ORIENTATION ON WATER MANAGEMENT FOR CLUSTER COORDINATORS OF EASTERN GHATS

Date: 1st & 2nd September 2023 | **Place:** WASSAN office, Visakhapatnam.

Output 2.2.1 Technical support provided to the MSLMBs to develop a Sustainable Landscape Management Plan in each micro-landscape.

INTRODUCTION:

One of the broad objectives of the SABAL project is to build on existing participatory structures to facilitate sustainable land and water use planning and management in selected areas of high importance for land restoration and biodiversity conservation. It will support local governance bodies to develop sustainable land management plans, and financial plans as a basis for seeking investment for their viable long-term operation.

Five out of 8 micro landscape area are receiving an average of1500 mm annual rainfall and the two landscape regions are fall under draught prone regions. Despite having significant rainfall in ASR and Manyam districts farmers left their lands fallow in Rabi and summer seasons it is due lack of water management system and its absence of local governance systems. In rainy season due to heavy flow of water from hills to lower regions is impacting on soil erosion. It is continuous phenomena of every year due to lack of water ecosystem services. If MSLMBs have a detailed water management plans in hand, then the executive body of MSLMB can explore for fund raising from both state and central government agencies to establish better water management and develop water ecosystem services to protect their crops from dry spells and bring rabi fallows into production to enhance GP level economy.

In the above context, WASSAN was organized two days orientation workshop with cluster coordinators on 1st and 2nd September 2023 in Visakhapatnam.

The primary objectives of the workshop are to build the capacities of the cluster coordinators and local youth as primary stake holders to understand their water resources and participatory assessment of such resources and develop a DPRs for every landscape area.

PARTICIPANTS

Twenty-eight participants from 8 micro landscapes were joined include cluster coordinators, one thematic coordinator and community resource persons (CRPs).

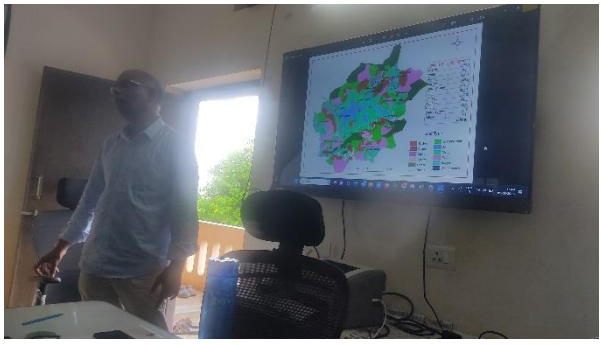
FACILITATORS / WATER EXPERTS

- Mr. C. Bakkareddy,
- Mr. M. Pavan Kumar
- Ms. Tejeswari (GIS expert)

DAY – 1
1. Introductions 2. Project objectives 3. Project Deliverables 4. NGO wise presentations • Resources analysis • Plans
DAY – 2
1. What is Planning? 2. GIS in Water resource planning 3. Reflections on previous day presentation (Data, organising data etc.,) 4. Stream flow estimation 5. Spring discharge estimation 6. Waterbody survey – Mobile app 7. Google Earth – intro 8. Command area situation analysis 9. Action plans • Water body survey • Stream flow estimation • Spring discharge 10. Resources identification on GE • Canals/ diversion drains/ water resources/ other water resources/ Others • Digitisaiton of resources

DAY – 1: *September 1, 2023*

The workshop began with the welcome address by Dr. ML Sanyasi Rao (Sunny), thematic coordinator for RA project from WASSAN. Followed by participants self-introduction. He has introduced the facilitators and set up the context of the workshop and explained the Sustainable Agriculture Biodiversity and Landscape (SABAL) project objectives and partners who have been involved in the project. Kovel, Jattu and CSA are the field partner groups for the implement the program under the coordination of *RySS*. FES is also helping the project in setting up the MSLMBs and developing plans on Commons. WASSAN is resource group to help in policy coordination work and build the capacities of partner groups on participatory planning and Sustainable Landscape Management and Integrated Natural Farming approaches.



