

FIRST MEETING OF SUBCOMMITTEE – X OF CGPB ON FUNDAMENTAL AND MULTIDISCIPLINARY GEOSCIENCE

The first meeting of newly constituted CGPB Committee X on Fundamental and Multidisciplinary Geoscience was held in the Conference Hall of 15 A & B Kyd Street Building of GSI, Kolkata on 22nd July, 2009. Shri Amitabha Sarkar, Convener and DyDG (CGL) chaired the meeting and Shri N.K. Dutta, DG, GSI, was the guest of honour. The meeting was also attended by Dr. B. Chattopadhyaya, Member Secretary, CGPB and Dy.DG, PPM; Shri J. Singh, Sr.DyDG, STSS; Dr. N.K. Roy, DyDG, Geochemistry; Smt. Bhanumathi Ramakrishnan, DyDG, CHQ; Shri M.M. Swamy, Dy.DG, Eastern Region; Shri M.V. Rao, DyDG, CGD, and other senior officers from various Regions and Wings of GSI.

Dignitaries from other institutions who participated in the meeting are:

- Dr. N.C. Mehrotra, Director, BSIP.
- Dr. Y.J. Bhaskar Rao, Scientist G , NGRI.
- Dr. M. Baba, Director, CESS.
- Dr. U. Prasad, General Manager, KDMIPE (ONGC).
- Dr. R.S. Mishra, Suptdg. Geologist, KDMIPE (ONGC).
- Shri Arun Kalra, Head-Business Development, De Beers India Pvt.Ltd.
- Shri Aswin Rao, Chief Manager, Geology, ACC Ltd.
- Dr. Pulak Sengupta, Professor, Dept. of Geology, University of Jadavpur.
- Dr. Abdul Matin, Professor, Dept. of Geology, University of Calcutta.

MINUTES OF THE FIRST MEETING OF SUBCOMMITTEE – X OF CGPB ON FUNDAMENTAL AND MULTIDISCIPLINARY GEOSCIENCE HELD ON 22ND JULY, 2009, AT GSI, KOLKATA

- 1.1 The meeting was held in the Conference Hall of 15 A & B Kyd Street Building of Central Headquarters, GSI, Kolkata. Shri Amitabha Sarkar, Dy. Director General, CGL, and Convener, welcomed the member delegates and invitees from GSI and other institutions. In his welcome address, he stressed on the significance of CGPB Committee X in the present scenario and thanked MoM for introducing Committee- X as a constituent of the CGPB framework. He briefly touched upon the various terms of reference of the Committee. He thanked all the member institutions and permanent invitees for their very useful response to the questionnaire circulated before the meeting and added that the response to the questionnaire and the deliberations during the meeting would act as guidelines for future activities of the committee.
- 1.2 Shri Neetish Kr. Dutta, Director General (c.c), GSI, while heartily welcoming all the participants, gave a brief account of the activities of different laboratories of GSI and their role in various programmes concerning Fundamental and Multidisciplinary Geoscience. He stressed the need for specialized manpower to carry out fundamental geoscientific research. He requested all the participants to develop a format to record biodata of all personnel engaged in Geoscientific research for uploading in the GSI Portal.
- 1.3 Dr. B. Chattopadhyaya, Dy. Director General, PPM, elaborated on the basic purpose and motto of CGPB and traced its history since inception. He emphasized the need of capacity building for carrying out fundamental research, especially in the field of mineral exploration, environmental studies and interpretation of data generated during

geophysical and geochemical mapping programmes. He stressed the need to evolve modalities for free sharing of database and expertise between various institutions for meaningful progress in the field of geoscientific research.

1.4 Shri Jaswant Singh, Sr. Dy. Director General, STSS, reiterated the issues presented by Dy. Director General, PPM, and stressed the need to adopt a result-oriented and purposeful approach to researches in the field of Fundamental and Multidisciplinary Geoscience.

