

नानाजी देशमुख कृषी संजीवनी प्रकल्प - पाण्याचा ताळेबंद

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30 November'17, POCRA, Mumbai

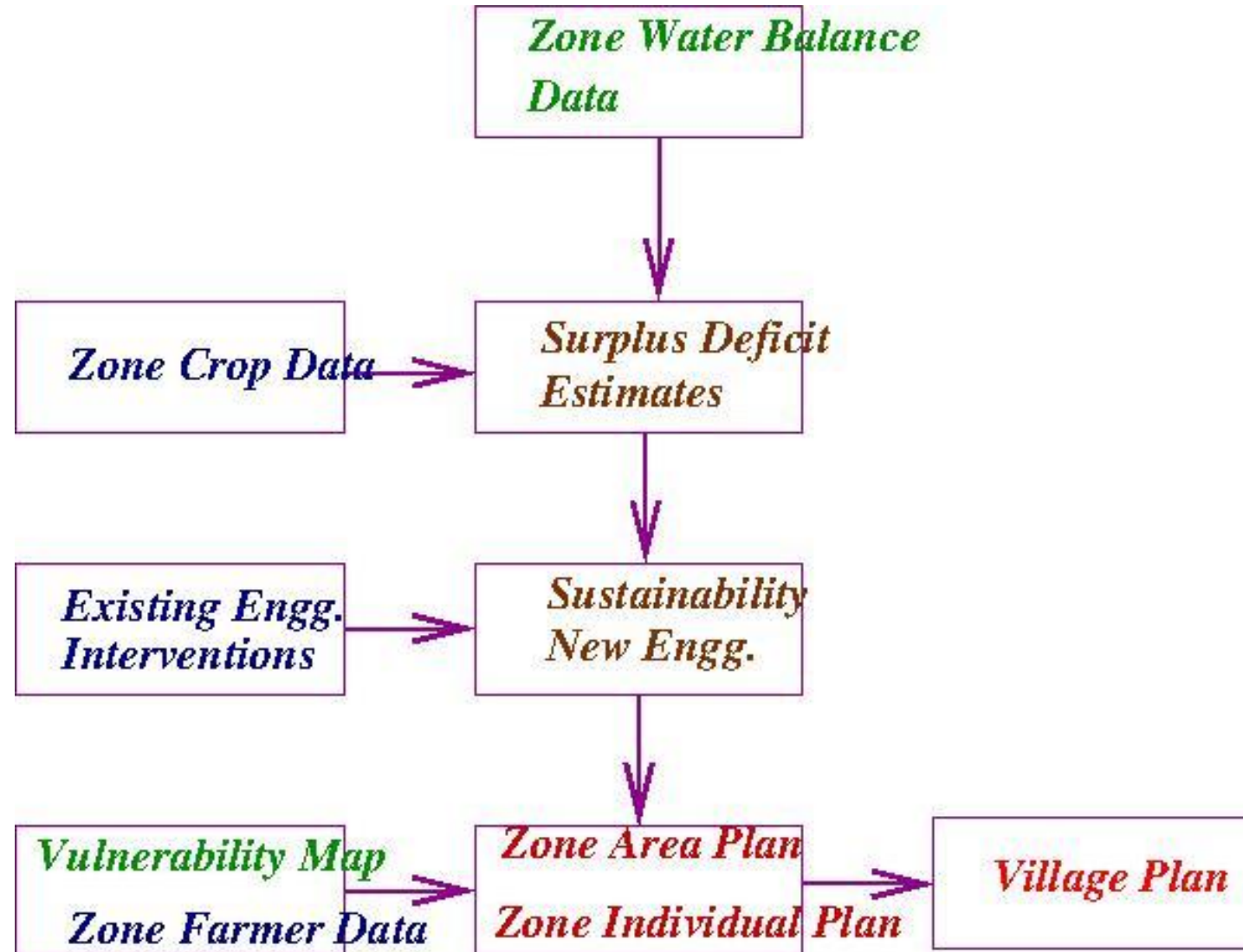


Minutes of Meeting – 11th Nov, GOM-POCRA-IITB

- Issues faced regarding data availability for Water Balance Model
 - model decided to be built on available secondary data
- Detailed survey of sample farmers for model refinement
 - To be a part of microplanning and incorporated into app
- How to take water balance model closer to planning and technical vetting process
 - We took up designing zone level planning process based on water balance model to enable location specific individual and community intervention planning
 - Providing zone level advisory on feasible runoff management
- Integrating the model with microplanning process and app
 - To enable scale up in POCRA districts

