



भारत सरकार
GOVERNMENT OF INDIA

PHONE : 0522-2321664, IP No.05001
EPABX:2378796,2327056 Extn. 555
FAX:0522-2336079, 2326241
E.mail: hodnr@gsi.gov.in

No. /GSI/NR/15-CGPB-IX/ 2019

Dated: 12.07.2019

प्रेषक/From

अपर महानिदेशक एवं विभागाध्यक्ष
Additional Director General & HoD
भारतीय भूवैज्ञानिक सर्वेक्षण
Geological Survey of India,
उत्तरी क्षेत्र, वसुंधरा
Northern Region, "Vasundhara"
सेक्टर-ई, अलीगंज, लखनऊ-226024
Sector-E, Aliganj, Lucknow-226024 (UP).

To,

All Members/Special Invitees/
Permanent Members
CGPB Committee-IX
(Geoscientific Investigations)

Sub.: 15th MEETING OF CGPB COMMITTEE-IX ON GEOSCIENTIFIC INVESTIGATIONS
ON 3rd SEPTEMBER, 2019 AT GSI, LUCKNOW.

Sir,

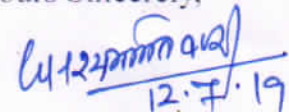
The 15th Meeting of CGPB Committee-IX on Geoscientific Investigations (Geotechnical Investigations) is scheduled to be held on **03.09.2019, 10:30 AM, at GSI, Lucknow**. Participation of all the member organizations/ regions is highly desired to achieve the goals and objectives of the committee.

It is requested to send the Achievements/Highlights for the period from September, 2018 to August 2019 in the prescribed format and Agenda Item, if any, to this office by email on or before 20.08.2019 to e-mail address cgpb.ix.nr@gmail.com. The Action Taken Report (ATR) on the minutes of 14th meeting of CGPB Committee-IX may be submitted by 10.08.2019 by email. Minutes of 14th CGPB Committee-IX meeting are attached and also available on GSI Portal www.gsi.gov.in.

The non-GSI members will be registered in the CGPBIS Module of GSI's Portal on the date of the said Committee Meeting at the venue, if not registered earlier.

Your active cooperation is solicited.

Yours Sincerely,


12.7.19
(Dr. G.S. Tiwari)

Director & Member Secretary
for ADG & HOD and Convenor, CGPB Committee-IX
Geological Survey of India, NR, Lucknow

FORMAT FOR 15th CGPB COMMITTEE-IX (GEOSCIENTIFIC INVESTIGATIONS) MEETING

PROFORMA- A: (Organisations directly engaged in field investigation)

(From September 2018 to August 2019)

I	Introduction		
(a)	Investigating Agency		
(b)	Name of the Project/Item		
(c)	Location (Name of the area, Toposheet no. coordinates)		
(d)	Objective of Investigation		
II	Quantum of Work done		
Nature of Work	Target	Achievement (From September 2018 to August 2019)	Total achievement since commencement
III	Summarised Geology of the area		
IV	Highlights		
V	Future work proposal		

PROFORMA- B: (Organisations not engaged in field investigation)

(From September 2018 to August 2019)

- I. Organisations/ Laboratories engaged in R&D/ any other specialised work may submit their work in running text, highlighting the achievement during the period under review.
- II. Future work proposal

MINUTES OF THE 14th CGPB COMMITTEE-IX MEETING ON “GEOSCIENTIFIC INVESTIGATION”

HELD ON 28th SEPTEMBER 2018, LUCKNOW

The 14th Meeting of the Central Geological Programming Board (CGPB) Committee-IX on Geoscientific Investigations comprising of “Geotechnical Investigations, Natural Hazards, Climate Change, Environmental Geology, Shallow Subsurface Geology and Subsurface Hydrology” was held in the Vasundhara Complex, GSI Northern Region Office, Lucknow on 28th September 2018 under the Chairmanship of Shri Som Nath Chandel, Additional Director General & HoD, Northern Region, GSI, Lucknow and Convener of the Committee. Dr. Prabhas Pande, Additional Director General (Retd.), GSI graced the meeting as a Chief Guest. The senior officers of GSI, NR and representatives from the member organizations stakeholders attended the meeting and actively participated in the deliberations. All the State Units, Regional headquarters and office of the Additional Director General & NMH-IV attended meeting through video conferencing. Director General, GSI addressed the meeting through video conferencing. The list of the participants is appended as Annexure.