2. Discussion on Agenda items: Present domains of Earth Science Research in India/ Data Sharing/ Training/Availability of sophisticated instrumental facilities/ Inter-Institution Collaborative Research etc.

2.1. Dr. U. Prasad, General Manager and Dr. R.S. Mishra, Suptdg. Geologist, KDMIPE, ONGC, appraised the house of the present research interests of ONGC which are: (i) Integrated Basin Studies and Basin Modelling, (ii) Studies in Remote Sensing, Sedimentology, Palaeontology, Palynology, Petroleum Geochemistry and Petrophysics, (iii) Gravity-Magnetic-Seismic Data Interpretation, (iv) Exploration Acreage and Property Evaluation, (v) Resource Appraisal and Long Term Exploration Planning, (vi) Coal-Bed Methane and Gas Hydrate Exploration. Dr. Prasad also presented an account of the various sophisticated instrumental facilities available in the laboratories of KDMIPE, Dehradun

2.2. Shri Amitabha Sarkar, Dy.DG (CGL) said that ONGC has enormous data on various sedimentary basins and whether these can be shared between various institutions undertaking research in the field. Dr. Prasad said that ONGC data is normally kept secret because of industry competition but some data can be shared for specific research proposals.

2.3 Shri Neetish Dutta, Director General (c.c), GSI, wanted to know whether data generated by ONGC can be uploaded in the Portal. To this Dr. Prasad said that the data generated by ONGC in various projects are highly confidential and cannot be routinely shared in the portal. However, he added that ONGC and GSI could enter into a MOU for data sharing and collaborative research in selected domains (Action: GSI, KDMIPE).

2.4 Dr. B. Chattopadhyaya, Dy.DG (PPM) and Member Secretary, CGPB, said that GSI would like ONGC to open up facilities for imparting advanced training on Basin Analysis, Geophysical and Seismic Data interpretation etc. He opined that the Training Schedule could be worked out by ONGC and made known to other organisations so that they can participate. He also requested ONGC to extend their Laboratory facilities to other organisations.

2.5 Dr. Y.J. Bhaskar Rao, Scientist-G, NGRI, said that ONGC has lots of under-sea and inland deep drill cores and ONGC should share such samples for interlaboratory research.

2.6 Prof. Pulak Sengupta, Jadavpur University remarked that ONGC should open up research collaboration with other organisations.

2.7 Dr. N.C. Mehrotra, Director, BSIP, also stressed the need to have collaborative research for the benefit of scientific community.

2.8 Dr. U. Prasad, General Manager, KDMIPE, ONGC, responded to all the above requests by saying that ONGC would discuss such matters internally and would come up with modalities for research collaboration and training for capacity building in the field of Fundamental and Multidisciplinary Research. (Action: KDMIPE, ONGC).

2.9 Shri A. Kalra, Head – Business Development, De Beers Pvt. Ltd., wanted to know whether GSI data would be made available to other organisations. To this, the Convener replied that significant amount of data would be available in GSI Portal for sharing.

2.10. Dr. N.C. Mehrotra, Director, BSIP, presented a brief account of the research activities of BSIP in the following major thrust areas: (i) Early Life, Atmosphere and Oceans, (ii) Fossil Land Plant Communities, (iii) Integrative Micropalaeontology, Biopetrology and Organic Facies, (iv) Quaternary Palaeoclimate, Vegetation Dynamics, Sea Level Changes and Anthropogenic Influence, (v) Polar and Planetary Events and (vi) Researches in the frontier fields of Palaeobotany. He outlined the various sophisticated instrumental facilities available in BSIP.

2.11. The Convener requested Dr. Mehrotra to train GSI officers in the field of Palaeobotany and Palynology. Dr. Mehrotra expressed his pleasure and keenness to train GSI officers in this specialized field. He wanted the Convener to have detailed discussion with him in this regard. (Action: GSI).

2.12. Prof. Abdul Matin of Calcutta University requested BSIP for training students of Calcutta University. To this Prof. Mehrotra replied that BSIP has special programme for training University students. (Action: Calcutta University).

