



**D.A.V. (P.G.) College**  
**Dehradun-248001, Uttarakhand (India)**  
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**(Advertisement No. DAV/NMHS/113 Dated 31.3.21)**  
**Invitation of Expression (EoI) to Undertake Geological Investigations, Plantation and Civil Construction Works of a springshed in a Consortia Initiative funded by NMHS, G.B. Pant National Institute of Himalayan Environment and Sustainable Development (GBPNIHESD), Kosi-Katarmal, Almora, MoEF& CC, GoI, New Delhi led by DAV(PG) College, Dehradun**

**A. Background:**

Under National Mission of Himalayan Studies(NMHS), **G.B. Pant National Institute of Himalayan Environment and Sustainable Development (GBPNIHESD), Kosi-Katarmal, Almora, MoEF&CC, Govt. of India, New Delhi** sponsored project titled “**Water Resource Management through Spring and Catchment Rejuvenation in Uttarakhand for Improving Water Security**” is under progress jointly by TERI-SAS, New Delhi; TERI, New Delhi; Uttarakhand Jal Sansthan, Dehradun, and DAV (PG) College, Dehradun. Based on survey, field investigations, technical data of the area identified, GIS and Remote Sensing outcome and visit of project team in the area of concern, the present area of intervention/ work has been identified and finalized as Khari, Jajal, Near Selupani, Tehri for villagers/ local residents/ population.

The project has been designed for the benefits of a large section of the rural society of the area selected for spring rejuvenation, which is used by Uttarakhand Jal Sansthan (UJS), Dehradun for the supply of drinking and domestic water. It includes the local people, who use the spring water for their daily life. The decreasing discharge of spring is the major concern of administration, stakeholders, and the project team. The rejuvenation of the springs cannot be complete without the participation of the local people and hence the rejuvenation process undertaken for the dried springs of the selected region of Tehri district.

The study aims for rejuvenating the springshed in an area covering approximately 18 sq.km, extended 5 km from north to south and 5.5 km from east and west in the lesser Himalayan terrain of Uttarakhand located Near Selupani, Tehri Garhwal, Uttarakhand. The elevation varies from 750 m to 1900 m from mean sea level. The targeted beneficiary villages are located in south face of hills, which covers 50% of the study area and 50% leeward sides of the hills. It is single springshed that covers multiple micro watershed within 18 sq km.

Selection will be made on “Technical Capacity and Financial Cost basis”. Technical proposal will be evaluated by the panel of experts. Interested agency/company/firm/ bidder shall pay Rs 2,000.00 (Rs two thousand only) as non-refundable proposal submission fee through demand draft in favour of “Principal, DAV (PG) College, Dehradun”, payable at Dehradun.

Interested agency/ company/ firm/ bidder should submit/send the attached format for Technical as well as Financial Bids in separate envelopes sealed in a bigger envelop by registered post or speed post only with covering letter for participating in the EoI work, which should anyhow reach on or before last date i.e. 30.04.2021. The EoI letters received by registered/ speed post after this date will be rejected, therefore kindly send your proposal well in time to ensure your participation in the referred EoI.

**B. Scope of the Work**

(1) Preparation of structure geology (dip/strike, dip amount and rock type with geological sequence) on 1:1000 Scale, study of set of joints and fractures on 250 m interval. In case of absence of exposed rocks, provide the thickness of soils (provide track of GPS enable line traverse mapping in shape file format); (2) Resistivity survey

on 500m interval with interpretation report and all profiles of two conjugative observation; (3) Isotopes survey and analysis report at three or four locations; (4) Plantation work 1000 plants per hectare (New plantation should achieve 3% of total geographical area) and (5) Construction of structures for soils moisture conservation and ground water recharge – Contour trenching, Inwardly sloping terraces, Circular ponds, Semi-circular bunds, Soils and Stone bunds Gabion Structures with use of local stone, sand, and soil, Bunds, Gully plugs with use of stone (Note all structure preferable to use of local earthen material and avoid the use of cement and concrete structures).

**Location:** Near Selupani, Khari, Tehri, Uttarakhand

**Note:** Base map will be provided to the agency selected consisting of springshed boundary, Villages locations, major road map and regular grid spacing of 250m X 250m on 1:1000 scale.