1	Welcome Address
1.1	<p>Dr. G. S. Tiwari, Director, PSS and Member Secretary of the CGPB Committee- IX welcomed the Director General, GSI, Chief Guest Dr. Prabhas Pande, Additional Director General (Retd.), GSI, ADG & HoD, NR, delegates, scientists, all the participating members from different organizations, and the officers from the State Units, Regional Headquarters and office of the Additional Director General & NMH-IV attending the 14th meeting of CGPB Committee-IX through video conferencing. The Member Secretary, in his welcome address, highlighted the importance and uniqueness of this meeting as this subcommittee covers under its umbrella, very important themes related to societal issues viz. Geotechnical Investigation, Natural Hazards like earthquakes and landslides, climate change, environmental geology and shallow subsurface geology. He invited all the stakeholders/ participants to share their concern and make full utilization of this platform.</p> <p>He then requested the Director General GSI, to address the house.</p>
1.2	<p>Director General, GSI welcomed the Chief Guest, all the senior offices of GSI and distinguished delegates from all the participating departments and organizations to the 14th meeting of CGPB Committee. He emphasized the importance of CGPB Committee-IX meeting as it is a pre-CGPB meeting and would help in formulation of field season programmes, policies of GSI and identification of gap areas for future course of action in the coming years. He brought to the fore the latest activities of GSI bearing direct relevance to the society i.e., a team of 26 nos. of geoscientists has been constituted for field study in the wake of recent Kerala floods. He apprised the delegates that GSI is very keen and eager to share its experiences with other organizations for promoting “Earth Science” for the use of “State of the art technology and research work”. He urged the house to come up with implementable and concrete recommendations to be taken up in time bound manner.</p> <p>He invited the delegates from all the participating departments and organizations to voice their concerns. Dr. O. P. Mishra, Director, Ministry of Earth Sciences (MoES) opined that the Geological Survey of India should establish a “Centre for Quaternary Studies and Palaeoclimate Research” as per the resolution of Geological Survey of India in the year 2014, and more so because India is receiving accolades on global platform for the same. Dr.</p>

	<p>Harish Bahuguna, Head, Geology and Environment, UJVNL, apprised the house about association of GSI in Lakhwar engineering geology project in Uttarakhand. Responding to this DG said that GSI in principle agrees to take up the project. Shri R. K. Singh, Scientist D, CPCB deliberated that 08 nos. of highly contaminated sites have been identified in the country by CPCB, of which two were from Uttar Pradesh, namely Lucknow and Kanpur. He appreciated GSI for excellent database, which was put to use in this study. The representative of DGM, Nagaland drew the attention of the house towards the severe cases of landslides in Nagaland, and sought for considering Nagaland as a special case when addressing the landslide issues. DG, GSI urged NMH-IV to take care of the same.</p>
1.3	<p>ADG and HOD, welcomed the Chief guest, delegates and the GSI community. Summarizing the activities of GSI under Mission –IV, he stated that GSI always endeavors to address the societal issues and is eager to share the database and collaborate with other state-of-the-art technology and research in the geo-environmental and natural hazards domain for effective management of the earth system and its resources. He expressed his hope to see the meeting serve as an excellent platform for updation and enhancement of current understanding of various facades of themes of the 14th CGPB Sub-committee-IX.</p>
1.4	<p>The Chief Guest Dr. Prabhas Pande, ADG (Retd.) thereafter was welcomed to grace the house with his words. The Chief Guest expressed his pleasure to be invited by GSI. He began with appreciating the video-conferencing technique. He thereafter categorized his talk in three subtopics. Speaking about the diminished number of officers deployed in Engineering Geology Division compared to that of the few years back, he stated that though change should not be feared, GSI should not lose its core strength. He also had a word of advice for GSI regarding the NLSM project. Citing the completion of NLSM by 2020, he urged GSI to have future course of action ready for the work force after its completion.</p> <p>Talking about earthquake studies he advised GSI to not ignore the small magnitude earthquakes as their effect on surface is no less, and they must be documented sincerely. Regarding active fault mapping, he expressed his happiness that a lot of work has been done in this domain. He further praised that GSI is very rich in providing base maps, and must come forward and get associated with active fault studies. He advised against working in isolation and emphasized that active fault mapping of entire country can be done only by coordination. On seismic microzonation, he urged that seismic micro-zonation should not just be of academic interest but should percolate down to the society as well.</p> <p>DDG, Hyd, stated that guidance of Dr. Prabhas Pande should always be sought, especially in VAQ. He apprised the house that Telangana has high fluoride values and therefore, for FS 2019-20 items have been proposed for identification of geogenic causes. Regarding Kerala floods, he informed that items are to be taken up. HOD NR suggested taking up geomorphic studies in association with environment. NMH-IV stated that NR is the backbone when it comes to engineering projects. Regarding landslide studies, he apprised that site-specific meso-landslide studies are being taken up on the request of agencies.</p>