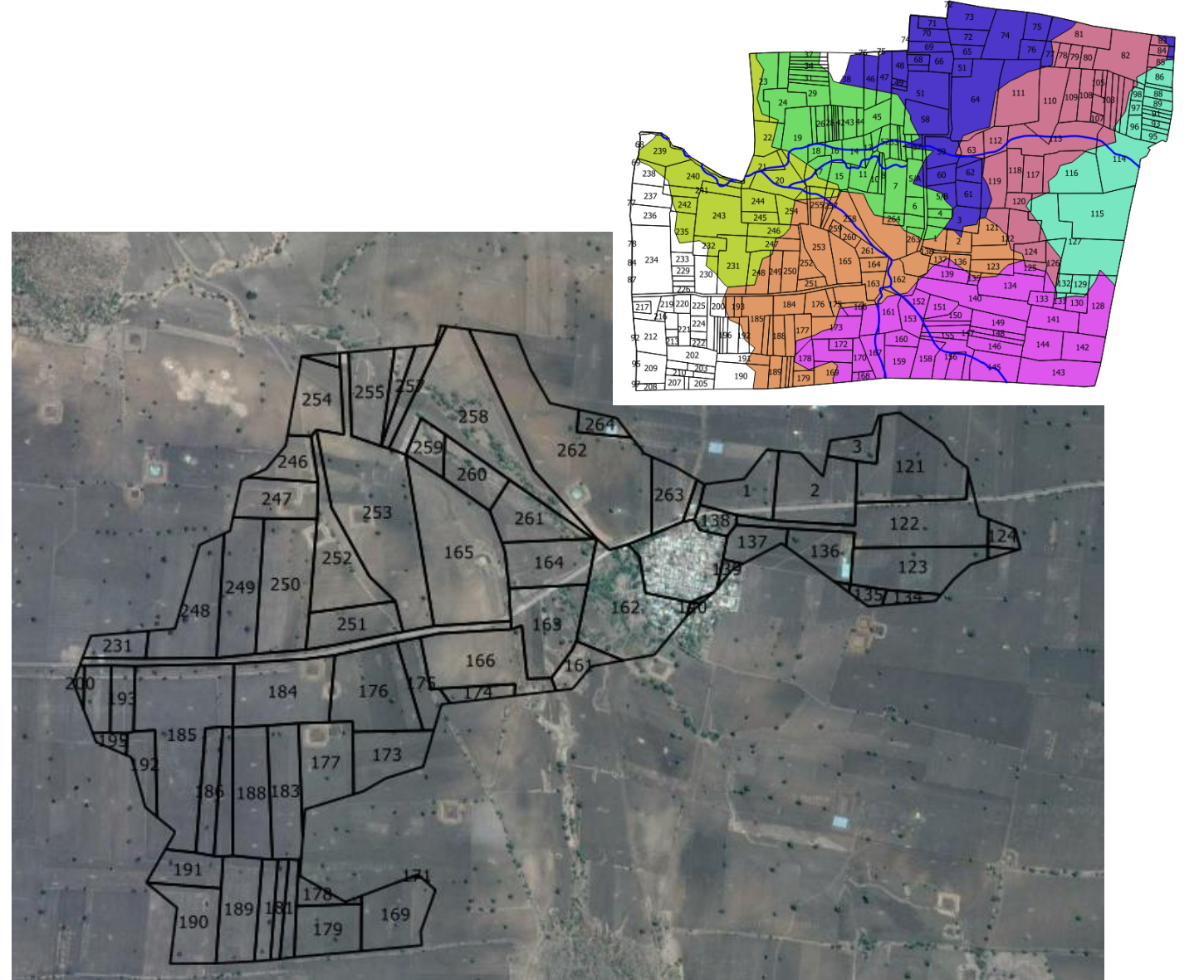
Zone Level Survey – Pilot in one Zone of Yeulkhed Village

Basic Outline of Process



येउलखेड झोन - पाण्याचा ताळेबंद उदाहरण

- झोन पातळी वर पाण्याचा ताळेबंद
- येउलखेड - ८ सबझोन (पाणलोट) मध्ये विभागले
 - प्रत्येक सब झोन माधे ३० – ५० गट नो.
 - **Zone Total Area: 125 Acre**
 - **Zone Agricultural Area: 110 Acre**