2.13. The Convener said that to create awareness and generating research interest, lectures in frontier domains of Earth Science Research should be regularly arranged by different institutions by inviting experts. This would facilitate sharing of research experience and expertise from academia to various institutions and vice-versa. Prof. Addul Matin (Calcutta University), Prof. Pulak Sengupta (Jadavpur University), Dr. M. Baba (CESS) and Dr. Y.J. Bhaskar Rao (NGRI) welcomed the idea. (Action: All Institutions and Universities)

2.14. Dr. N.C. Mehrotra said that BSIP is eager to work in close collaboration with GSI and requested GSI to help BSIP in field studies to remote areas, as infrastructure to take up studies in remote areas is not available with BSIP. To this, the Convener said that projects in remote segments of the country in the areas of interest of BSIP, whenever taken up by GSI, would be communicated to BSIP so that they can participate (Action: GSI and BSIP).

2.15. Dr. Y.J. Bhaskar Rao, Scientist-G, NGRI, gave a synopsis of the research domains pursued by NGRI in recent years. These include: (i) Multidisciplinary studies (Mapping, Sampling, Geochemical Analysis, Radiometric Dating, Seismic Studies etc) to infer evolution of the Indian lithosphere and Earth's interior (ii) Projects on Sustainable Energy (Exploration of Gas Hydrates, Hydrocarbons, Enhanced Oil Recovery and Surveys for Uranium Exploration) (iii) Exploration for Precious Metals (Gold, PGE, Diamond), (iv) Societal Projects (Earthquake Monitoring, Studies on Seismic Structure, Interpretation of Passive Seismic Data etc), (v) Strategic Studies, (vi) Energy Environmental Studies, (vii) Palaeoclimatic Studies and (viii) Geological CO₂ Sequestration Studies. He also gave an account of the various sophisticated instrumental facilities available with NGRI.

2.16. Dr. Y.J. Bhaskar Rao opined that the age of individualistic research is over and the need of the hour are India-centric major collaborative projects carried out on inter-institutional Consortium type Mode. He stated that GSI has huge basic database on ore deposits but little data on isotopic and other geochemical tracers of ore genesis and these need to be generated through collaborative research. He suggested that collaborative research should be framed on some broad themes, such as, (i) Precise geochronology of cratonic nuclei, (ii) Petrogenetic modelling of rock suites and ore bodies based on studies of both stable and radiogenic isotopes and (iii) Quaternary Climate Research. He stressed that the CGPB Subcommittee should identify major themes and select different groups for different themes and modules, identify personnel, expose them with modern facilities abroad

and induct them in various projects. This, in his opinion, would add up trained human resource. He gave high priority to set up National Speciality Research Centres for Earth Science to tackle frontier areas of Research. The Convener welcomed the proposal and said that setting up National Laboratories with sophisticated instrumental facilities are in the agenda of GSI in the coming years (Action: All Institutions).

2.17. Dr. Y.J. Bhaskar Rao said that NGRI has collaborative projects with many institutions including GSI. He opined that geophysicists are keener to collaborate compared to geologists.

2.18. Dr. M. Baba, Director, CESS, briefed the gathering about the present research interests of CESS, the major domains being: (i) Studies in Geodynamics and Crustal Evolution, (ii) Studies on Natural Hazards, (iii) Coastal Zone Management, (iv) Natural Resource Management and (v) Environmental and Atmospheric Studies. He gave a concise account of the various sophisticated instrumental facilities available with CESS.

2.19. Dr. Baba opined that we should distinguish activity domains of Geoscientists and Earth Scientists. He stressed the immediate need of capacity building to carry out fundamental and multidisciplinary research, as most scientists in different institutions are more than 45 years old. Keeping in view the modern advancement in the field of Geoscience, he emphasized that teaching faculties in Indian Universities should be adequately trained in India and abroad so that they are able to train students for advanced research using sophisticated analytical instruments.