2	<p>Follow up action on the recommendation / suggestions of the 13th CGPB Committee IX meeting</p>
2.1	<p>On para 2.1 of minutes of 13th meeting regarding signing of MoU between GSI and NRSC on glaciological studies, the reply from NRSC is still awaited. The representative of NRSC is not present in the meeting to respond.</p>
2.2	<p>On para 2.4 of minutes of 13th meeting regarding Early Warning Systems for Landslides in Uttarakhand under GSI- DTRL collaboration, Shri Mridul Srivastava, Suptg. Geologist informed that after getting approval from competent authority collaboration is extended for another 2 years (field season 2018-19 and 2019-20). Installations of monitoring pillars have been completed and process of installation of sensors is under progress. He further informed that all geological work in Narendranagar area has been completed and the drilling points will be assigned in a week. The drilling work will be started in a few days after assigning the bore hole locations. The Chairman instructed to submit status note on work component and installation of early warning system to Northern Region office at the earliest.</p> <p>Dr. Prabhas Pandey raised the issue of SOP / common methodology for landslide studies (macro, meso and micro scale) for quality control. Shri Pankaj Jaiswal, Director, M-IV told that draft SOP for all scale landslides has already been prepared it is under review.</p> <p style="text-align: right;">(Action : Dy. D.G., SU: Uttarakhand)</p>
2.3	<p>On para 2.12 of minutes of 13th meeting regarding the collaboration and signing of MoU between GSI and ISR Gandhinagar on seismic microzonation studies of Alwar city, the GSI, WR office informed the house that the modified draft MoU has already been sent to CHQ, on 12.12.2017. The reply from CHQ is still awaited. The SPT drilling has been kept in abeyance as per the recommendation of Term Review Committee. The house unanimously instructed to expedite the matter at the earliest.</p> <p style="text-align: right;">(Action: ISR and Director, Earthquake Geology Division, GSI, WR)</p>
2.4	<p>On para 2.15 of minutes of 13th meeting regarding need of Comprehensive Environmental Geology studies on Pan-India basis as emphasized by the representative of CPCB. Shri Ashish Kumar Nath, Director, PSS-P&M-4, CHQ apprised the house that considering the present mandate and priorities of GSI, taking Pan-India based environmental projects would not be feasible. However, if, the stakeholders require any specific environmental studies (having immediate societal impact) to be taken up by GSI in a specific area, they are always welcome to give their proposal to the respective Regional HoD of GSI for further deliberation on the matter accordingly.</p> <p>The Chairman appreciated the issue raised by CPCB member and informed that huge amount of soil, stream sediment and water sample data have been generated through NGCM programs carried out all over India by GSI. The stakeholders, as per their needs, can utilize this database.</p> <p style="text-align: right;">(Action: CPCB and all stakeholders)</p>
2.5	<p>On para 4.1 of minutes of 13th meeting regarding studies on Kohima-Imphal-Guwahati landslide national highway landslide, GSI, NER office informed that no such request for landslide studies is received. The representative of DGM, Nagaland informed that the highway is under expansion from 2 lanes to 4 lanes and the construction is under progress. The Chairman urged DGM, Nagaland to submit proposal for study of any landslide to GSI, NER. He further instructed GSI, NER to study of such landslides on priority basis.</p> <p style="text-align: right;">(Action: DGM, Nagaland/Mizoram; HOD, GSI, NER)</p>