येउलखेड मधील प्रमुख समस्या

- खरपान पट्ट्यात असल्यामुळे भूजल स्रोत सिंचनासाठी अनुपयोगी
 - खरपण पट्टा असल्याने भूगर्भात खरे पाणी
 - अधिक वापर केल्यास मातीची प्रत बिघडते
- येउलखेड माधे clayey मातीचा थर असल्यामुळे मातीची पाणी साठवण क्षमता गाठल्यावर पावसाचे अधिक पाणी अपघावाचा रूपात वाहून जाते
 - पाझर कमी होते, भूगर्भात पुनर्भरण कमी होते
 - खरीप संरक्षित सिंचन आणि रबी साठी अपघाव नियोजनाची गरज
- येउलखेड मधील जमिनी जवळपास सपाट असल्याने व उतार कमी असल्याने शेत तले घेताना योग्य जागेची निवड करणे आवश्यक
 - land treatment आवश्यक

Issues Identified and Need for Zone Level Planning

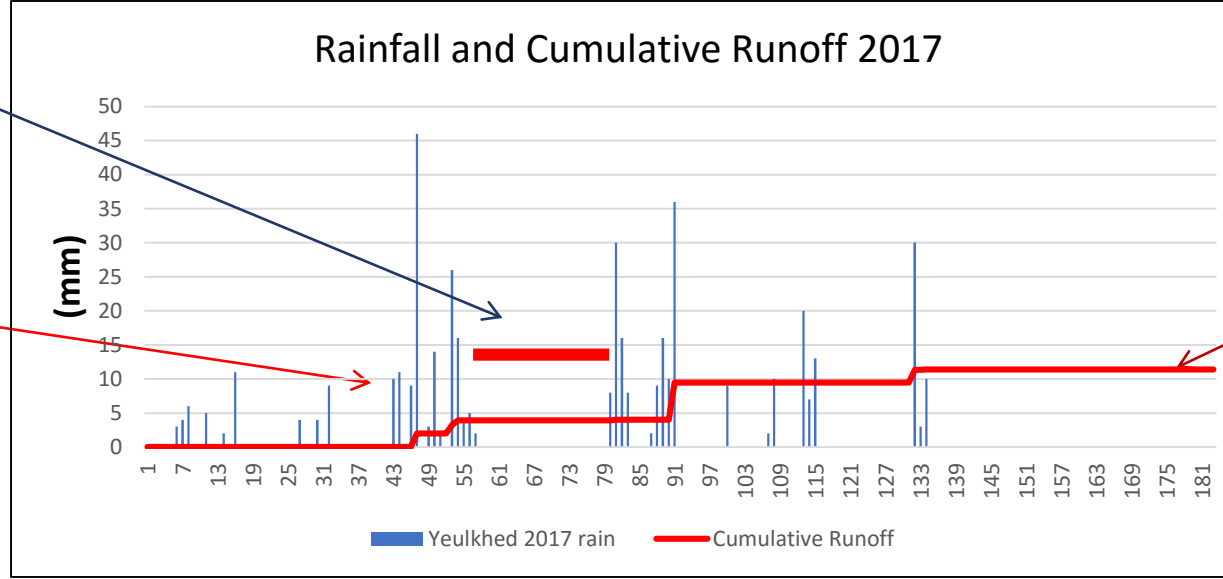
- Proximity to stream can have both positive and negative impacts
 - Both individual and community management structures are required
- Individual yield depends substantially on Individual assets
 - Matching and understanding of difference in yield and difference in ability to cope is important in locating additional assets
- Additional cropping depends on regional water budget
 - Community assets may need to be increased for additional cropping demands
- Tying up of Kharif and Rabi irrigation requirement to Water Budget and Individual assets is important in providing crop advisory

