

# EXPRESSION OF INTEREST

For

*Preparation of Bathymetric map with Topographic Survey of Kawache (Kopuche) Lake of Kaski and Shey Phoksundo Lake of Dolpa to update its inventory.*

## Consulting Firm/Joint Venture:

.....  
.....  
.....

## Prime Consultant (in case of a JV):

.....  
.....

Employer:  
Government of Nepal  
Ministry of Population Environment  
Department of Hydrology and Meteorology  
Naxal, Kathmandu

December, 2017



**Government of Nepal**  
**Ministry of Population and Environment**  
**Department of Hydrology and Meteorology**

Naxal, Kathmandu

Notice No: 3/HD/DHM/2074-75

First Date of Publication: 15/9/2074

**Expressions of Interest (EOI)**

The Government of Nepal, Department of Hydrology and Meteorology (DHM) invites EOI (Expressions of Interest) for the purpose of short listing the qualified, eligible and experienced Companies/firms and or their joint ventures for **“Preparation of Bathymetric map with Topographic Survey of Kawache (Kopuche) Lake of Kaski and Shey Phoksundo Lake of Dolpa to update its inventory”** works.

1. The budget to this purpose has been allocated by the Government of Nepal (GON) for the fiscal year 2074/075.
2. Experienced, eligible and interested Consulting Firms or companies are invited to submit their EOI, either alone or in joint venture with other firms with a certified copy of Consultancy /Company Registration Certificate, VAT and Tax Clearance (2073/74)/ Tax Return Submission receipt for the last fiscal year.
3. EOI documents could be obtained free of cost from DHM upon request during office hour on all government working days within the 15<sup>th</sup> day of the first date of publication of this notice or can also be downloaded from the website: <http://www.dhm.gov.np>. The instruction to the consultant, prescribed format, evaluation criteria, scope of the work and duration of the study and other details of the project are mentioned in the EOI. Only lead firm may obtained EOI form mentioning the names of all members of Association/JV and submitting Association/JV agreement.
4. Applications for EOI must be clearly marked **“Preparation of Bathymetric map with Topographic Survey of Kawache (Kopuche) Lake of Kaski and Shey Phoksundo Lake of Dolpa to update its inventory”** and shall be submitted in sealed envelopes by companies or their joint venture received by the due date and within the specified time in the presence of the applicant or their authorized representatives. Absence of any applicant (or their authorized representative), however, shall not obstruct or prevent the opening of the EOI in any way, which must be delivered to the following address within the given time below.

Last Date of EOI Submission:- 30/9/2074 12:00 noon

Date of EOI opening :- 30/9/2074 01:00 pm

5. Certified evidences of the client reference indicating satisfactory completion of the projects along with the cost of consulting services in NRs and date of completion of the assignment only will be counted.
6. In case the day of submission of the EOI falls on a public holiday, it shall then be submitted on the following working day at same hour. Only the short-listed Consulting Firms shall be invited for RFP (Request for Proposal). During the RFP process, the consulting firm/companies will be selected in accordance with quality and cost Based Selection procedure (QCBS).
7. DHM reserves the right to shortlist any or reject all of the Firms without assigning any reasons whatsoever. Further information or clarification can be obtained from DHM during office hours.

Procurement Unit  
Department of Hydrology and Meteorology  
Naxal, Kathmandu  
E-mail: [dhmprocurement@gmail.com](mailto:dhmprocurement@gmail.com)  
Website: [www.dhm.gov.np](http://www.dhm.gov.np)

**Preparation of Bathymetric map with Topographic Survey of Kawache (Kopuche) Lake of Kaski and Shey Phoksundo Lake of Dolpa to update its inventory**

**1. INFORMATION ON THE CONSULTING FIRM**

Information shall be provided in the following format. No field shall be left vacant. In case of a joint venture, the same form shall be filled by each of the JV partners separately. The form shall be submitted in the time, date and venue as mentioned in the published notice.

**1. General**

Name of Firm	Address	Telephone	Email	Fax	JV Percent

Out of the above list, ..... will be the Prime Consultant.