2.6	<p>On para 4.3 of minutes of 13th meeting regarding quality of seismometers installed, it is informed that SGDRPC has installed upgraded version of seismographs (Trillium 240) sensors in place of Trillium 40 sensors. At present 10 remote sites, seismo-geodetic observatories are in operation with upgraded sensors. The SGDRPC is planning to extend the network by installing the latest higher version of seismographs.</p> <p>Dr. O. P. Mishra, NSC, MoES said that SGDRPC is collecting very good quality and urged to connect the seismo-geodetic network to national network of NCS-MoES. He stated that sharing of the data is the need of the hour as it will be very useful. The installation of seismographs should be in gap areas. Dr. K. Jayabalan, DDG, M-IVA&B, CHQ replied that all care has been taken in to consideration regarding expansion of networks. The monitoring of all stations are 24 X 7 bases and every data generated has been uploaded on portal after an event.</p>
2.7	<p>On para 4.4 of minutes of 13th meeting regarding publication of the seismic microzonation of Delhi by BIS serving as base document and uploading of digital Seismotectonic Atlas of India on OCBIS Portal in public domain Dr. O. P. Mishra, NSC, MoES replied that the seismic microzonation of Delhi has been already submitted to BIS. The seismic microzonation in 4 more cities has already been started. Dr. Prabhas Pande, ADG (retd.) emphasized the data generated by GSI during microzonation of those cities mainly drilling and SPT, noise / MEQ survey and MASW (if available) are very crucial and must be used by MoES. Dr. Ram Jivan Singh requested to MOES for providing list of cities in which MoES is planning to carry out seismic microzonation studies.</p> <p>On the issue of uploading of digital Seismotectonic Atlas of India on OCBIS Portal in public domain Dr. K. Jayabalan, DDG, M-IVA&B, CHQ office, replied that it has already been uploaded in the GSI portal for public viewing and use and will be updated from time to time. Dr. Prabhas Pande emphasized the importance of digital Seismotectonic Atlas of India and said that the release of the document in upcoming CGPB meeting, so that people can recognize the commendable work done by GSI.</p> <p style="text-align: right;">(Action: NCS, MoES)</p>
2.8	<p>On para 4.5 of minutes of 13th meeting regarding medical geology issue prevalent in about 15 villages of Srikakulam district of Andhra Pradesh. Here, people of age group 20-40 years die of kidney failure. Dy.D.G & RMH-IV, SR, informed that an item of medical geology addressing geogenic factors of the problem has already been taken in FS 2018-19 and the pre-monsoon samples were collected.</p> <p style="text-align: right;">(Action: Dy.D.G & RMH-IV, SR)</p>
2.9	<p>On para 4.6 of minutes of 13th meeting for providing 1:10,000 scale geological map of area around Almora, Uttarakhand for rejuvenation of springs, ADG & HOD, GSI, NR replied that GSI has 1:50,000 geological map of entire India and 1:25000 scale of above area. The geological mapping on 1:10,000 scale can be taken up for the concerned areas under suitable MoU, if needed. However, Director, Engineering Geology, GSI, Dehradun informed that the MoU regarding rejuvenation of springs has already been signed between GSI and CGWB.</p> <p>The representative from G. B. Pant National Institute of Himalayan environment and sustainable development, Uttarakhand enquired about working with GSI on landslide and GLOF studies in Uttarakhand. ADG & HOD, GSI, NR replied that for specific studies GSI is ready to work in collaboration.</p> <p>Dr. Harish Bahuguna, UJVNL, Uttarakhand raised the issue of help of GSI for rejuvenation of Kosi Rivers in Almora district and Rispana River in Dehradun district, Uttarakhand. In</p>