## **C. Technical Details**

### **Task 1: Detailed Structural Geological Mapping Report and Analysis:**

1. Preparation of structure geology, which includes dip/strike, dip amount, surface slope, rock type and geological contact lines with geological sequence on 1:1000 Scale. Base map will be provided to the agency/ company/ firm/ bidder selected with regular grid spacing of 250m X 250m on 1:1000 scale. All the above information is required in each grid. In case of absence of exposed rocks, remarks with geological estimation would be required.
2. Study of set of joints & fractures; fault & thrust and lineament mapping: Study of set of joints & fractures should be covered on regular grid spacing of 250m X 250m on 1:1000 scale. Frequency plots of joints are also required to be submitted. Whereas fault & thrust and lineament mapping should be captured through satellite data interpretation and 100 % validated with ground truth observations. The length of lineament should be accurate with respect to ground estimation using GPS.
3. Thickness of soils and weathered material should be provided on regular grid spacing of 250m X 250m on 1:1000 scale.
4. Visit of each grid-spacing will be confirmed and verified by track point attribute like date, time and hours using GPS. Observation of geological mapping needs to be validated by providing track of GPS enabled line traverse. Selected agency/ company/ firm/ bidder needs to submit raw GPS data in shape file format with waypoint that confirmed the GPS-ID of each grid point and line traverse with 1 minute of interval in Geographical Coordinate System (in Degree decimal) under datum of WGS84.

#### **Geological GIS mapping:**

5. Location of observation point of dip/strike and dip amount value should be captured through GPS and all attributes like strike angle, dip angle, dip amount and surface slope, thickness of soil should be stored in the point attribute table. Geological contact lines, sequence and rock types should also be stored in polygon feature with attribute description. A separate layer of rock type is also required in polygon feature in shape file format.
6. Photograph of each location with location id is required.
7. Grid wise GIS layer is required for set of joints & fractures on regular grid spacing of 250m x 250m in shape file format.
8. Line geometry / feature shape file is required for faults & thrusts and lineaments. There should not be any intersection between two crossing linear features.

### **Task 2: Detailed Resistivity Survey:**

1. Resistivity sounding on any location of regular grid spacing of 500m X 500 m at 1:1000 scale should be done at feasible locations.

2. Colour vertical profile of lithology obtained from each location by resistivity sounding should be submitted with reference to surface elevation. The SRTM 30m data should be used as reference surface elevation.
3. Various underlying rock types, soil types and water tables obtained by resistivity sounding survey is required to be interpolated at 100 m spatial resolution.
4. Interpolated raster surfaces of each rock type, soil type and water table are required to be submitted on spatial resolution of 100m with reference to SRTM surface elevation data for entire study area.
5. A sink fill SRTM 30 meters data will be provided to selected agency/ company/ firm/ bidder.
6. A summary report of resistivity survey should be submitted.

#### **Resistivity survey GIS mapping**

7. Each resistivity site should be captured through GPS, which include location ID, time, date and hours. A point GIS layer should be submitted with elevation / depth value of underlying geological materials like rock types, soil types and available water tables. Here underlying characteristic would be attribute name in the column and each attribute represent depth from reference surface elevation.
8. Interpolated raster surface layer of various rock types, soil types and water tables is required to submit on spatial resolution of 100m with reference to SRTM surface elevation data for entire study area.
9. GIS layer should in *UTM (in meters) with WGS 84 datum & UTM zone 44*.
10. Photograph of each location with location id is required.
11. In the technical bid, providing each instrument specification, product name, precision and standard error of resistivity meters is mandatory during submission.

#### **Task 3: Isotopes Survey and Analysis Report at Four Locations:**

1. After Task 1 and Task 2, the selected agency/ company/ firm/ bidder will be provided/given four locations for Isotope survey.
2. Detailed methodology in 500 words with flowchart should be explained about the same in technical bid.
3. In the technical bid, please provide instrument and material specification, product name, precision and standard error of Isotopes survey, which is mandatory to submit.
4. Expected outcomes: the selected agency/ company/ firm/ bidder needs to provide a report on recharge zone of ground water and vector of isotope traverse.

#### **Isotopes Survey GIS mapping**

5. A vector layer in line feature indicating movement of traverse of Isotope survey indicating time, speed and duration at various nodes for all three/four sites.
6. Region of potential recharge indicating estimation in terms of litre/ minutes in the study area.
7. GIS layer should in Geographical Coordinate System (Degree Decimal) with WGS 84 datum.
8. Photograph of each location with location id is required.