**2. Financial Capacity**

Annual turnover over the last three years are as follows. The auditor’s report/tax clearance certificates are attached.

Fiscal year	Turnover (Rs.)

**3. Overall Experience\***

Overall experiences of the firm in relevant work during last ten years are as follows (Work completion certificates are attached).

Name of Project	Project	Client	Contract amount (excluding VAT)	Year of completion	Description of work carried out

**4. Specific Experience\***

Experiences of the firm in related field during last ten years are as follows. Work completion certificates are attached.

Name of Project	Project	Client	Contract amount (excluding VAT)	Year of completion	Description of work carried out

\* The firm/s shall produce certified evidences of the client reference indicating satisfactory completion of the mentioned projects along with the cost of consulting services in NRs and date of completion of the assignment are required for the consideration of that project for evaluation. Sublet works or assignment as a sub consultant shall not be considered for evaluation.

**5. Human Resources**

**Human Resources in the company**

Staff Member	Details	
	Permanent/part time	Name of personals

**7. Other Resources**

Other relevant resources available with us are as follows. The office layout, invoice/bill of equipment/vehicle/software/computer is attached.

Resource	Unit	Total Available	Engaged by Works on Hand
Office area	m2		
Telephone lines	line		
Photocopy, Printers	set		
High capacity Computer	set		
vehicles(Four wheel Drive)	no		

Authorized signature:

Seal:

Date:

## ANNEX 1: INFORMATION TO THE CONSULTING FIRM

### General Information

<b>Purpose of inviting the EOI:</b>	The main purpose shall short-list suitable consulting firms for <b>Preparation of Bathymetric map with Topographic Survey of Kawache (Kopuche) Lake of Kaski and Shey Phoksundo Lake of Dolpa to update its inventory</b> and related products so that proposals could be invited from them only. However, the client may extend the short-list to include additional relevant consulting firms which are capable of giving the desired output.
<b>Format and Signing of Application:</b>	Applicant intending to file an application in response to this EOI should submit an “Application together with the duly completed EOI form providing all the information required therein after signing in by Authorized Representative of Consulting Firm or company (in case of Joint Venture, Authorized Representative of Lead Firm) with Company’s seal in every page of EOI forms.
<b>Minimum eligibility of the firm:</b>	Registered consulting firms/company; registered at VAT office and tax clearance certificates.
<b>Deadline for submission of EOI:</b>	at or before 12 Noon ( 30/9/2074) (NST-Nepal Standard Time) within 16 days of the first publication of the Invitation notice for EOI
<b>Number of copies to be submitted:</b>	Two
<b>Joint Venture:</b>	A firm may apply to be short-listed alone or in joint venture with other firms. However once short-listed, JV partners are unchangeable.
<b>Duration of completion:</b>	Duration to complete the works will be 90 days from the signing of the contract agreement.
<b>Information from the Client:</b>	In due course of time, the shortlist shall be published on the Client’s notice board, at the website: <a href="http://www.dhm.gov.np">www.dhm.gov.np</a> . The client shall mail the short-list to each of the firms/JV submitting the EOI and initiate the process of RFP without waiting for the receipt from the firms that they have received the short-list.

## ANNEX 2: EVALUATION CRITERIA

### (I) Eligibility Criteria (Pass / Fail)

<i>Sr. No.</i>	<i>Eligibility Criteria</i>	<i>Requirement</i>	<i>Compliance</i>	<i>Remarks</i>
1.	Corporate Registration	Mandatory	Yes/ NO	Pass/Fail
2.	Tax Clearance / Tax Return Submission receipt for the last fiscal year (2073/74)	Mandatory	Yes/ NO	Pass/Fail
3.	Vat Registration	Mandatory	Yes/ NO	Pass/Fail
4.	Minimum Years of Standing	The applicant or the Lead partner of J/V applicant must have min. 5years of standing.	Yes/ NO	Pass/Fail