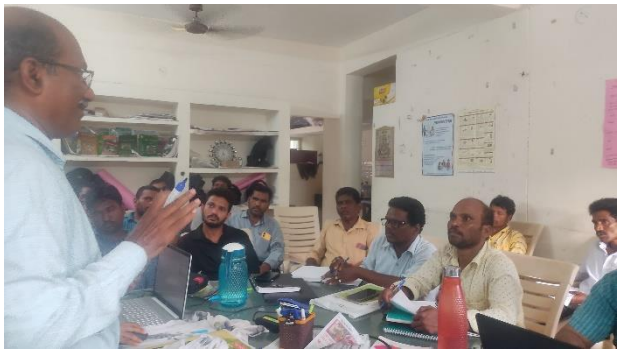
Mr. Pavan Kumar has introduced the two days schedule of the program and took the participants feedback on the proposed topics.

Facilitators have asked the cluster coordinators to share their experiences gained so far from the project, a task was given to participants to prepare a summary of first year achievements in each micro landscape area. Participants were divided into landscape wise for discussion and presented their work.

SUMMARY OF THE PRESENTATIONS

- Landscape wise profile documents were prepared.
- Delineated the micro landscape area through mapping of forest lands, orchard lands, commons, water, and natural resources.
- Capacity buildings for Cluster Coordinators
- Natural farming field trials are on progress like System of Root Intensification on Millets and Paddy, Eco ponds and integrated farming systems include Rainfed fisheries etc.
- RA certification for Nittaput FPO.

The CCs have realized that in the above presentations, there was no proper assessment on existing water resources and its potentiality and conservation measures. The team expressed that there were some springs found in uplands/ forest lands need to assess them to utilize for drinking water purposes. Some of the landscapes have few water bodies that are potential to use for irrigation; however proper assessment is yet to be done. In the recent (20th to 23rd Aug 2023) field visit made by Dr. Sridhar to Kondabaridi landscape, he has reported that the existence of WUA – which is not functional due to breach of the major surface of the water body, which used to irrigate about 270 Acres and need for convergence efforts in facilitating the micro-irrigation systems to cluster of farmers and their farm lands to increase area under vegetable cultivation.



Mr. C. Bakka Reddy has described the fundamentals to keep in mind while facilitating the discussion with communities on Natural resources particularly –on water resources. He has given clarity on water management.

The best water management will be a farmer who has changed/ adapted a suitable cropping pattern in both Kharif and Rabi season as per the rainfall and irrigation sources. Farmers should choose crops based on the water availability and when group of farmers sharing a common water body, then they must follow the crop water budgeting principles. They all sit together do the kharif crop planning as well as rabi too.

The basic questions like.

- Our objective and goals must be clear **why** should work on a particular natural resource it could be a water, forest, common land etc but community must come with their common objective.
- **What** kind of resource (soils, lands) and what are the community solutions to address/ adapt.
- **Who** will be the responsible and who are the primary stake holders etc.

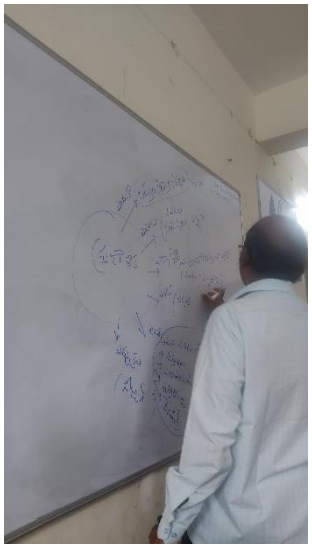
- **How** much? - (time, budget, material, skill & unskilled labour, type of work)
- **When** people come together to ground, suitable season to execute etc.
- **Where** is the project site, any collateral damage issues, existing users and their customary user rights etc.

Major types of water bodies like springs, streams, check dams, canals, farm ponds etc.

When we talk about water, there are 3 major purposes will be highlighted.