#### **Task 4: Plantation Activities:**

1. Plantation work should be 1000 plants per hectare
2. New plantation should be achieved in 3% of total geographical area covered.
3. Geocoded plantation should be submitted, which explain the geographical location of the plant, type and species of plant and purpose of plant.
4. Purpose of plant could be environmental services, economical benefit, livelihood generation, ritual benefit but most importantly, it should converge with enchantment of groundwater table, reduction soil erosion, moisture retention at micro-scale atmosphere.
5. Sections of species should be based more towards reducing local warming effect and attract moisture from the atmosphere.

- Please submit the list of 10-15 species, which satisfy the reducing local warming effect and attract moisture from the atmosphere in the technical bid.

#### **Plantations Activity with GIS Mapping**

- A point layer should be submitted with geocoded plantation activities with time, date, hour and geocode photograph in Geographical Coordinate System (Degree Decimal) with WGS 84

#### **Task 5: Construction of Structures for Soils Moisture Conservation and Ground Water Recharge:**

The following structure designs (5 no. each) are given for reference, to be finalized/ decided based on after completion of first three tasks (Tasks 1-3) along with the guidelines for various structures, which have been selected for execution on the ground:

- Bunds:** Bunds are to be constructed on the outer periphery of the bench terraces existing in the form of the step fields. The bunds would be made of the soil dug out from the terraced fields; cement is not to be used in any proportion. The dimensions are as given below:  
Base width=1.20m, Top width= 0.40m, Side slopes= 1:1, length = Equal to the length of the outer periphery of the field.  
The top of the bunds is to be vegetated by soil conservation flora plants like vetiver. The bunds should outlet/outlets to outflow the surplus water.
- Gulley Plugs:** Gulley plug with use of local stone. Gulley Plugs are to be constructed in the upper reaches of the existing nalla draining the runoff of the area. Dimensions of the gulley plugs are as given below:  
Height: 0.8 m above the channel bed, Width= 1.5m, Length= Length depends upon the width of the nalla, which is 2.0 m to 2.5m. The gulley plug should extend in the nallah bank about 0.5m each side. The plug is to be constructed out of locally available stones, cement is not be used in any proportion.
- Gabion Structures:** Soils and Stone bunds Gabion structures with use of local stone, sand and soil. Gabion structures are to be constructed across the nallah with gentle slope. The structure is to be constructed by putting the locally available stones in a wire mesh. The dimensions are as given below:  
Foundation depth= 0.5m below nalla bed, Height= 0.9m above nalla bed, Width= 1.5m, Length= As per the width of the nalla bed, which is to be kept less than 7.0m. The structure should extend in the nalla bank by 0.5m each side.  
Specification of the wire mesh: GI Wire 10 gauge, Mesh size= 10.0 X 10.0 cm, Stone size= >225mm
- Contour Trenching:** Contour trenches are to be constructed in the springsheds, where ground slope is more 30%. Staggered type of trenches are to be constructed. Specifications are given below:  
Depth=0.3m, bottom width = 0.3m, top width= 1.2m, Height of the Berm= 0.3m, Side slopes= 1:1 (Upslope side), Side slope = 1.5:1 (downslope side), Contour Spacing=5.0m. The trench is to be planted by trees and the berms are to be planted with the fodder grass.
- Inwardly sloping terraces:** These types of practices can be easily seen in the hilly region specially into the paddy field.
- Circular ponds:** 6 m radius x 2 m depth
- Semi-circular bunds:** These types of structure can be constructed after peeling the soil surface to catch the water. The peeling of the surface is high as 2m long and 50cm wide with interval across a slope to get the water. The pits used to be filled with grass, fodder, fruits and mulches for the trapping of water.

#### **D. Essential Requirements:**

Essential requirements that selected agency/ company/firm/ agency/ bidder should fulfil the followings and should be submitted with technical bid:

1. It should have working experience of Himalayan region or Uttarakhand.
2. It should have at least 3 years IT returns and should have maximum Rs. 25.00 lakhs annual turnover.
3. It must have completed at least ten groundwater related projects/ works, out of which at least one must be in spring or river rejuvenation.
4. It must have hydrogeologist and other team members having relevant qualifications in groundwater investigations with at least 5 years of experience.