**II) Ranking Criteria (Out of 100%)**

<b>General Experience of the firm (10 marks)</b>	<b>Specific Experience of the firm (60 marks)</b> Excellent = 100%, Very Good = 80%, Good = 60%, Acceptable = 40%, not acceptable = 0	<b>Organization Profile of the firm: in terms of clarity in role and responsibility (15 marks)</b>	<b>Professional competency of the firm Commitment for availability of adequate number and /or experience of professionals as required by TOR (15 marks)</b>																		
<p>Years of Experience in the field of Hydrology (4 marks)</p> <p>Number of assignments carried out in the field of hydrology during last 5 years (6 marks)</p>	<p>Specific experience in bathymetric survey for developing bathymetric maps and topographic survey</p> <p>(Number of assignments, Duration of assignment , volume of assignments in last five years will be counted)</p>	<table border="0"> <tr> <td>Excellent</td> <td>100%</td> </tr> <tr> <td>Very good</td> <td>80%</td> </tr> <tr> <td>Good</td> <td>60%</td> </tr> <tr> <td>Acceptable</td> <td>40%</td> </tr> <tr> <td>Not Acceptable</td> <td>0%</td> </tr> </table>	Excellent	100%	Very good	80%	Good	60%	Acceptable	40%	Not Acceptable	0%	<table border="0"> <tr> <td>Excellent</td> <td>100%</td> </tr> <tr> <td>Very good</td> <td>80%</td> </tr> <tr> <td>Good</td> <td>60%</td> </tr> <tr> <td>Acceptable</td> <td>40%</td> </tr> </table> <p>(Note: Permanent staff – 100%, Temporary staff- 80%)</p>	Excellent	100%	Very good	80%	Good	60%	Acceptable	40%
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NOTE: The consultant should score more than 60 percent on the overall ranking criteria as mentioned above to qualify for short listing

## Project Description:

### Introduction / Background

The government of Nepal started hydrological and Meteorological activities in an organized manner in 1962. Hydrology and Meteorology related organization remained under various Department/Ministry at different time. In 1988 this organization became a separate department with the name Department of Hydrology and Meteorology (DHM).

The Department of Hydrology and Meteorology as titled has principally two branches namely Hydrology and Meteorology. The Hydrology division has been maintaining around 190 hydrological stations all over the country among which almost 100 stations are primary stations. Beside staff gauges some of the stations still have crest stage gauges and water level recorders to measure water level fluctuations in the rivers. Most of the stations have cableway to measure discharge in the river to know the variation of flow during the year. Around 40 hydrological stations has already been automated and others are also in the process of being automatic gradually. Besides monitoring the rivers, snow and glaciers; the hydrology division has also been initiating the studies on lakes to establish a database of the lakes of Nepal.

The Lakes are basically natural resources available for multiple uses. A lake consists of two distinct parts, the basin and the water body. A lake, in other words may be defined as an inland basin filled with water. The water level of a lake is a function of the volume contained in the lake basin. The rate of change of water volume is controlled by the rate at which water enters the basin from all sources minus the rate at which the water is lost by evaporation from its surface and discharged by surface as well as subsurface effluents. The dynamic process of lakes also reflects in a part of its own previous history.

There are lots of lakes within the country from the very low altitudes to the high Himalayas and from the eastern region to far western region. Since last couple of years DHM has been regularly involved in preparing the Bathymetric map of different lakes of Nepal and for this fiscal year also this program has got continuity. This year DHM has planned to conduct this study for the below two lakes:

i) Kawache Lake: Kaski

All the lakes that are located above 4000 meters above the mean sea level are termed as glacial lakes and below that level generally glacial lakes are not found. Despite this general concepts a few years prior this Kawache Lake which is located at just a 2546 meters above m.s.l. has been explored. Due to this unique characteristics, this lake has attracted the interest of different stakeholders including researchers, tourism sectors, educational institutes, government agencies and many more.

ii) Shey Phoksundo Lake: Dolpa

This lake lies in the mid-western development region of Nepal in the Dolpa district. It is at a remote yet accessible and one of the most beautiful lake in Nepal. DHM has already done the Bathymetric survey of this lake two times before on 2004 and 2008. The outcomes of the two reports are little bit different due to which its actual depth is still different in different literatures. The lake is situated at around an altitude of 3600 meters above m.s.l.