- Drinking water for both human and livestock
  - A small water body which has been using for drinking purpose; issue could be accessibility, distance, seasonal availability,
- Protective irrigation
  - Kharif crops are more vulnerable to dry spells.
- Irrigation support
  - Water body that could be a potential for irrigation either through gravity force or lift water for irrigation.

Mr. Bakka Reddy explained about technical assessment of a water resource.



When we conduct an assessment to water body or stream, we have to consider soil type, slope, and percolation quality, then only we can be able to calculate the volume of the water available in the stream. When groundwater is available mostly occur top surface of land or below land surface while digging the ponds or wells while springs are point sources from the small or perched aquifers.

Providing irrigation during dry spells is called protective irrigation. We have to focus on protective irrigation by using existing water resources. While planning, we have to know the depth of the problem/issue. Discussion held on drinking water facilities, very few villages have insufficient facilities. We must plan to utilize existing water resources to save the crops.

The plan includes,

"Recharge, Reuse, Reserve and Recycle principles."

In the tribal area, generally land is categorized into 3 categories Podu, Mettu, Pallam.

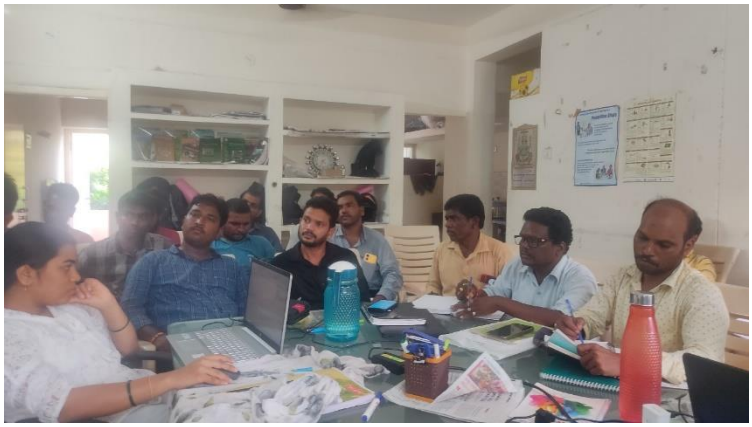
Sno	Type land use	Type of crops	No of days Land cover with crops
1	Podu	Coffee, Cashew plantation lands)	Orchard lands
2	Mettu (dry land)	Millets, pulses, vegetables, ginger and turmeric	250 to 300 days
3	Pallam (wet land)	Paddy and vegetables	365 days

Our aim is to plan with farmers to ensure green cover for more than 300 days on mettu lands and ensuring 365days on wetlands. Crop pattern for Mettu lands is a crucial, farmer has to choose poly crop system include long and short duration crops so that the crop can be on a standing position from June to March and there after going for pre monsoon dry sowing method on first week of May.

Facilitators have given a task to participants that highlight a real issue from any one of the villages of landscape area to share it in the group and closed the first day session.

DAY – 2: *September 2, 2023*

Session started with recapitulation of first day, every one said one point what they discussed yesterday.



Mr. Rajaprakash explained about issue of a pond located in Mondikota of Nittaput landscape area as per the task given yesterday. Pond is serving in Kharif, but it dries up in Summer. He said spring is also located on upper portion of the pond, need to check the possibilities to fill the tank through spring water.

Mr. Manikyam explained about a check dam issue of Velagalapadu of Pinakota landscape, there are many check dams under repair and feeder channels were also damaged.

Mr. Bakka Reddy explained that we must assess the stream while proposing a check and count the number of check dam built on same stream.

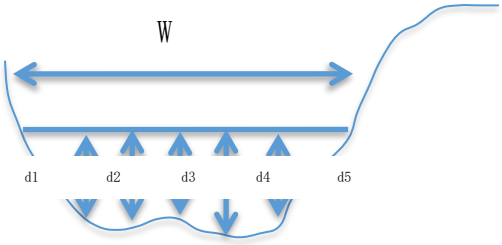
Ms Tejeswari explained the google earth usage in identification of water bodies and given brief orientation on various thematic maps and the importance of digitization etc.