	<p>response to this, Director, Engineering Geology, GSI, Dehradun informed that for Kosi River GSI has already started the work on demand of state government.</p> <p>(Action: G. B. Pant National Institute for Himalayan Environment and Sustainable Development)</p>
2.10	<p>On para 4.6 of minutes of 13th meeting regarding DGM, UP request to arrange training course by GSI for newly recruited Assistant Geologists of DGM, UP, ADG & HoD, NR replied that 7 Assistant Geologists are trained by GSI.</p>
3.0	<p>DISCUSSION AND AGENDA</p>
3.1	<p>Mr. Paras Mahajan, Representative of DGM, Punjab raised the issue on collaborative work in northwestern part of country where cancer cases are on the rise due to uranium contamination of groundwater. They further shows concern over geogenic cause of the problem. Dr. Rajesh Chaturvedi, Sr. Geologist, GSI, NR informed that during FS 202012-14 GSI has already done the work on uranium concentration in groundwater in Malwa Region of Punjab (in parts of Bhatinda and Mansa districts) and report of this is available on GSI portal. ADG & HoD, NR stated that if DGM, Punjab wants the same study in any other specific area they have to approach GSI, Chandigarh or GSI, Northern Region in writing for accomplishment of work in collaboration.</p> <p style="text-align: right;">(Action: DGM, Punjab)</p>
3.2	<p>Representative from GSI, WR elaborated the work carried out by Engineering Geology and Earthquake Geology Divisions and requested for relaxation in norms for carrying out seismic microzonation of cities falling in zone-II of Seismic Zoning Map of India (2002) and for important tourist centres.</p>
3.3	<p>Shri A. Bishwapriya, Director, SU: Bihar, GSI, Patna elaborated the work carried out under sub-themes of committee-IX in Eastern Region and the state of Bihar. Quaternary deposits mostly occupy the state and the issues of societal importance such as engineering, earthquake and environment are very important for the state. He discussed in detail about the Fluoride contamination of groundwater in south Bihar and arsenic along north and south bank of Ganga River along with their lateral and vertical extension. He presented the details of engineering projects where GSI contributed a lot. He also elaborated on the work carried out regarding seismic studies and DGPS geodesy.</p> <p>Dr. Prabhas Pande, ADG (retd.) suggested that there should be guideline for Smart City projects, for these types of assignments, few brainstorming sessions are needed. The surface and sub surface data already generated through various projects of GSI need to be incorporated for Smart City projects. For study of east and west Patna fault the geophysical and geological studies shall be in collaboration as these are subsurface faults and hardly evidences are present on surface.</p> <p>Dr. Pankaj Jaiswal, Director, GHRM, CHQ enquired about subsurface 3D modeling of Smart City projects, which in turn helpful to subsurface constructions such as metro rail.</p> <p>Dr. O. P. Mishra, NCS, MoES informed that MoES will start total subsurface imaging (major component of Smart City projects) during seismic microzonation of cities.</p> <p style="text-align: right;">(Action: SU: Bihar, GSI, Patna)</p>
3.4	<p>Sanjeev Kumar, Director, GSI, Chandigarh elaborated in detail the geotechnical investigations including Sarasvati River project carried out by GSI, Chandigarh. He highlighted the geomorphological and lithological set up at every construction site. He discussed in detail the geotechnical investigation carried out for the Bilaspur-Manali-Leh Railway Line Project of Indian Railway. He further informed the house regarding the safer dam site suggested by GSI pertaining to the water crisis of Shimla. He informed the house</p>