2.20. The convener said that the link between educational centres and institutions should be strengthened and mutual strengths in expertise and infrastructure should be shared.

2.21. Dr. Baba said that very little is done by Earth Scientists in the field of agriculture. He opined that geoscientists could make significant contribution to agriculture. Responding to this, the Convener said that GSI has taken up National Geochemical Mapping as a top priority programme, which will address many of the issues connected with soil geochemistry and therefore, agriculture.

2.22. Shri Aswin Rao, Chief Manager (Geology), ACC Ltd., applauded GSI for generating enormous amount of basic data. He felt, however, that compared to many other Developed Nations, the employment opportunities of Geologists in India are narrowing day-by-day and there is an urgent need to reorient University curriculum to suite the need of the industry. As an example, he said that very few geologists are available with knowledge of environmental rules in vogue but industry face problems of environmental clearance. He added that India has resources but we fail in their optimum utilization because of several constraints. He gave a brief account of the activities of ACC Ltd.

2.23. He opined that GSI should not concentrate only on basic research but also on applied research in the field of mineral exploration and exploitation. He further added that other domains that should be tackled by GSI are: Land use / Land cover mapping from satellite imageries, Cadastral Maps, Geomorphological Mapping, Hydrogeological Studies, Environmental Management of mines, Geotechnical and slope stability studies of mines and Waste Disposal Management etc. The Convener pointed out that GSI is actively engaged in many of the above domains and would take others up with the availability of additional manpower in the coming years. The Convener added that several institutions carry out researches in the field of mineral exploration and exploitation, Mine safety etc like ISM, Dhanbad and that such institutions should be included in this Committee. (Action: GSI).

2.24. Shri A.K. Kalra, Head-Business Development, De Beers India Pvt. Ltd., gave a brief account of the work carried out by De Beers in India. He informed the gathering that all R &

D activities of De Beers are coordinated by Group Exploration, Johannesburg, South Africa. De Beers has ongoing research projects on fundamental geology, geochronology, fundamental and applied geophysics and diamonds. He informed the house that De Beers attaches priority to collaborative research in the countries they are operating. He added that GSI should play the leading role for collaborative Earth Science Research in India.

2.25. Dr. Y.J. Bhaskar Rao of NGRI enquired about focused collaborative research programme between NGRI and De Beers and also whether De Beers can fund / sponsor any Indian Project. The Convener and Dr. P. Sengupta (Jadavpur University) also requested De Beers to collaborate and fund some well-thought of research project. Shri A.K. Kalra stressed that multidisciplinary research on cratonic boundaries in India should be taken up on priority basis in which De Beers can participate. He further opined that Indian universities should prepare students as per the need of the industry (Action: All institutions).

2.26. Shri S.P. Venkata Dasu, Director, PPOD Division, AMSE Wing, GSI, gave a comprehensive account of the research activities presently pursued in the PPOD Laboratory, AMSE Wing, GSI. He stressed the need for proper infrastructural facilities, logistic support and availability of trained manpower for success in the field of fundamental and multidisciplinary research. He further opined that (i) geological maps should be updated on modern thinking, (ii) Neotectonics and Quaternary Research should be given priority and (iii) the schedule of charges of different services rendered by GSI should be reduced so that students can afford to pay it.

2.27. Dr. D.M. Mohabe, Director, Palaeontology Division, Central Region, GSI, pointed out that there is considerable duplication of work in the field of Palaeontological research. He stressed that while formulating research programmes, recent global trends on Palaeontological Research should be first ascertained and then meaningful programmes made. He suggested that the CGPB Subcommittee should coordinate all major programmes of research. He further added that research groups should be given some autonomy to pursue their research interests.

2.28. Prof. Pulak Sengupta of Jadavpur University opined that GSITI should take a programme to train students from various universities. The Convener said that all geologists joining GSI from universities are imparted training for almost a year free of cost. Recently MoM has also decided to train geologists from various State Geology Departments in GSITI free of cost. He added that for specific training purposes, universities could approach GSITI to train their students (Action: All Universities).