In this context due to the above distinctive features and importance DHM has planned to prepare Bathymetric map of “Kawache Lake; Kaski” and the “Shey Phoksundo Lake; Dolpa” in this fiscal year and intends to invite the services of national consultants for the following study.

### Objective

The main objective of these study is to prepare scientific study report of the lakes by carrying detail Bathymetric survey and Topographic Survey of the two lakes using standard eco-sounder and total station or theodolites and other hydro-meteorological investigations and available related information. In particular, the present study is aimed to:



- Carry out Bathymetric survey of the two lakes using standard eco-sounder to measure water depth below water level in the lakes. The eco-sounder should be of sufficient capacity to measure depth of at least 700 m. depth with the accuracy of +/- 15 cm.
- Carry out Topographic Survey around the two lakes to prepare topographic maps with contour lines with interval of 5m. The topographic map shall cover at least up to 25 m vertical above the lake's water level around the lake and up to 10 m height along the river channel for up to 200 m downstream from the lake outlet. Closing error for traverse survey shall not be more than 1:5000 and survey shall be carried out using standard total station or DGPS by experienced surveyor. The point density should be of at least 300 pts. per sq. km.
- To establish temporary bench marks at the proper site of the lakes for reference.
- To carry out Hydrological investigations of the two lakes including discharge measurements (at least 2 at both lakes with possible different gauge heights during the stay at the site) and collect water samples for the study of physical parameters including sediment and water quality of the two lakes.

### Scope of work

The detail scope of the works is as following:

- To carry out water depth survey of the lakes.
- To find out the area, volume and other detail structure of the lakes.
- To conduct topographical survey of the lake surroundings up to 25 meter strip around the lake and up to 10 m height along the river channel for up to 200 m downstream from the lake outlet.
- To identify different reference points and locate them on the map of the lakes.
- To find out relation between the elevation and the storage of the lakes.
- To find out the rate of water & sediments outflow from the lakes to establish a relation between them.
- To fix temporary bench marks at proper site of the lakes for reference.
- To collect water samples of different time for the study of physical components of the water
- Prepare digital GIS map of lake with fine resolution.
- While surveying the lake at least one depth should be taken at least on 20 m X 20 m grid at Kawache lake and 50 m X 50 m grid at Shey Phoksundo lake.
- For verification of the deepest depth, the surveying point density shall be doubled for the area having deepest part of the lake (such area should be at least 25% of the total area)
- For verification, if possible 1% of the total measuring points should be measured manually with a tag real
- Compile different studies done till date by different organizations on these lakes and compare and validate with the current findings

### Area of Study

#### i) Kawache Lake: Kaski

Down to the Annapurna II mountain range exists Kawache Glacial Lake which is yet known lowest glacial lake in Nepal Himalayas with altitude of about 2546 meter above sea level. The lake is also famous in tourism industry of Kaski district. With walking distance of around 8 hours uphill from Sikles village, it lies at latitude of 28° 26' 45" N and longitude of 84° 70' E. **The tentative areal coverage of the lake is 10 hectares which spreads out approximately 300 m East-West and 400 m North-South direction with around 40 m depth.**



The lake is the source region for Upper Madi River where hydropower projects are also developing. The lake monitoring is also should looked upon in context of global warming and climate change. The preliminary development of inventory is

required and frequent monitoring of the lake is essential because it is most prone to melting impact at such a low altitude in comparison to other glacial lakes in Nepal Himalayas.