**Company should also fulfill the followings:**

5. Should not be back listed by any government / agency / organization (undertaking required)

**E. Formula of Evaluation of Technical and Financial bids:**

The technical score, financial score and final score will be calculated on the basis of formula given below:

1. The Technical Score (TS) and Financial Score (FS) will carry 70% and 30% weightages, respectively
2. Technical Score will be obtained as per ranking matrix based on evaluation by the panel of experts.
3. Financial Score will be calculated as  $100 \times \text{Lowest Bid Value} / \text{Quoted Bid Value}$ .
4. In case of Lowest bid exceeds the sanctioned amount of the project cost under specified head, wherein proposed EoI has been invited, the project cost will be treated as Lowest Bid value including all taxes (GST).
5. Final Score will be calculated as  $TS \times 0.7 + FS \times 0.3$ .
6. Finally, the selected agency/ company/firm/ agency/ bidder will be called to carry out the work under lowest quoted/ allocated amount of the project. In case of first agency refuses to conduct the work under sanctioned amount, the wait listed agency/ company/firm/ agency/ bidder will be offered to undertake the referred works of EoI.

**F. Important Milestones**

<b>B</b>	<b>Important Milestones for Submission by Selected Agency/ Company/Firm/ Bidder</b>	<b>Deadlines to Complete the Work/ Task</b>
1	Task 1: Detailed Structural Geological Mapping Report and Analysis	30 days from the date of award of work
2	Task 2: Detailed Resistivity Survey	45 days from the date of award of work
3	Task 3: Isotopes Survey and Analysis Report	60 days from the date of award of work
4	Task 4 Plantation Activities	90 days from the date of award of work
5	Task 5: Construction of Structures for Soil's Moisture Conservation and Ground Water Recharge	100 days from the date of award of work

**G. Documents to be Attached with Bid on Letter Lead with Stamp:**

1. Details of the agency: Name, Address, Contact details type of the organization
2. Details of Office bearer: Name, Address, Contact details including mobile and e-mail
3. Details of Head of Institution: Name, Address, Contact details including mobile and email
4. Infrastructure: Specification of GIS lab, Geological Lab, Isotope material and instruments specification, Resistivity meters specification and quality parameters.
5. Audited financial statements (Balance Sheets) of last three years
6. Last three years income tax returns (ITR's)
6. Undertaking that the that agency/ company/ firm/ bidder has not been back listed by any government / agency / organization on a letter head of the head of the agency/ company/firm/ bidder.

7. List of completed at least ten groundwater related projects with at least one project of spring or river rejuvenation.
8. List of the professionals: Name, qualification with year of experience based on Tasks 1 to 5 with one page signed biodata, which must have one hydrogeologist and other team members having relevant qualifications in groundwater investigations with at least 5 years of experience.
9. Interested agency/company/firm/ bidder shall enclose a demand draft of Rs 2,000.00 (Rs two thousand only) (including tax) in favour of “Principal, DAV (PG) College, Dehradun”, payable at Dehradun as non-refundable EoI fee.
10. Interested agency/company/firm/ bidder shall enclose an Earnest Money Deposit (EMD) in the form of Bank Draft/ Bank Guarantee worth Rs. 1.50 Lakhs, which shall be refunded/ returned to successful bidder within a week of final/ total payment after submission of overall report of the tasks assigned. For other bidders, the EMD will be returned within a month from date of opening of financial bids.
11. The validity of bid/ offer should be atleast 90 days. Proposal must remain valid for 240 calendar days after the proposal submission deadline.
12. The Principal, DAV(PG) College, Dehradun reserves the right to change/ modify/ amend any or all provisions of this EoI document.
13. Other documents not mentioned above but as per requirement to make your claim/ case/ bid more strong/viable.