Mr. Bakka Reddy explained how to measure the volume of water in a pond and stream (*see annexure*)

Area of water flow x speed of flow （Distance/ one unit) =Volume （one unit）

Avg (depth) D = (d1+d2+d3+d5+d6+d7)/7

= (0+0.15+0.35+0.45+0.25+0.18+0)/7=0.197 m



Flow Width =W =6 m

Water flow area = Width x Avg depth =6m x 0.197 m

= 1.182 sqm ($m^{2)}$

Velocity = distance of flow in m/travel time second

Ex: Distance =10m, Travel time =18 second

Velocity =10/18=0.556 meter / second

Volume of water flow =Water flow cross section area x Velocity

Ex: Stream water flow =1.182x0.556=0.657m^3/sec (cubic meters/sec)

Volume water flow per one hour =0.657X3600=2365.2 Cum/Hour

Per day water flow = 2365.2x24= 56764.8 m^3

The above river flow can irrigate = 56764.8 m^3/100 m^3=567 acres

Let us consider 80% of the water flow can be tapped=454 Acre (Including of existing irrigation area)

Per acre water requirement per one irrigation = 4048 m^2 x 2.50 cm /100= 100 cum (m3)

= 100x1000 liters= 100000 liters/Acre/one irrigation (1 Cum =1000 Litre)

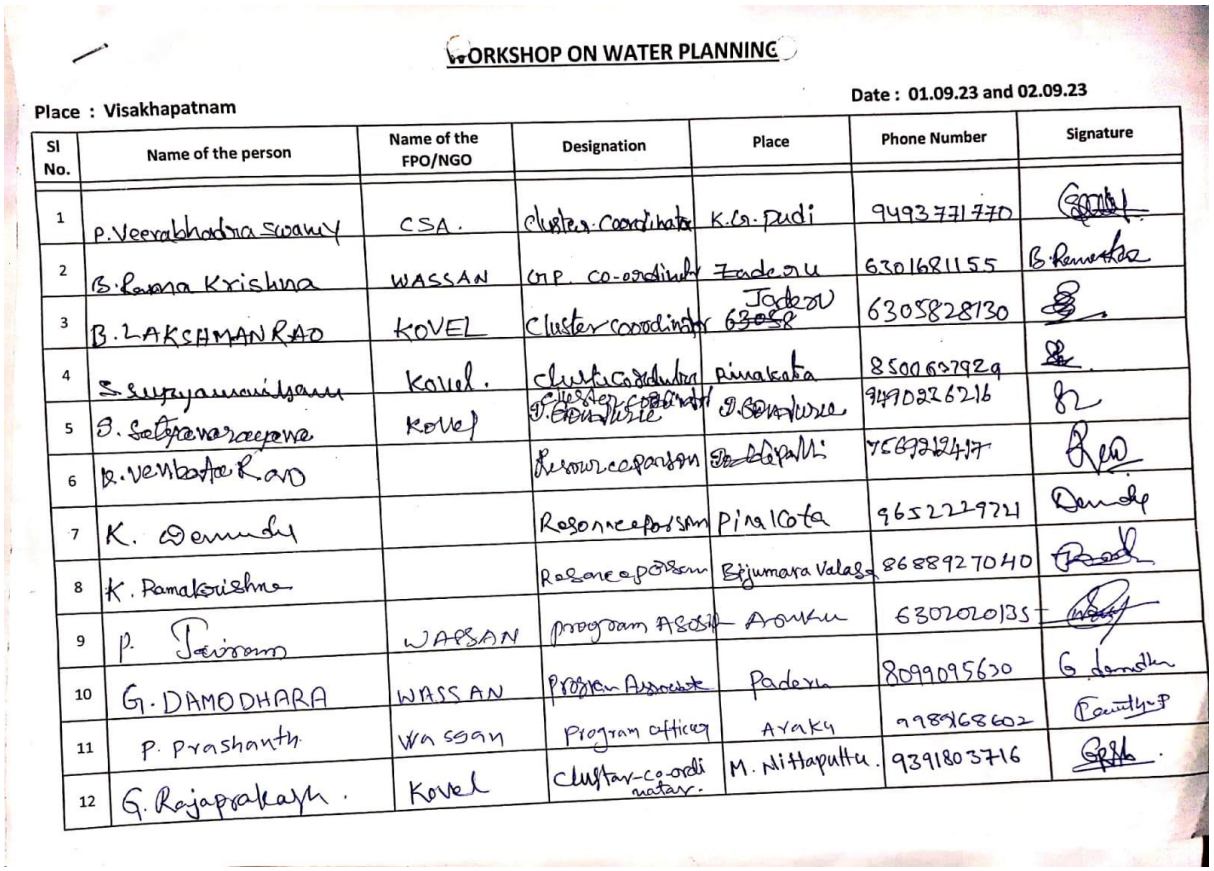
How to calculate spring water discharge through V notch method.