ii) Shey Phoksundo Lake: Dolpa

Nepal's Western Himalaya is gradually emerging as an enchanting destination for adventure and ethno-cultural tourism. Dolpa (Dolpo in Tibetan) is one such destination offering a diverse nature and a rich culture and lifestyle of over 5000 years. The district of Dolpa is situated in the mid western region of Nepal. At an elevation range of 2700-7000 meters, the Nepal's Western Himalayas traverses Dolpa distinctly resulting in Upper/Inner Dolpo, a vast arid stretch resembling the topography of Tibetan plateau and Lower Dolpo, a semi arid topography with deep gullies and narrow valleys. Shey Phoksundo Lake is around 495 ha in size with a water volume of about 409,000,000 m<sup>3</sup> (1.44×10<sup>10</sup> cu ft) and a discharge of around 3.715 m<sup>3</sup>/s (131.2 cu ft/s). In 2004, The survey by the Department of Hydrology and Meteorology measured the maximum depth of the lake as 145 m in 2004 and 202.41 m in 2008. In September 2007, Phoksundo Lake has been designated a Ramsar site. On the lake's southern end, the village of Ringmo sits on the 30,000- to 40,000-year-old landslide dam that formed the lake. Past the dam, the waters of the lake plunge over a 167 m (548 ft) tall waterfall. **The tentative areal coverage of the lake is around 5 km<sup>2</sup>.**



### **Involvement of DHM staffs**

#### During field visit

During the field visit of the survey the consultants have to incorporate at least 2 technical staffs from DHM in their team to develop the skills of the DHM staffs about the bathymetric survey and also to receive inputs, suggestions and experiences of DHM officials to enhance the survey work.

#### During report preparation

During all phases of report preparation (inception, field and draft) the consultants has to present the report to a panel including hydrologists, other officers from DHM, experts hired by the consultant and invited professionals (third party) at DHM. The DHM experts and the invited professionals (third party) shall then review the reports and give their comments, suggestions and feedbacks within few days which should be incorporated by the consultants in their report. The professionals shall be invited with joint discussion between the consultant and DHM from the related field.

### **Methodology**

The methodology mainly includes the following but not limited to:

Total area of the lake should be divided in to the 20 m X 20 m for Kawache and 50 m X 50 m grids for Shey Phoksundo and fix the survey lines for depth measurement provided at least one point per grid.

- Locate them in the map and in the field

- Fix at least 3 temporary bench marks and bring their co-ordinate (1 bench marks shall be near the outlet and other 2 shall be at the appropriate location).
- Collect water samples of different time for the study of physical components of the water
- Carry out measurements for water depth, area, volume & other detail structure of the lake and also the rate of water & sediments outflow.
- For verification of the deepest depth, the surveying point density shall be doubled for the area having deepest part of the lake (such area should be at least 25% of the total area) and, if possible 1% of the total measuring points should be measured manually with a tag real.
- Conduct topographical survey of the lake surroundings up to 25 meter strip around the lake and up to 10 m height along the river channel for up to 200 m downstream form the lake outlet. (For interpolation of contours, the counter should be of an interval of 5m to 10m; whichever is appropriate as per field condition)
- Directly involve at least 2 Hydrologist from the department in the field works.
- Compile different other research and study on those lakes for comparisons and validation
- Analyze data
- Prepare Bathymetric map
- The resolution of the printed output maps should be of at least 1:10,000 in scale.
- Find out relation between elevation and storage
- Find out relation between the outflow of the water and the sediment
- Determine major morpho-metric parameters including lake area, lake volume, maximum length, effective length, maximum width, effective width, mean width, maximum depth, mean depth, hypsographic curve, median depth, quartile depth, relative depth, slope, contour line length, lake bottom roughness
- Prepare reports (3 copies of Inception reports, 3 copies of field reports, 3 copies of draft reports, and 5 copies of final reports with electronic version)
- After preparation of every report, present them in front of the joint panel of experts from DHM, invited professionals and the experts hired by the consultant and incorporate their comments, suggestions and feedbacks.
- The final report should contain the declaration of the experts hired by the consultant regarding their involvement in the study and report preparation.
- The consultant should also provide DHM all the raw and processed data in editable form.

*The consultant shall submit insurance policy required by Public Procurement Regulation, 2064 as per clause 112 subclause 4 'Ka' for at least the period of 1 year within 30 days of the date of contract agreement.*

Nevertheless, the consultant could add other tasks as deemed necessary in order to complete the works as required.