2.29. Shri R.N. Patra, Director, Coal Wing, GSI, elaborated on the importance of Coal Petrographic Research. He gave an account of research being pursued by Coal Wing in this field and informed the house that GSI is in a position to impart training in this very specialized field. Dr. Pulak Sengupta (Jadavpur University) and Prof. Abdul Matin (Calcutta University) welcomed this proposal.

2.30. Shri G.K. Pancholi, Director, WR, GSI, stressed the need for deployment of proper personnel for undertaking research projects as all may not be suited to take up research. He stressed the need for collaborative research between universities and various institutions in India and abroad for improvement in the quality of research.

2.31. Shri P. Srivastava , Director, WR, GSI, opined that all data generated in research projects should be kept in computer storage and made accessible to all.

2.32. Shri M.V. Rao, Dy. DG (Geophysics), GSI, while outlining the activities of Geophysics Division, GSI, stated that GSI has collaborative projects with NGRI and the work is going on smoothly. He informed the gathering that students from Andhra and Osmania Universities

have done their project work utilizing expensive instruments and software available in GSI and other universities are also welcome. He added that the Geophysics Group, GSI, is also providing support to Private Agencies on payment basis (MoU). Dr. Y.J. Bhaskar Rao (NGRI) said that GSI and other organisations / institutions can use spare instrument capacity of NGRI to further their research interests.

2.33. Dr. N.K. Ray, Dy. DG, (Geochemistry), GSI, gave a brief account of the activities of the Chemical Laboratories of GSI and the sophisticated instrumental facilities available in the Chemical Laboratories. He said that GSI Chemical Laboratories have already done more than 10 lakh analyses in connection with the NGCM Programme. He stated that the Chemical Laboratories of GSI extend support to students and other organisations also. Prof. Pulak Sengupta (Jadavpur University) regretted that the analytical charges of GSI are rather on the high side. The Convener said that it is better to have joint collaborative projects than getting analysis done on payment basis.

3. Agenda items: Mode of Collaborative Research / Thrust Areas of Research

3.1. Dr. U. Prasad and Dr. R.S. Mishra (KDMIPE, ONGC) emphasized on collaborative projects with GSI on surface mapping and mineral exploration to contribute to National Wealth (Action GSI and KDMIPE, ONGC). The Convener welcomed the proposal and stated that GSI has a long history of collaboration with ONGC. He recalled that in the late seventies, the K-Ar dating Laboratory of GSI, has determined radiometric ages of several samples sent by ONGC.

3.2. Dr. N.C. Mehrotra (BSIP) stated that BSIP has collaborative projects with both ONGC and GSI. According to him, the following domains should be prioritized for research: Palaeoclimatic Studies, Disaster Management and Exploration Strategies to locate Energy Mineral Resources. He added that BSIP is willing to have collaborative research with other organisations.

3.3. According to Prof. Abdul Matin (Calcutta University), the emphasis now should be on Environmental Research, Global Climate Change and Disaster Management (including slope-stability studies in hilly areas).

3.4. Prof. Pulak Sengupta (Jadavpur University) said that research projects on (i) Evolution and dynamics of continental lithosphere, (ii) Metallogeny, (iii) Environmental studies tagged up with Petrology and (iv) High-quality Geochronology and Stable Isotopic Studies should be given priority.