अपधाव नियोजनाची गरज

पावसाचा खंड -
२२ दिवस

प्रति दिन
पर्जन्यमान

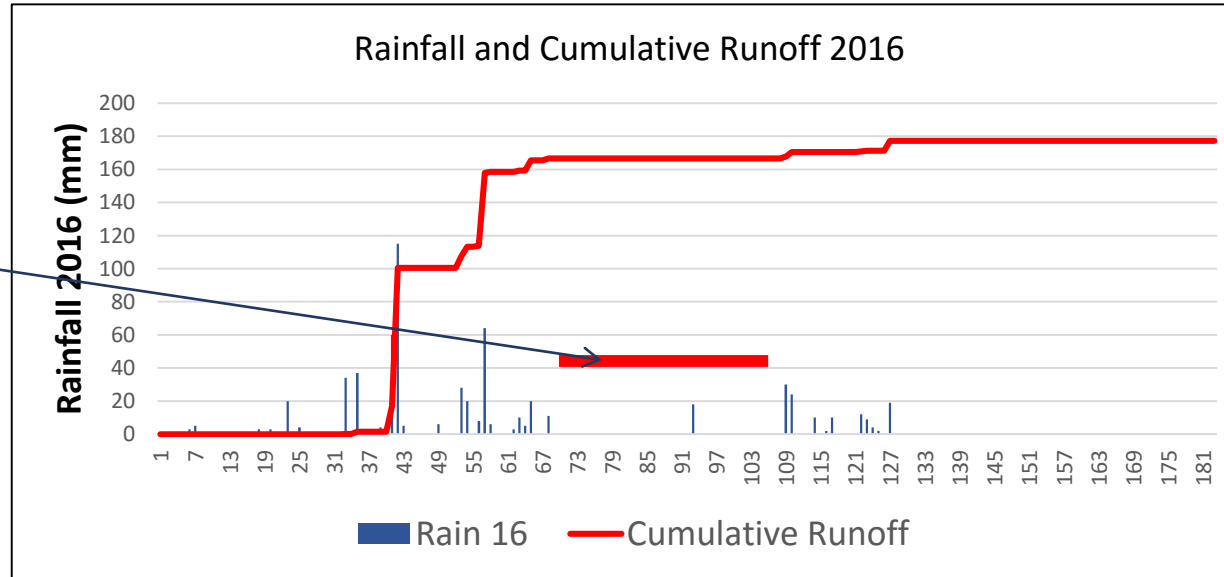
येउलखेड(२०१७)



संकलित
अपधाव
(cumulative)

पावसाचा खंड -
४० दिवस

येउलखेड(२०१६)