## **Human Resources**

The following technical experts and assistants are envisaged for the completion of the study:

<u>Description</u>	<u>Quantity</u>	<u>Minimum Qualification</u>	<u>Minimum years of experience</u>
• Team Leader (Sr. Hydrologist)	1 person	Master Level	10 Years
• Hydrologist / Civil Engineer	2 person	Bachelor Level	5 years
• Sr. Surveyor	1 person	Bachelor Level	5 years
• Meteorologist	1 person	Bachelor Level	5 years
• GIS Specialist / Cartographer	1 person	Bachelor Level	5 years
• Surveyor	2 person	Intermediate Level	5 years
• Sub Engineer	1 person	Intermediate Level	5 years
• Office Assistant	1 person	Intermediate Level	5 years

Along with the bio-data of the experts; the consultant should also submit the following declaration document from the experts:

- a) Nature of their involvement in this project (part time or full time)
- b) Letter of commitment of work for this project (duly signed)

### Work Schedule

The duration of the study will be of 100 days; effective from date of consultancy agreement.

Tentative work schedule for the Bathymetric Survey of "Kawache" and the Shey Phoksundo" lakes.																		
Work phase in weeks																		
S.No.	Description of work	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Contract sign and literature collection	■																
2	Preparation of inception Report	■	■	■	■													
3	Presentation of Inception report					■												
4	Payment for the Inception report (1)						■											
5	Field visit						■	■	■	■	■							
6	Preparation of field report										■	■						
7	Presentation of field report											■						
8	Payment for the field report (2)												■	■				
9	Preparation of draft report												■	■	■			
10	Presentation of draft report														■			
11	Payment for the draft report (3)															■		
12	Preparation of final report															■	■	
13	Presentation of final report																	■
14	Handover of reports, CD's and other documents																	■
15	Payment for the final report (5)																	■

### Schedule of Implementation

The time schedule for the completion of the report is as follows:

S.N.	Description	No. of Reports to be Submitted	Due date for submission after effective date of contract agreement
1.	Inception Reports	3 Copies	30 days after the date of agreement
2.	Field Reports	3 Copies	75 days after the date of agreement
3.	Draft Reports	3 Copies	105 days after the date of agreement
4.	Final Reports	5 Copies with CD	120 days after the date of agreement

### Schedule of payment

Schedule of Payment for this work will be as follows:

S.N.	Description	% of Contract Amount
1.	Submission and approval of Inception Reports	20 %
2.	Submission and approval of Field Reports	25 %
3.	Submission and approval of Draft Reports	25%
4.	Submission and approval of Final Reports	30%

## **Output**

**Three/three copies of the Inception Reports** separately for both the lakes should be prepared and submitted to DHM no later than 30 days after signing the contract agreement. The consultant shall present the reports to DHM and other invited professionals for discussion. These reports shall contain the finalized work program and a general approach and methodology that the Consultant proposes to conduct the study. DHM and the invited experts will review the Inception Reports submitted by the consultant and will send its comments if any to the consultant. The consultant shall resubmit two copies of revised Inception Report for each lakes after incorporating the comments. The consultant should also submit insurance policy required by Public Procurement Regulation, 2064 as per clause 112 subclause 4 'Ka' for at least the period of 1 year in this report.

**Three/three copies of the Field Reports** separately for both the lakes should be prepared and submitted to DHM no later than 75 days after signing the contract agreement. The consultant shall present the reports to DHM and other invited professionals for discussion. These reports shall contain the detail field work program conducted with all the details and methodology that the Consultant conducted during the field visit. DHM and the invited professionals will review the Field Reports submitted by the consultant and will send its comments if any to the consultant. The consultant should also submit the raw data to the DHM briefly elaborating the measurement details.

**Three/three copies of Draft Reports** separately for both the lakes should be prepared and submitted to DHM no later than 105 days after signing the contract agreement. The consultant shall present the reports to DHM and other invited professionals for discussion. DHM and the invited experts will review the Draft Reports submitted by the consultant and will send its comments to the consultant.

**Five/five Copies of Final Reports and electronic version (CD)** separately for both the lakes shall be prepared and submitted to DHM no later than 120 days after signing the contract agreement. The report of study for the project shall be prepared comprising all related information as formulated in the scope of work. The consultant should prepare and submit report by incorporating all the comments and suggestions from DHM and the professionals.