3.5. Dr. Y.J. Bhaskar Rao (NGRI) reiterated the need to develop a Centre of Excellence of Specialized Laboratory Studies with state-of-the-art instrumental facilities (SHRIMP, LA-MC-ICP-MS) for high-resolution U-Pb (Zircon) dating, Stable Isotopic analysis, Trace Element and REE analysis etc. He emphasized collaboration between geologists and geophysicists to unravel dynamics of the mantle and lithosphere. According to him, the domains that need to be studied on priority basis are: Old continental nuclei, Linking up the Himalayas with Quaternary Environmental changes and Correlation of East Gondwana. He advocated taking up a few show-case research projects on transects in other countries to highlight the capabilities of Indian geoscientists. He added that the steps should be creating Centre of Excellence as a National facility followed by capacity building (training young groups) and finally embark on India-centric major research projects. He added that for funding major projects, DST could be approached. Dr. M. Baba (CESS) also supported the proposal to set up Centres of Excellence.

3.6. Prof. Pulak Sengupta (Jadavpur University) and Prof. Abdul Matin (Calcutta University) pointed out that universities lack funds and expertise to set up such a National Centre of

Excellence. They advocated that specialized laboratory facilities of various institutions should be made available to universities for furtherance of research. In this respect, Prof. Pulak Sengupta (Jadabpur University) praised the quality of data generation in the EPMA Lab of CGL, GSI, Kolkata. Dr. M. Baba (CESS) and Dr. Y.J. Bhaskar Rao (NGRI) said that as GSI, being the largest Geoscience Organisation in the country, should take the lead to set up such Centres of Excellence. However, they added that such centre/s should be given some autonomy in functioning in line with the best Laboratories of the world and the traditional mode of administration followed in GSI would not be suitable.

3.7. Dr. M. Baba (CESS) said that GSI and this Subcommittee should take the lead role in setting up an "Earth Science Commission" (similar to Space Commission) for betterment of Earth Science Research In India. The Convener held it as a revolutionary idea. Dr. Baba added that the constitution of a separate Subcommittee on Fundamental and Multidisciplinary Geoscience by MoM is in itself a revolutionary idea.

3.8. Dr. M. Baba (CESS) said that climate change related to India and modelling future trends should be given priority. He added that all apprehensions about future climate change are mainly based on data generated from other parts of the globe and we need to generate our own data base. According to him, other domains that should be prioritized are: (i) Carbon credit and carbon sequestration, (ii) Sustainable mining methods to reduce wastage, (ii) Mineral beneficiation, (iii) Hydrology, (iv) Construction materials and (v) research inputs to facilitate agriculture. He added that the National Geochemical Mapping Programme, undertaken by GSI would prove helpful for agricultural purposes also.

3.9. Shri Aswin Rao (ACC) stressed on Environmental Management Studies. He also wanted GSI to take up Slope-Stability Studies in mines / hilly areas. He added that funding for such projects might be available from Private agencies.

3.10. The convener drew attention to the booklet circulated in which research activities of GSI in various fields are summarized. He added that GSI has already taken up several projects on Environmental Geology (including Medical Geology) and Natural Hazards. He mentioned case studies on (i) Arsenic pollution of groundwater and its mitigation and (ii) studies on fluorine and selenium toxicity etc. GSI has been nominated as the nodal agency for Landslide Hazard Studies and is monitoring incidences of landslides throughout the country. . In addition, GSI has already taken up seismic microzonation studies on several important cities of India.

3.11. Shri Arun Kalra (De Beers) opined that basic geology, high definition geophysical studies, precise geochronology, studies in mantle dynamics and architecture should be given priority.

4.0. Agenda Items: Development of Standard Reference Materials/ Need to change University Curriculum / Dissemination of knowledge: Setting up of Geological Monuments and Parks.

4.1. The Convener informed the gathering that GSI is actively engaged in the preparation of Standard Reference Materials (SRM) and as already detailed by Dy. Director General (Geochemistry) and Director, PPOD Division, AMSE Wing, GSI, several rock and soil SRM standards have already been prepared. He requested help from all other laboratories, as and when needed, to analyze samples meant for preparation of SRM (Action: All Institutions with facilities for precise Chemical Analysis).

4.2. Dr. Y.J. Bhaskar Rao (NGRI) suggested that standards for natural gems and various minerals are also to be prepared. He pointed out that there is still no international standard for zircon older than 1900 Ma (Action: All institutions having EPMA facility).