ਯੇਤਲਖੇਡ ਮਧੀਲ ਸਦ੍ਯ ਸਥਿਤੀ

Impact on
nearby
Farmponds

Nala
Deepening



येउलखेड मधील सदय स्थिती



Nala Deepening and Widening



Nala without Deepening and Widening



Impact of Deepening on Nearby Farm Ponds



Farm Ponds Away from Nala or streams

basic model data and questions

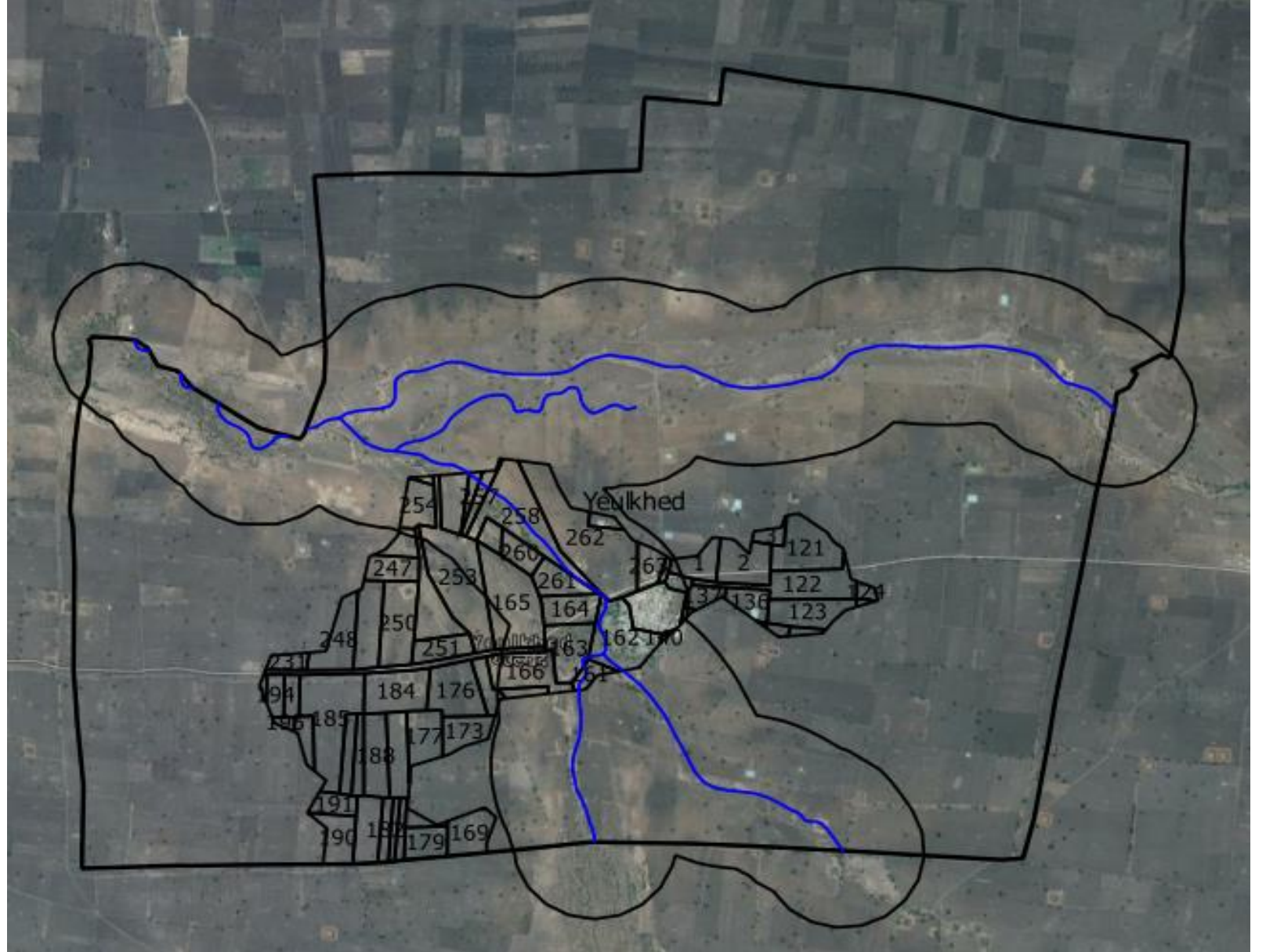
सर्वे साठी दिले जाणारे साहित्य

2017	Soyabean (mm)	Cotton (mm)
Rainfall (input)	435.0	435.0
Runoff	11.7	17.1
Infiltration	423.3	417.9
SM	106.4	45.9
GW recharge	-	-
AET	317.0	372.1
PET (input)	407.8	759.1
PET-AET	90.9	387.1

- सर्वे करायचा आधी अंदाज बांधण्या करिता
- झोन मधील एकूण पिकाची पाण्याची गरज (दोन मुख्य पिके)
 - खरीप साठी पाण्याचा तुटवडा
 - पिकला लागणाऱ्या अथवा दिल्या जाणार्या अधिक पाण्याचा अंदाज
 - संरक्षित सिंचनासाठी अपधाव नियोजनातून पाण्याचा उपलब्धते साठी वाव
 - पिकला लागणारे अधिक पाणी
 - रबी मध्ये मातीच्या ओलाव्यावर पिकांना वाव

अपधाव नियोजनाची गरज

- नदी व नाल्याचा जवळ असलेल्या शेतकऱ्यांचे पुरामुळे नुकसान
 - दुबार पेरणी
 - नदी नाला रुंदीकरण करण्याची गरज
 - इतर जल संधारण कामांना वाव
- नदी नाला नसलेल्या भागात पाण्याची अनुपलब्धता
 - शेत तळ, बोरेवेल
 - Contour bunding



झोन सर्वे मधून भरून आणावयाचा फॉर्म

Name	Gat	Index	Area	Crop	K/L/R	Yield	Internal/ External Water/D eepBore well	Multiple Assets	Extra Water Numb er	possible interven tions

- सब झोन मधील गट नो. सर्वे
 - खरीप पिके
 - रबी पिके
 - पिकांखालील क्षेत्र
 - पिकाचे उत्पन्न
 - पाण्याची उपलब्धता
 - शेताजवळ असलेले पाण्याचे स्रोत
 - अस्तित्वात असलेली जल संधारण कामे
 - खारीप मधील संरक्षित सिंचनासाठी पाण्याची उपलब्धता
 - रबी साठी पाण्याची उपलब्धता

Gat no. wise cropping pattern (Areas are in Acre)