- **Drum Method:**
  - Take known capacity drum and one pipe or bamboo pipe or papaya stick for channelizing the spring water flow into the drum. Measure the drum filling time by stopwatch in seconds.
  - The discharge of spring or pump= Drum capacity in litre / Time taken seconds for full of drum
  - Example: Let's say drum capacity is =100 Litre, Time taken for filling the drum =trial 1=70 second, Trial 2=72 second and trail 3=68 Second
  - Average time taken for filling of drum=(T1+T2+T3)/3= (70+72+68)/3=70 Seconds
  - Spring water discharge or pump discharge =100 litre/70 Second=1.428 Litre per second

ACTION POINTS

- Each person must calculate 3 streams/springs discharge & farm pond by 10th September.
- By 25th September, all villages, all water sources will be calculated and shared to WASSAN office.
- Identify one VO for intensive work based on priority.
- Collect GPS coordinates of all villages and water sources by 15th September.
- Next tentative training planned from 26th to 28th September 2023 will be in the field area.

LIST OF PARTICIPANTS

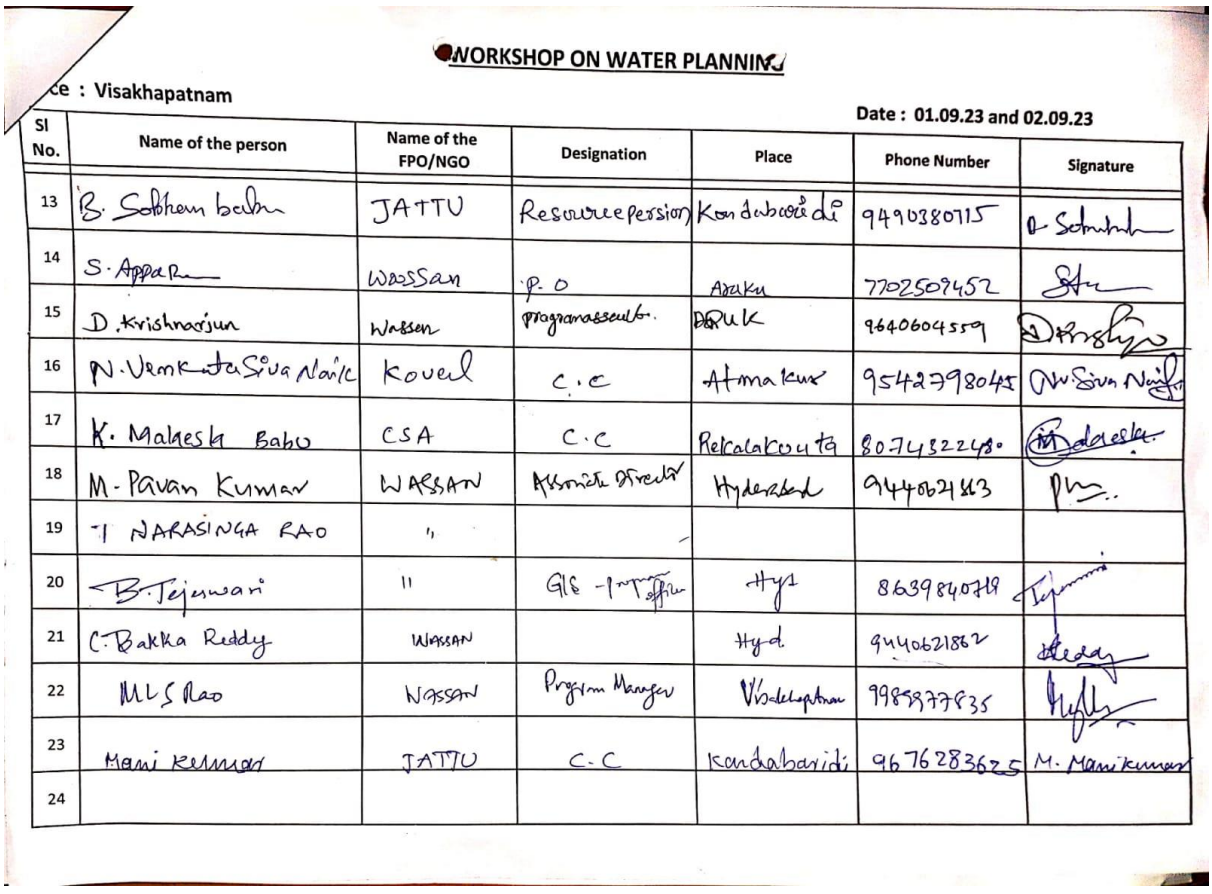


WORKSHOP ON WATER PLANNING

Place : Visakhapatnam

Date : 01.09.23 and 02.09.23

Sl No.	Name of the person	Name of the FPO/NGO	Designation	Place	Phone Number	Signature
1	P. Veerabhadra Swamy	CSA.	Cluster Coordinator	K.Co. Pudi	9493771770	
2	B. Rama Krishna	WASSAN	CRP. co-ordinator	Jaderu	6301681155	B. Ramakrishna
3	B. LAKSHMAN RAO	KOVEL	Cluster coordinator	Jaderu 6305828130		
4	S. Suryanarayana	Kovel.	Cluster Coordinator	Pinakota	8500657929	
5	S. Satyanarayana	Kovel	Cluster coordinator	D. Gondhuru	9490276216	
6	K. Venkata Rao		Resource person	D. Gondhuru	7569212417	
7	K. Devudu		Resource person	Pinakota	9652229721	
8	K. Ramakrishna		Resource person	Bijumara Valasa	8688927040	
9	P. Jairam	WASSAN	Program Assist	Araku	6302020135	
10	G. DAMODHARA	WASSAN	Project Associate	Paderu	8099095630	G. Damodhara
11	P. Prashanth	Wassan	Program officer	Araku	7989168602	
12	G. Rajaprakash.	Kovel	Cluster-co-ordinator.	M. Nithaputtu.	9391803716	