## **H. Submission Guidelines**

1. Complete proposal in all in all respect should be submitted BY POST ONLY in favour of “Principal, DAV(PG) College, Karanpur, Dehradun” on and before the last date i.e. 30<sup>th</sup> April, 2021 mentioned in the advertisement only by registered post or by speed post before 5:00 pm. DAV (PG) college, Dehradun is not accountable for any delay of postal delivery services. Any quote/ bid for EoI received after 30.4.2021 will be rejected summarily.
2. Technical Bid (Annexure-1) and Financial Bid (Annexure-2) should be submitted as per prescribed format.
3. Technical Bid (Annexure-1) with all supporting documents should be submitted in sealed envelope with covering letter on letter pad quoting advertisement number and date duly signed by Authorized signatory on each page with stamp (bearing name and designation along with name and address of agency, company/ firm/ bidder) and clearly super scribed on top of envelop as “**Technical BID - NMHS, MOEF&CC sponsored project; Advertisement No. DAV/NMHS/113 Dated 31.3.21**”.
4. Separate Financial Bid (Annexure-2) is required to be submitted with covering letter on letter pad mentioning advertisement number and date, duly signed and stamped in separate sealed envelope clearly super scribe as “**Financial BID - NMHS, MOEF&CC sponsored project; Advertisement No. DAV/NMHS/113 Dated 31.3.21**”.
5. Both Technical bid and financial bid sealed envelopes should be kept in a bigger envelop and should be properly sealed again, which should be sent by registered post or speed post in favour of “Principal, DAV (PG) College, Karanpur, Dehradun”, which should be clearly super scribed on top of envelop as “**Technical and Financial Bids - NMHS, MOEF&CC sponsored project; Advertisement No. DAV/NMHS/113 Dated 31.3.21**”.
6. Sealed Envelops will be opened in the office of Principal, DAV(PG) College, Dehradun at 3.00 pm on 1.5.2021 (Saturday), in presence of all the authorized representatives (written letter required in favour of the representative) of the company/firm/ agency/ bidder participating in the process and whose sealed registered/ speed post letter has been received by the college on or before 30.4.2021 up to 5.00 pm.
7. Time and date of opening of sealed financial bids will be 3.00 pm on 3.5.2021 of successful bidders, who will be qualified technically as per recommendations of expert panel/ PI/ Co-PI’s.

**Dr. Prashant Singh**  
Co-PI, NMHS Project  
Associate Professor Chemistry  
DAV(PG) College, Dehradun  
Email: prashantraj86@yahoo.com

**Dr. Ajay Saxena**  
Principal  
DAV(PG) College, Dehradun

**(Advertisement No. DAV/NMHS/113 Dated 31.3.21)**

**Submission of Expression (EoI) to Undertake Geological Investigations, Plantation and Civil Construction Works of a springshed in a Consortia Initiative funded by NMHS, MoEF& CC, GoI, New Delhi led by DAV(PG) College, Dehradun**

**Annexure 1: Proforma of Technical Bid**

**(At printed Letter pad of the company/firm/ agency/ bidder)**

1. Background (300 words):
2. Understanding of the work task wise (total 1000 words):
3. Details of methodology of each task with list of deliverables as per technical details given in Section C for each of the 5 tasks:
  - Task 1: Detailed Structural Geological Mapping Report and Analysis
  - Task 2: Detailed Resistivity Survey
  - Task 3: Isotopes Survey and Analysis Report
  - Task 4: Plantation Activities.
  - Task 5 Construction of Structures for Soil's Moisture Conservation and Ground Water Recharge
4. Details of Specification of GIS lab, Geological Lab, Isotope material and instruments specification, Resistivity meters specification and quality parameters:
5. Documents to be attached with Bid/ quote of EoI on letter head with stamp:

Note: Please mention enclosure nos. for all required/ desired documents and also attach all quoting the same enclosure no. in support of your claim.

**Signature of Authorised Signatory:**

**Name:**

**Designation:**

**Address:**

**Mobile No.:**

**Email:**

**(Advertisement No. DAV/NMHS/113 Dated 31.3.21)**  
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**Annexure 2: Proforma of Financial Bid**

**(At printed letter pad of the company/firm/ agency/ bidder)**

S.N.	Task	Detail	Unit	Total Units	Unit Rate (in INR)	Amount (in INR)
1	Task 1: Detailed Structural Geological Mapping Report and Analysis	Observation	Regular grid spacing of 250m x 250m	100		
		GIS Mapping	Per point	100		
2	Task 2: Detailed Resistivity Survey	Observation	Regular grid spacing of 500m x 500m	100		
		GIS mapping	Per point	100		
3	Task 3 Isotopes Survey and Analysis Report	Observation	1	4		
		GIS mapping	1	4		
4	Task 4 Plantation Activities	Plantation	1000/ ha	10 ha		
		GIS mapping	1000/ ha	10 ha		
5	Task 5 Construction of Structures for soils moisture conservation and ground water recharge	Contour trenching	1	5		
		Inwardly sloping terraces	1	5		
		Circular ponds	1	5		
		Semi-circular bunds	1	5		
		Soils and Stone bunds Gabion Structures with use of local stone, sand and soil	1	5		
		Bunds	1	5		
		Gully plugs with use of local stone	1	5		
Total Amount (Rs.)						
GST (Rs.)						
Grant Total (in digits)						
Grant Total (in words): Rupees						

**Signature of Authorized Signatory:**

**Name:**

**Designation:**

**Address:**

**Mobile No.:**

**Email:**