Sr. No	Name	Gat No.	Total Area	Cotton	Soya	Tur	Udid	Moong	Harbara	Jwahr	Others
1	Shiv Shankar Pundker	176	4.5	4.5					4.5		
2	Sandeep jamre	184	9				9		9		
3	Prushotam Punker	175	4	2	2				2		
4	Shashi Punker	2 & 3	7	2	2	2			2		Lilly, Guava – 1
5	Gajanan kisan Khandar	164	6	1.5	2.5				1		
6	Balram	250	4	Bad rainfall					2		
7	Mali	264	3.75				2	1	3.75		Karli – 1
8	Dinkar Rothe	253	6		3		3		6		
9	Balkrishna als	186	2		2						
10	suresh metange	246	7.2				7.2		7.2		
11	Shrikant Pundker	252	2	1.5		0.5					
12	Purushotam	247	10	4	3		3		6		
13	Gopal Pundker	136	9	7			1		1		Guava - 1
14	Sanjay punker	263	21	2	12	2			12		
15	Devilal Metange	177	7.5						7		
16	Bhagwan khnadare	164	1		1						
17	Devanand Khandare	260	2	1	1				1		
18	Mahadev Hanumate	161	12	3	9				9		Ajwain - 3
19	Anil Metange	249	8		6	2					
Total Area under Crop			125.95	28.5	43.5	6.5					

पाण्याचा ताळेबंद

Crop	Area (Acre)	Water Requirement (mm)	Total Water Requirement (Acre - mm)
Cotton	28.5	700	19950
Soya	43.5	450	19575
Tur	6.5	400	2600
Udid	25.2	250	6300
Others	6	250	1500
	16.25	250	4062.5
Total	125.95		53987.5
Average Sub Zone Water Requirement in mm			428.6

Crop	Area (Acre)	Et load (mm)	Total Water Requirement (Acre - mm)
Gram	73.45	250	18362
Total	125.95 Acre		145.79 mm

2017	Values in mm
Rainfall (input)	435.0
Runoff	11.4
Infiltration	423.6
SM	111.1
GW	Nil
AET	312.5
PET (input)	409.8
PET-AET Deficit	97.3
No. of waterings	2
Farm pond (20)	30X30X3 m
Capacity of Farm pond	1350 cum
Capacity of 20 Farm ponds	27000 cum
Total Area	125 Acre
Total Area	500000 sq-m
Capacity of 20 Farm ponds	27000/ 500000 m
Capacity of 20 Farm ponds	54 mm

Continued

[illegible]

पाण्याचा ताळेबंद व महत्वाचे अंदाज

- Is the zonal Kharif load within budget? $kk < rn - rf - ii$?
- Is the zonal Rabbi load within budget? $sm + ii < rr$
- Was the runoff enough to fill the storage? Yes/No
- Can we provide protective irrigation to meet kharip load through run-off storage? Yes/No
- If yes how many irrigations can be provided to kharip crop, given 40 mm water per irrigation?
How many were needed?
- Can we meet Rabi load for Harbara through available soil moisture + GW? $sm + ii > harbhara - pet$?

पाण्याचा ताळेबंद व महत्वाचे अंदाज

- Is the zonal Kharif load within budget? $435 - 11 - 0 = 424$ mm : Aggregate Kharif Load: 428 mm]
- Is the zonal Rabbi load within budget? $111.1 + 0 < 145.8$ mm]
- Was the runoff enough to fill the storage? Yes/No [runoff: 11.4 mm < storage: 54 mm]
- Can we provide protective irrigation to meet kharip load through run-off storage? No [Aggregate kharif load: 428 mm]
- If yes how many irrigations can be provided to kharip crop, given 40 mm water per irrigation? How many were needed?
No
- Can we meet Rabi load for Harbara through available soil moisture + GW? $111.1 + 0 < 145.8$]

Advisory based on Zonal Survey (2017 rainfall)

Nature

Kharif	Rain	Runoff	GW	SM	AET	Deficit	Balance Check
Soya	619	211	26	112	270	132	619
Cotton	619	181	21	60	357	402	619
Tur	619	200	30	100	289	0	619

Area (Acre)	Kharif	Rabbi	Area Rabi	PI req (TCM)	RunOff (TCM)	Rabbi Water Requirement (TCM)	Groundwater available (TCM)
60	Soya	Harbhara	60	19.8	31.7	20.7	3.9
50	Cotton			50.3	22.6		2.6
20	Tur	Harbhara	20	0.0	10.0	7.5	1.5
130			80	70.1	64.3	28.2	8.0