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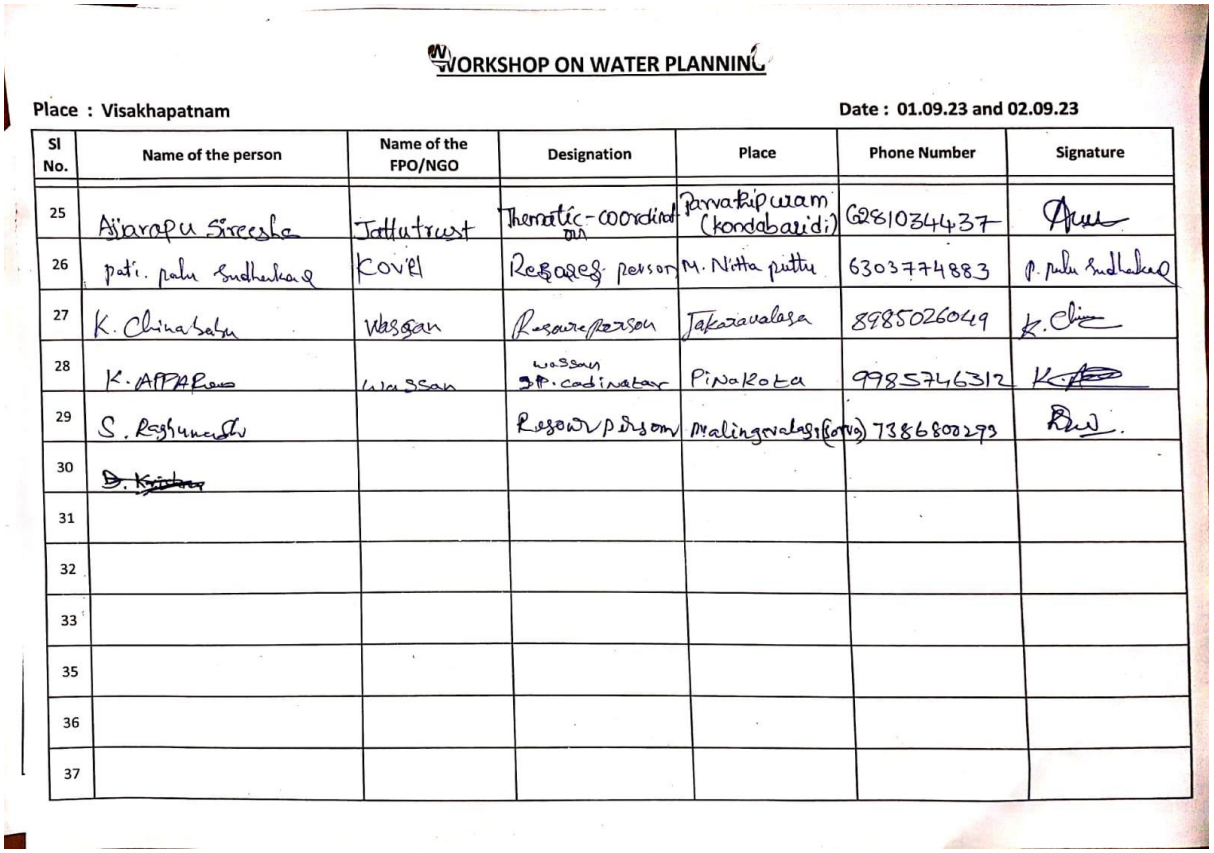
Sl No.	Name of the person	Name of the FPO/NGO	Designation	Place	Phone Number	Signature
13	B. Sobham babu	JATTU	Resource person	Kondaboridi	9490380715	B. Sobhan babu
14	S. Appa Rao	Wassan	P. O	Araku	7702509452	
15	D. Krishnarjun	Wassan	programme asst.	Araku	9640604559	
16	N. Venkata Siva Naik	Kovel	C.C	Atmakur	9542798045	N. Siva Naik
17	K. Mahesh Babu	CSA	C.C	Rekalakoduta	8074322480	
18	M. Pavan Kumar	WASSAN	Associate Director	Hyderabad	9440621883	
19	I NARASINGA RAO	"				
20	B. Tejeswari	"	GIS - Impact officer	Hyd	8639840719	
21	C. Bakka Reddy	WASSAN		Hyd.	9440621882	
22	MLS Rao	WASSAN	Program Manager	Visakhapatnam	9985977835	
23	Mani Kumar	JATTU	C.C	Kondaboridi	9676283625	M. Manikumar
24						



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Sl No.	Name of the person	Name of the FPO/NGO	Designation	Place	Phone Number	Signature
25	Ajjarapu Sireesha	Jattutrust	Thematic-coordinator	Parvatipuram (Kondabaridi)	6281034437	
26	pati. palu Sudhakar	KOVEL	Resource person	M. Nitta puttu	6303774883	P. palu Sudhakar
27	K. Chinababu	Vasgan	Resource Person	Jakaravalasa	8985026049	K. Chi
28	K. APPARao	Wassan	WASSAN SP. coordinator	Pinakota	9985746312	K.
29	S. Raghunadh		Resource Person	Malingavalasa (Parvipuram)	7386800293	
30	~~D. Krishna~~					
31						
32						
33						
35						
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ANNEXURES

Measuring the Flow of a Stream or River

Using the Weir Method (Streams)

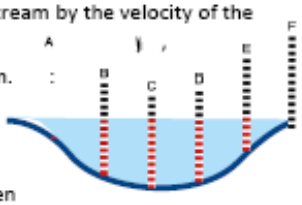
There is a minimum flow required for the Papa Pump to operate. You can measure the flow rate from your stream or spring by the following method:

Use a wide board to dam the stream. Before you place the board across the stream, cut a 'V' shape into the top of the board.