4.3. Initiating discussion on Geology Curriculum in Indian Universities, the Convener said that uniformity in curriculum in Geology at the Graduate and Post-Graduate level in Indian universities is desirable but it may be difficult to achieve. Dr. Y.J. Bhaskar rao (NGRI) also opined that uniformity of syllabus is desirable. However, he felt that such issues should be discussed at UGC level.

4.4. The issue has been discussed by various participants. Dr. R.S. Mishra (KDMIPE, ONGC) opined that there is a necessity to teach some specialized topics at the Post-Graduate Level so that the students acquire necessary expertise to meet present-day needs of the industry. Dr. Pulak Sengupta (Jadavpur University) commented that teaching should be process-oriented rather than product-oriented. Dr. Y.J. Bhaskar Rao (NGRI) added that Post-Graduate students may be allowed to work in different organizations for getting exposure in specialized fields. The Convener said that as introduction of specialized disciplines in Post-Graduate Courses may take some time to fructify, employers should train their manpower according to their needs.

4.5. The Convener drew attention of the meeting to the role of National Monuments and Museums in spreading awareness amongst people. He briefed the audience about GSI's role in creating several important Geological Monuments in the country. He requested industries to come up in maintaining Geological Monuments. Shri G.K. Pancholi and Dr. D.M. Mahobe, Directors, GSI, said that the Tourism Department and the State Government might be approached for maintenance of Geological Monuments. Shri B. Chakrabarty, Director, Curatorial Wing, GSI, announced that the High Powered Committee set for GSI has suggested erection of Geological Museums in major cities of the country. He requested all the institutions for generous contribution of samples.

5.0. Concluding Session:

5.1. The proceedings of the meeting was briefly summarized by the Convener. The Convener assured the house that all the suggestions received will be given due importance. Dr. M. Baba (CESS) suggested that the Agenda for the Second Meeting should be based on the recommendations of the First Meeting.

5.2. Dr. Joy Gopal Ghosh, Geologist (Sr.) GSI, pointed out that GSI is facing a serious manpower crunch to implement all the envisaged programmes. With the induction of additional manpower, the problem is likely to be lessened considerably. He advocated for some financial autonomy to run sophisticated instrumental set ups.

5.3. Prof. Abdul Matin (Calcutta University), Dr. Joy Gopal Ghosh, GSI and Shri Aswin Kumar (ACC Ltd) desired that the proceedings and minutes of the meeting should be available in GSI portal. The Convener assured that the minutes of the meeting would be circulated to all participating institutes and put up in the GSI portal.

5.4. Dr. M. Baba (CESS) expressing satisfaction on the discussions that took place in the meeting, opined that though this committee does not have autonomy, but it should provide a forum for expressing free and frank opinion.

The meeting ended with Vote of Thanks proposed by Shri Goutam Sarkar, Member Secretary of the Subcommittee.

RECOMMENDATIONS/DECISIONS

1. All participants stressed the need to have collaborative research in the field of Fundamental and Multidisciplinary Geoscience. The participating institutions can formulate programmes and seek collaboration from Member Institutions.
2. The need to set up a National Centre of Excellence equipped with state-of-the-art instrumental facilities is stressed in the meeting and GSI, being the largest Geoscientific Organization should take the lead in this aspect.
3. Research Centre set up as National facility should be given adequate financial power to run the show. All the participants agreed that some amount of autonomy should be provided to such a centre.
4. Capacity building should be given highest priority. Personnel with appropriate background and aptitude should be selected and trained in reputed Indian Laboratories and also abroad to work in different sophisticated research laboratories and proposed Centre of Excellence.
5. In addition to SRM for rock /soil samples, attempts should be made to prepare mineral and gem standards.
6. Major domains of research to be prioritized:
 - Studies in Environmental Geology and Climate Change during Quaternary.
 - Studies in Paleobotany, Palynology, Micropalaeontology, Palaeoecology and Evolution of Early Life.
 - Seismotectonics and Natural Hazard Mitigation Studies.
 - Fundamental research in the field of Crustal Evolution, Crust/Mantle interaction processes, Dynamics of the mantle and lithosphere through geological and geophysical studies.
 - Structure and dynamics of major Sedimentary Basins.
 - Natural Resource Management Studies (Metallogeny, Researches in sustainable utilization of mineral and fossil fuel resources, mineral beneficiation etc).
 - Geological CO₂ Sequestration Studies.
 - Researches in Hydrology / Marine Geology and lithosphere-atmosphere interface.
 - Waste Management studies in mining districts.