Existing storage	Size	Number	in TCM
Farm Pond	30*30*1.5	19	26

Advisory based on Zonal Survey (2017 rainfall)

Water Balance and Advisory

Demand	Total Water Req.	98.25
Supply	RunOff	64.275
	GW	8.025
	Soil moisture	
Balance		
Existing Storage	Farm Ponds (TCM)	25.6

Storage	Size	Number	TCM
Farm Pond	30*30*1.5	19	25.65
Farm Ponds Possible	30*30*1.5	48	

Advisory based on Zonal Survey (2017 rainfall)

Kharif Crop	Area	Crop Water Requirement	Demand in TCM	Rabi Crop	Area	Crop Water Requirement	Demand in TCM
Soya	44	450	78	Harbara	43.5	250	44
Udid	25	250	25	Harbara	25.2	250	25
Total			104				69
Long Kharif Cotton	29	700	80				
Tur	7	400	10				
Total	36		90				
Available Water	Area	Runoff in mm	In TCM		Area	Gw + SM in mm	in TCM
Runoff soyabean	68.7	11	3	Groundwater + Soil Moisture Soyabean	68.7	106	0
Runoff Cotton	35	17	2	Groundwater + Soil Moisture Cotton	35	46	0
Total			5				36
Engineering Farm Pond		Size	Number		in TCM		
		30*30*1.5	19		26		

- 3 TCM runoff not enough to fill 26 TCM existing farm ponds
- 36 TCM ground water + soil moisture after kharif not enough to satisfy 69 TCM demand for Harbara in rabi

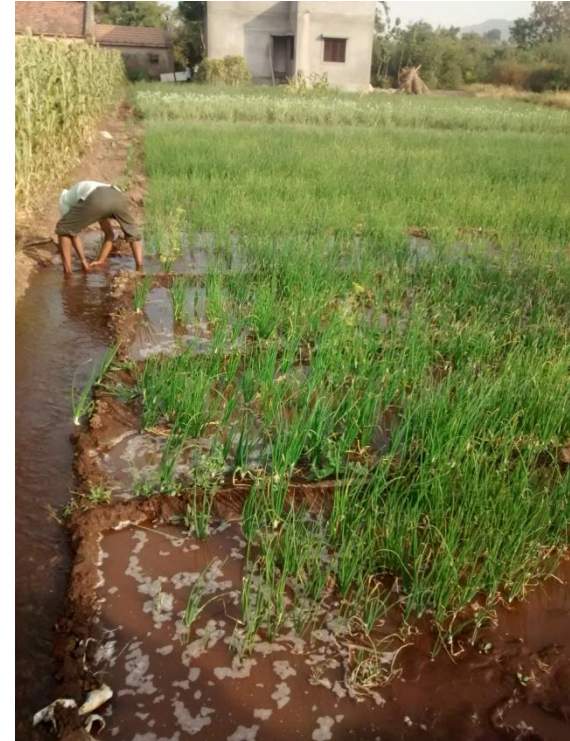
2016 Water Budget

Kharif Crop	Area	Crop Water Requirement	Demand in TCM	Crop	Area	Crop Water Requirement	Demand in TCM
Soya	60	450	108	Harbara	59.84	250	60
Udid	16	250	16	Harbara	16	250	16
Total	76		124				76
Long Kharif Crop							
Cotton	30	700	83				
Tur	24	400	38				
Total			121				
From Budget	Area	Runoff in mm	In TCM		Area	Gw in mm	in TCM
Runoff Cotton	53	180	38	Groundwater + Soil Moisture Cotton	53	80	17
Runoff Soyabean	76	210	64	Groundwater + Soil Moisture Soyabean	76	137	42
Total			102				59

- 64 TCM runoff enough to fill 26 TCM existing farm ponds and run off management can be done for remaining 38 TCM
- 76 TCM ground water + soil moisture after kharif enough to satisfy 76 TCM demand for Harbara in rabi

Steps to Integrate Water Balance with Planning process

- If zonal cropping pattern data with area under crop is made available, zone level guidance for runoff management and cropping can be provided
- List of vulnerable gat no.s will be given based on the output of the model
- If Individual farmer assets and demands are available in next step than each farmer can be assessed by village planning team, based on his vulnerability and availability of assets for provision of intervention



धन्यवाद!