When water flows through the 'V', time how long it takes to fill up a litre jug. E.g., If it takes a second to fill up a litre jug then this equates to 60 litres per minute, which is more than the recommended 50 litres per minute minimum to operate a Papa Pump.

Using the Float Method (Rivers)

The float method (also known as the cross-sectional method) is used to measure the flow rate for larger streams and rivers. It is found by multiplying a cross sectional area of the stream by the velocity of the water. To measure the flow rate using the float method:



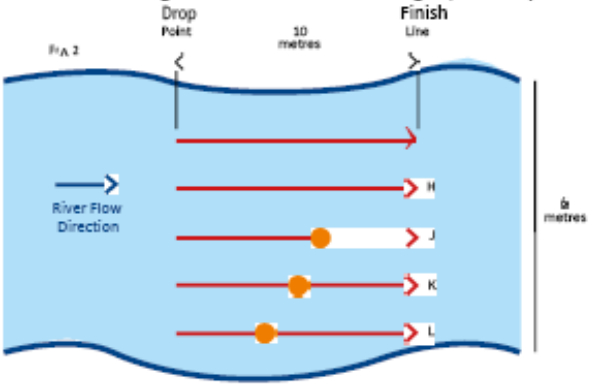
1 Locate a spot in the stream that will act as the cross section of the stream.

2 Using a metre stick, or some other means of measurement, measure the depth of the stream at equal intervals along the width of the stream (see Fig 1.)

3 Once this data is gathered, multiply each depth by the interval it was taken in and add all the amounts together. This calculation is the area of a cross section of the stream.

4 Decide on a length of the stream (in fig. 2 this is 5 metres) and send a floating object down the river- oranges work well.

5 Using a stopwatch, measure the time it takes the float to travel down this length. Repeat this 5-10 times and determine the average time taken for the float to travel the stream. Throw the float into the water at different distances from the shoreline in order to gain a more accurate average. (It usually travels faster in the centre of the river.



6 Divide the stream length (step 4) by the average time in step 5 to determine the average velocity.

7 Since the top of the stream flows faster than the bottom, the velocity found in step 6 must be multiplied by a friction correction factor of 0.85. (For muddy, sandy, or smooth bedrock conditions, use a correction factor of 0.9.

8 The corrected velocity multiplied by the cross sectional area yields the flow rate in volume/time. See below for example.

Example:

Calculating the the cross section area

Measured at intervals of 1 metre

Depths (fig1): A= 0.2m B=0.6m C=0.75mm D=0.55mm E=0.3m F=0

Average: 0.2 + 0.6 + 0.75 + 0.55 + 0.3 + 0 = 2.5m ÷ 6 (number of intervals) = 0.4 metres

0.4 metres x 6 metres (width of river) = 2.4m² (cross section area over 1 metre)

Calculating the the velocity

Measured over 10 metres with 5 measurements at metre intervals across the river.

Time to travel 10 metres (fig2): G= 30sec H=23sec J=15sec K=24sec L=29sec

Average: 30 + 23 + 15 + 24 + 29 = 121secs ÷ 5 (number of intervals) = 24.2 seconds

Adjust for frictional loss: 24.2 x 0.85 (see step 7) = 20.5 seconds (velocity)

Calculating the flow rate

The flow rate is 2.4m² x 20.5 seconds = 0.12 cubic metres/second

which is the equivalent of 120 litres per second or a flow rate of 7,200 litres / minute.

If this is unclear we recommend *'how to measure the flow of a river'* on YouTube or Google.