	<p>regarding the work done for Pandoh Dam and Chandigarh-Manali road expansion from 2 lanes to 4 lanes.</p> <p>The landslide projects and projects related with sub-committee themes were discussed in detail.</p>
3.5	<p>Dr. Ram Jivan Singh, Director, GSI, NR raised the issue of active fault mapping and seismic microzonation of cities being also carried out by MoES. The methodology and findings are not uniform for such type of studies carried out by different agencies. To avoid duplication and adopt common standard methodology a mechanism is required. MoES may provide the list of executed/funded items of active fault study and projected items to be taken up in near future to avoid duplicacy and to maintain uniformity in approach.</p> <p style="text-align: right;">(Action: MoES)</p>
3.6	<p>Dr. Harish Bahuguna, UJVNL requested GSI to sign the MoU for reservoir site survey (Rim stability analysis) of Lakhwar Project. For this ADG & HoD, GSI, NR enquired from Dehradun office about the man days required for the study. Shri B. M. Gairola, Director, GSI, Dehradun answered that total 60 days is needed to complete the study. ADG & HoD, GSI, NR instructed to expedite the matter as early as possible.</p> <p style="text-align: right;">(Action: SU: Uttarakhand, GSI, Dehradun)</p>
3.7	<p>Representative from GSI, Nagpur presented in detail the work carried out in central region under this subcommittee themes. He discussed the seismic microzonation of Nasik and river linking project in detail. He further informed that macro-seismic surveys of Amaravati micro-earthquakes were done and data captured through instruments for 10 days.</p> <p>Dr. O. P. Mishra, NCS, MoES suggested to work in collaboration/ coordinated jointly by GSI and NCS-MoES for emergent macro-seismic survey/ field investigation of aftershocks. In case of sporadic occurrences of earthquake in Amravati the survey will be done by different agencies individually. He emphasized to share the data to ascertain the seismogenic cause of this earthquake.</p> <p>NMH-IV, CHQ instructed for prior information to CHQ office is mandatory regarding river linking projects of inter-state or intra-state as these projects are very important for country.</p> <p style="text-align: right;">(Action: GSI,CR, Nagpur and MoES)</p>
4.0	Concluding remarks
4.1	<p>Chief Guest Dr. Prabhas Pande, ADG (Retd.) concluded the session by extending his congratulatory remarks and recommendations. He expressed his pleasure at the successful completion of the meeting through video conferencing and applauded the GSI IT cell, CHQ, and PSS team, NR for the same. He stated that formulation of FSP should not just be an annual ritual and more thought process should be given while formulating the FSP keeping in view its benefits and relevance in the coming 5-10 years. He advised the geologists, especially in the light of Mission-IV activities to make a strong point in writing, if the working terms and conditions are not acceptable, and that they should work only when compatible. He congratulated the GSI team and all the delegates.</p>
4.2	<p>Shri Ashish Kumar Nath, Director, PSS-P&M-4, GSI, CHQ drew the attention of the house towards the neglected 21 very important activity domains out of 26 earmarked activities of CGPB Committee-IX. Substantiating further, he stated that GSI has executed 219 collaborative items during the FS 2016 to FS 2019 (till August 2019) and out of 219 collaborative items, 213 pertain to items related to Geotechnical Investigations (consisting of only 5 activity domains) and ironically only 6 collaborative projects pertaining to the remaining 21 activity domains of Committee-IX. He emphasized upon the importance of all the activity domains of Com-IX for the society and urged to eliminate this skewed domain activity through cooperation and collaboration. Regarding stakeholders, he stated that</p>

	<p>stakeholders should inform GSI beforehand as to what is the work that they want to be done by GSI, as GSI needs to plan the FSP accordingly. He urged to maintain correspondence amongst the stakeholders through-out the year, and stated that the expectations of GSI and stakeholders are mutual. Pertaining to participation by delegates from different organizations, he requested the Chairman and Convener of the CGPB Com-IX and Director, CGPB Secretariat, New Delhi that number of participants need to be increased to deliberate the issues pertaining to Com-IX. He reiterated that out of 46 member/participants in the Com-IX only 13 representatives were present in the meeting which is alarmingly low. He requested to invite delegates from NCAOR, NIO, NIH, Wadia institute of Himalayan Geology, IISc, Bangalore, Anna University, Chennai and other prestigious universities as guest members. He also suggested inviting experts (retired from GSI/University/Central/State organizations etc.) from the field of Geophysics, Geochemistry or other multidisciplinary domains to enhance the quality of discussion. In his concluding remarks, he reiterated DG, GSI's words in giving succinct and implementable recommendations from all the stakeholders to make the meeting a successful one.</p>
4.3	<p>Shri S. N. Bhagat, Director DGCO, congratulated all the participating members and expressed his hope to try to keep up the endeavours with zeal. He welcomed the suggestions made by CPCB, but insisted on the concrete documentation before. He apprised the house that CGPB Secretariat is preparing a list, wherein the new members will be included and the members who have not turned up in the past several meetings will be eliminated. In view of approaching IGC 2020, he invited all the stake-holders to participate and contribute in budgetary provisions also.</p>
4.4	<p>ADG & HOD, GSI, NR thanked all for the successful completion of the meeting. He expressed his pleasure on fruitful technical discussions on all the queries. He apprised the house that all the issues have been recorded and actions will be taken regarding the same. ADG & HOD, GSI, NR and Chairman of the meeting emphasized on following recommendations to be implemented in time bound manner:</p> <ol style="list-style-type: none"> i. Issues of landslides of Kohima, Nagaland to be taken care by NMH-IV and GSI, NER. ii. Regarding training for DGM, Punjab, he instructed the delegate to contact GSI, Chandigarh office or Northern Region for trainings mentioned in the calendar of Regional Training Institute (on portal) as per their requirements. iii. Macro seismic survey along with MEQ studies of earthquakes greater than M 5 in collaboration with NCS, MoES and sharing of data with other agencies involved in such type of studies needs to be carried out. iv. Regarding rejuvenation of streams, he assured that GSI, SU: Uttarakhand will take up the issue. v. The physico-chemical characterisation of surface water bodies and preparation of standard reference of soil of country is the need of the hour. vi. Study of landslide by using 3D laser technique for site specific studies needs to be done. vii. Sharing of information on programme and policies from the participating organizations to avoid duplication of work and to bring quality in the work for national interest was strongly advocated and recommended. viii. Regular inter-departmental interactions via suitable communication media between two consecutive CGPB Subcommittee-IX Meetings to be taken up along with progress of ongoing projects. ix. The Centre for Quaternary Geological & Geomorphological Studies and

