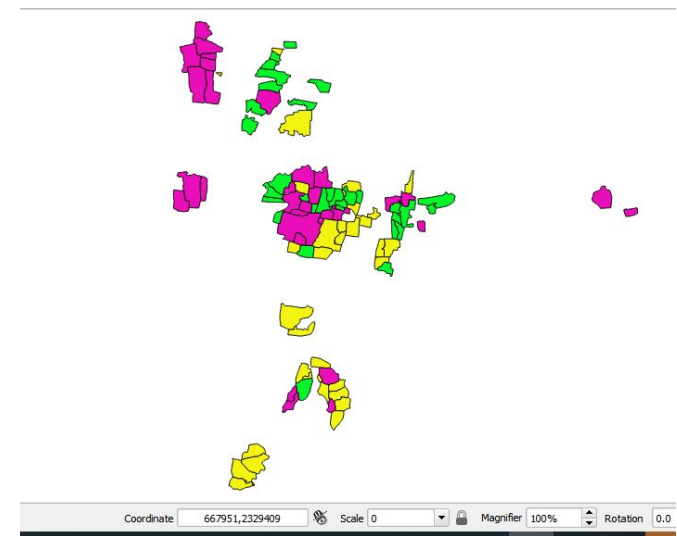
Area Treatment Actual in mm



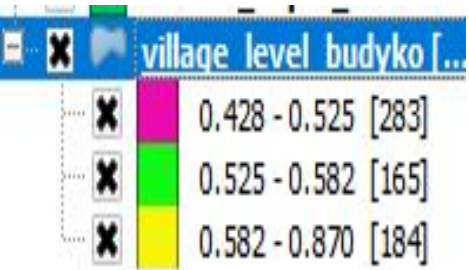
Rainfed AET/PET



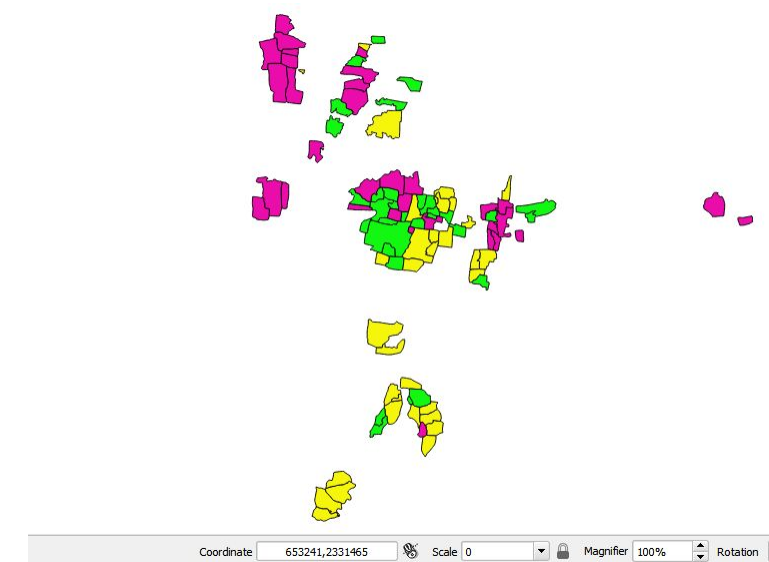
Akola District



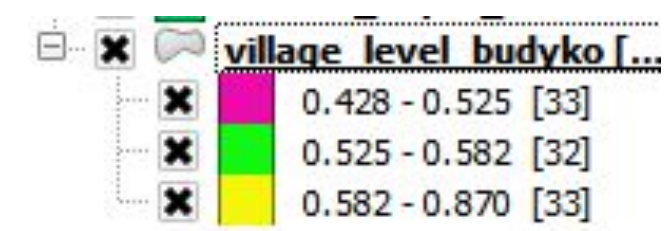
Irrigated AET/PET



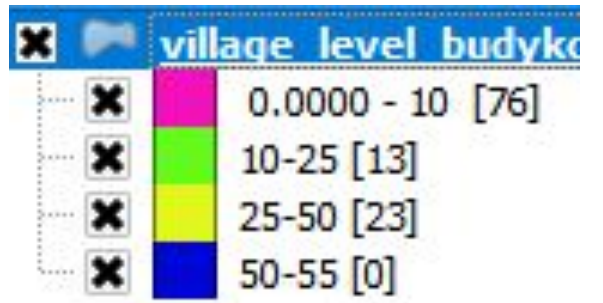
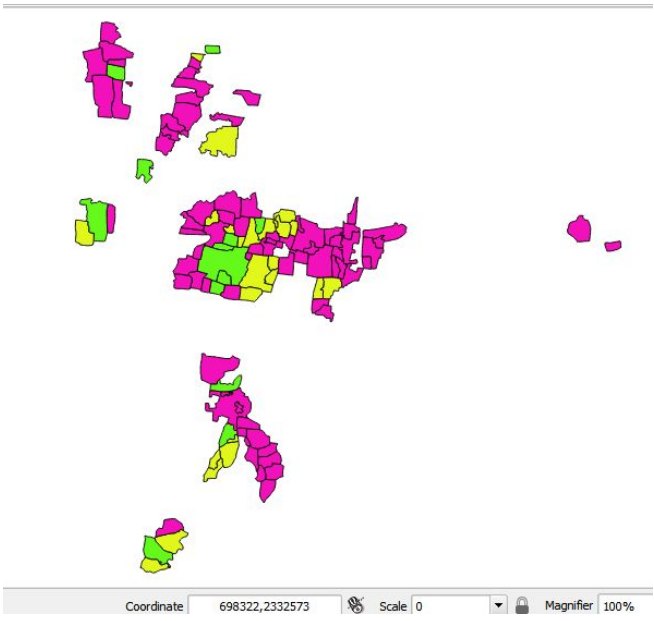
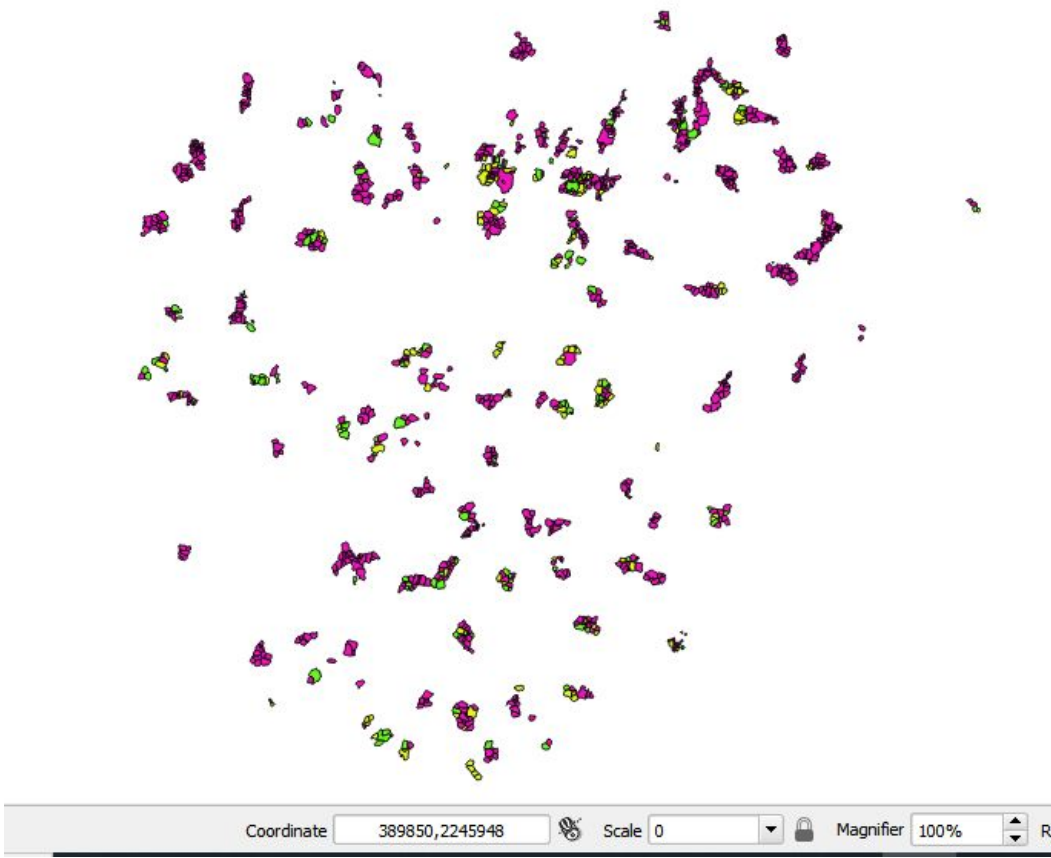
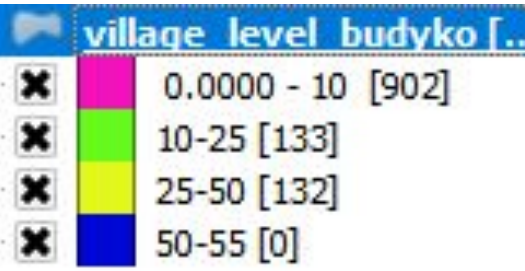
Coordinate 311704,2400436 Scale 0 Magnifier 100% Rotator



Coordinate 653241,2331465 Scale 0 Magnifier 100% Rotation



Area Treatment Actual mm



Backup: Deliverables (As per MoU)

Documents:

1. RAWE: Curriculum for Agri Universities, Research Experiments and Design Notes
2. Updated Village / Zone level planning guidelines

Software:

1. Dashboard
2. Updated MLP App
3. Water Budget videos

Services:

1. Reworking for formalization of plugin output and update into database - Plugin can now be taken over by PMU staff
2. Running plugin for phase II

MOU III

1. Integration of RAWE with PoCRA.
2. Follow-up and support for PoCRA planning processes.
3. Technical analysis and maps for stream proximity and its integration with PoCRA processes.
4. Evaluation and integration of modified soil data with plug-in and dashboard.
5. Evaluation and integration of GSDA recharge plans.
6. Support for M&E activities.
7. Case studies for stream simulations and validation. (along with SAUs)
8. Case studies from satellite-based area sown. (along with SAUs)
9. Support on ongoing software services

MOU III

10. Further evolvement of dashboard - Providing enabling environment to other agencies like crida, SAU's, Manage for generation of cluster based products.

MoU with IITB - PoCRA DoA

Objectives

1. To Develop Knowledge Products and Practices
2. Mainstreaming the Knowledge products and Practices with DoA
3. Working with SAU's for coordinating and supporting in various activities for capacity building

The research projects would cater to following areas - Cropping Systems, Agro-forestry, Horticulture, Livestock system, afforestation, sustainable value chain activities.

Fellowships

- Fellowships - 3 year duration for each batch
 - a. 2 PhD students - 3 years
 - b. 4 M.Tech students - 2 years
 - c. 4 Research staff
 - d. Faculty time, IITB research facilities
 - e. Overall Project coordinator