1st Meeting of CGPB Committee X : Fundamental and Multidisciplinary Geoscience

Annexure-I

LIST OF MEMBERS AND INVITEES WHO WERE REQUESTED TO ATTEND THE FIRST MEETING OF THE COMMITTEE X OF CGPB HELD ON 22.7.2009 IN KOLKATA

Members:

1. Director (Technical), Ministry of Mines*
2. Representative from Department of Science and Technology, Govt. of India*
3. Oil and Natural Gas Commission, Dehradun
4. National Geophysical Research Institute, Hyderabad
5. Wadia Institute of Himalayan Geology, Dehradun*
6. DGM, Govt. of Jharkhand*
7. Rio Tinto*
8. De Beers
9. Sr.Dy.DG / Dy. DG of GSI connected with the programmes on Fundamental Geoscience, Dy. DG, GSITI, Director (Monitoring) & Director (CGPB), Central Headquarters, GSI.

Permanent Invitees:

1. Representative of CSIR*
2. Indian Meteorological Department, Delhi*
3. Representative from Geology Department, Punjab University*
4. Representative from Geology Department, Calcutta University
5. Representative from Geology Department, Anna University*
6. Representative from Geology Department, Jadavpur University
7. Representative from Geology Department, Delhi University*
8. Representative from Geology Department, M.S. Baroda University*
9. Representative from Geology Department, Mysore University*
10. Representative from Geology Department, Osmania University*
11. Representative from Geology Department, IIT, Kharagpur*
12. Representative from Geology Department, IIT, Roorkee*
13. Representative from Geology Department, IIT, Mumbai*
14. Centre for Earth Science Studies, Thiruvananthapuram
15. Defence Metallurgical Research Laboratory (DMRL), Hyderabad
16. NCEMP, Allahabad*
17. Birbal Sahni Institute of Palaeobotany, Lucknow
18. ACC Ltd.

* Members / Invitees who could not attend the meeting.

1st Meeting of CGPB Committee X : Fundamental and Multidisciplinary Geoscience

Annexure-II

LIST OF MEMBERS AND INVITEES WHO ATTENDED THE FIRST MEETING OF THE COMMITTEE X OF CGPB HELD ON 22.7.2009 in KOLKATA

Convener: Shri Amitabha Sarkar, Dy. Director General, CGL, GSI, Kolkata

Member Secretary: Shri Goutam Sarkar, Director, CT, CGL, Kolkata

Members:

1. Shri Neetish Kr. Dutta, DG (C.C.), GSI, Kolkata
2. Shri Jaswant Singh, Sr. DDG, STSS, GSI, Kolkata
3. Dr. B. Chattopadhyaya, DDG (PPM), CHQ, GSI, Kolkata & Member Secretary, CGPB
4. Shri S. Dasgupta, Director, P & M, GSI, CHQ, Kolkata
5. Dr. U. Prasad, General Manager, KDMIPE, ONGC, Dehradun
6. Dr. R.S. Mishra, Suptdg. Geologist, KDMIPE, ONGC, Dehradun
7. Dr. Y.J. Bhaskar Rao, NGRI, Hyderabad
8. Shri Arun Kalra, Head- Business Development, De Beers
9. Shri M.M. Swamy, DDG (ER), GSI, Kolkata
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