	<p>Palaeoclimate Research to be established in GSI, NR shortly and items related to palaeo-climatic studies will be framed in collaboration with NIO, Goa / IIT Roorkee / institutions engaged in similar studies.</p> <p>x. For Smart City projects and seismic microzonation studies by NCS, MoES, the data generated by GSI (during seismic microzonation in the form of drilling MEQ/ noise survey, environmental studies and subsurface quaternary survey in different parts of country) including ongoing projects by other agencies needs to be consulted.</p> <p>xi. The seismo-geodetic network needs to be connected to national network of NCS-MoES.</p> <p>xii. A common methodology should be adapted by different agencies while working on the various aspects/ sub-themes of committee-IX.</p> <p>xiii. Archaeological Survey of India may be included in CGPB Committee-IX as stakeholder to discuss the activities related to archaeology.</p>
	Shri Hemant Kumar, Director, GSI, NR presented the vote of thanks.

List of Participants

Sl. No.	Name	Designation & Organisation
1	Shri Som Nath Chandel	ADG &HoD, GSI, NR, Lucknow
2	Smt. Varsha A. Aglawe	DDG & RMH-IV, GSI, NR, Lucknow
3	Dr. G. S. Tiwari	Director, PSS & Member Secretary , GSI, NR, Lucknow
4	Shri Ashish K. Nath	Director, PSS-P&M-4, GSI, CHQ, Kolkata
5	Shri S. N. Bhagat	Director, CGPB Secretariat, GSI, DGCO, New Delhi
6	Dr. Rajesh Asthana	Director, RS Division, GSI, NR, Lucknow
7	Dr. Ram Jivan Singh	Director, CGPB & RP Cell, GSI, NR, Lucknow
8	Dr. Prasun Jana	Director, M-IV, GSI, NR, Lucknow
9	Shri Hemant Kumar	Director, TC & EG Division, GSI, SU: UP, NR, Lucknow
10	Shri Abhinandan Srivastava	Director, Environmental Geology, GSI, SU: UP, NR, Lucknow
11	Shri Rakesh Mishra	Suptdg. Geologist, Glaciology Division, CGPB & RP Cell, GSI, NR, Lucknow
12	Shri Gautam K. Chakraborty	Suptdg. Geophysicist, Geophysics Division, GSI, NR, Lucknow
13	Dr. Rajesh Chaturvedi	Sr. Geologist, Earthquake Geology Division, GSI, NR, Lucknow
14	Dr. Amit Kumar Awasthi	Sr. Geologist, PSS Division, GSI, NR, Lucknow
15	Smt. Sana Naqvi	Sr. Geologist, Publication Division, GSI, NR, Lucknow
16	Km. Nazia Khan	Geologist, Earthquake Geology Division, GSI, NR, Lucknow
17	Shri Harsh Kumar Singh	STA (G), PSS Division, GSI, NR, Lucknow
18	Shri A. S. Pandey	Sr. Geologist, Geodata Div., GSI, NR, Lucknow
19	Shri S. K. Mishra	STA (G), Geodata Div., GSI, NR, Lucknow
20	Smt. Shalini Maurya	Sr. Geologist, PSS Division, GSI, NR, Lucknow
Delegates from outside GSI		
21	Shri Prabash Pande	ADG (Retd.), GSI, Lucknow
22	Dr. O. P. Mishra	Scientist-F, NCS-Ministry of Earth Science, New Delhi
23	Dr. A. K. Nathani	Scientist-E2, NIRM, Bengaluru
24	Dr. R. K. Singh	Scientist-D, Center Pollution Control Board, Lucknow
25	Dr. S. Sahai	Manager (Ground water), UP Jal Nigam, Lucknow
26	Shri Vikas Ranjan	Scientist-C, CGWB, Lucknow
27	Dr. Rajesh Prakash	Scientist-F, National Center for Seismology
28	Shri Ashutosh Tiwari	Scientist ,GB Pant National Institute for Himalayan Environmental & Sustainable Development, Almora, Uttarakhand
29	Shri Wepre Wetsah	Asstt. Geologist, Nagaland State Disaster Management authority (NSDMA), Home Dept. Govt. of Nagaland
30	Dr. R. A. Yadav	Advisor, Aqua Explore, Lucknow
31	Dr. Harish Bahuguna	Head, Environment and Geology Cell, UJVNL, Dehradun

32	Shri Paras Mahajan	Asstt. Geologist, DGM, Punjab
33	Shri Gagan	Mining Officer, DGM, Punjab
Members from GSI participated through Video conferencing		
34	Dr S. Raju	ADG and Head M-IV, CHQ, Kolkata
35	Dr. K. Jayabalan	DDG, M-IVA&B, CHQ, Kolkata
36	Shri S. Shome	Director, M-IV, CHQ, Kolkata
37	Dr Pankaj Jaiswal	Director, GHRM Cell, CHQ, Kolkata
38	Dr. O.P. Singh	Senior Geophysicist, M-IV, CHQ, Kolkata
39	Shri Janak Raj	DDG & RMH-IV, GSI, NER, Shillong
40	Shri M.K. Kaistha	Director, EG and EQG Div, GSI, NER, Shillong
41	Shri Brij Kumar	ADG & HoD, GSI, WR, Jaipur
42	Shri K K Naik	DDG & RMH-IV, GSI, WR, Jaipur
43	Shri P. C. D. Mony	Director, GSI, WR, Jaipur
44	Shri D. Bhattacharya	Director, PSS, GSI, WR, Jaipur
45	Smt Priyanka	Senior Geologist, Mission-IV, GSI, WR, Jaipur
46	Shri Abhishek Anand	Senior Geologist, GSI, WR, Jaipur
47	Shri Krishna Kumar	Senior Geologist, GSI, WR, Jaipur
48	Dr. Ravindra Kumar	DDG & RMH-IV, GSI, CR, Nagpur
49	Shri M. V. Dakate	Director, GSI, CR, Nagpur
50	Shri Dhruvdyoti Chakraborty	Suptdg. Geologist, GSI, CR, Nagpur
51	Shri K. Premchand	ADG, GSI, SR, Hyderabad
52	Dr. S. K. Tripathi	DDG & RMH-IV, GSI, SR, Hyderabad
53	Shri D.D. Bhattachatra	DDG, SU:Bihar, GSI, ER, Patna
54	Shri A. Bishwapriya	Director, SU: Bihar, Patna
55	Shri G.C.Kandpal	DDG,SU:PHP, GSI, NR, Chandigarh
56	Shri Sanjeev Kumar	Director SU:PHP, GSI, NR, Chandigarh
57	Shri Rajesh Joshi	Director, SU: J&K, GSI, NR, Jammu
58	Shri Vijay Shivgotra	Director, SU: J&K, GSI, NR, Jammu
59	Shri B. M. Gairola	Director, SU: Uttarakhand, GSI, NR, Dehradun
60	Shri Bhupender Singh	Director, SU: Uttarakhand, GSI, NR, Dehradun