NEWS AND VIEWS AT A GLANCE

FORTHCOMING EVENTS:

American Geophysical Union Conferences:

a. 27-31 July - Chapman Conference: The Width of the Tropics: Climate Variations and their Impacts (Santa Fe, New Mexico)

b. 27 Sept-2 Oct. - Chapman Conference: Magnetospheric Dynamics (Fairbanks, Alaska)

c. 14-18 Dec- AGU Fall Meeting

AWARDS AND RECOGNITIONS

1. Mr. Netramani Sagar Junior Scientist, CSIR-NGRI, has been elected in 2015, as Associate Fellow, AP Akademi of Siences,India.He was selected 2014/2015 IODP Expedition 353 Science Party Member: Indian Monsoon Rainfall

2. Raman Research Fellowships (RRF) for the year 2014-2015, include:
   Dr M Ram Mohan, Pr. Scientist CSIR-NGRI, 3 months(Dr Michael Wiedenbeck, SIMS Laboratory, Potsdam, Germany)
   Dr Maheswar Ojha, Scientist CSIR-NGRI, 3 months (Prof Mrinal K Sen ,The University of Texas, Austin,USA)

3. CSIR Young Scientist Awards 2014
   Earth, Atmosphere, Ocean & Planetary Sciences: Dr Sumit Kumar Mishra, Radio and Atmospheric Sciences Division, CSIR-NPL, New Delhi.

SCIENCE NEWS

Pollution and ongoing initiatives

Presently, both the government's and responsible citizens attention is aimed at meeting the needs of the society, while ensuring improved handling of environmental problems. The government is trying to tackle the pollution problem in a big way using indigenous and borrowed technologies from countries like Germany, USA, Australia and Japan. The initiatives look good on paper, as usual. Problems surface one after the other while executing various works. It is necessary for all those who are involved in the "Swachh Bharath" not to aim at targets that cannot be reached within a limited time slot, as execution mechanism gets hampered, with time restriction acting as a big impediment, leading to diversion of priorities and introduction of new hurdles. At the same time, it is highly non productive if targets are fixed randomly, leading to generation of half cooked food (neither one can eat nor throw). One should be bold enough in admitting that it is not viable to eradicate pollution with in a fixed time target, as pollution and environmental degradation have not set in overnight and removing pollution needs a revolutionary change in our day to day activities and mammoth involvement of all the stake holders. In a democratic set up, it is usually inevitable (many a time) that targets are fixed to attract the attention of common man .Pollution is increasing unabated. To arrest pollution of different hues and colours, one has to take up bold steps. Ganga River cleaning process is a bold initiative. Its success depends on a judicious mixing of technical initiatives and socio-economic obligations. Since our government has taken the initiative, as earth system scientists (who are directly linked to societal problems) we need to chip in. Even though on paper it looks like a good initiative, we have to be prepared to face setbacks, as many components of varied dimensions are to be properly linked within a fixed time slot. Whatever we choose, as a work element, need to be executed properly without sacrificing quality. It is my belief that learned young brigade can initiate steps that could help the society, once draw backs in various theories and execution mechanisms are brought to their notice in a manner that can have long lasting impact. It is essential to pool up our energies,

making use of our gained knowledge, and support government`s initiative. To properly assess the ground reality, we need to generate models that are both realistic and viable to execute. Since our view point may not be given due importance by the concerned in planning and execution sectors of the government, it is essential for us to talk in their language to drive in our point. For this we have to go through the media presentations and select relevant approaches. To make things easier for the learned young scientists some media briefings are listed below. Details given below are random in nature but do convey the basic truth. Interested can enhance their knowledge base by going through specifics, reading articles and interacting with knowledgeable. Once satisfied they should come forward and specifically show how and why a particular cleaning component should be altered or executed differently. If the learned young keep quiet the R.65,000/crores (tentatively earmarked to execute the project) may not provide needed results, making future initiatives stalled for ever.

Basic Strategy in implementing Ganga River cleaning Project:

Over the past four to five years, when experts from seven IITs have brainstormed over several meetings on how to rejuvenate the river Ganga, they stumbled upon two words in the Hindi lexicon — aviral and nirmal. None of the professors from IIT Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Chennai and Roorkee is a Hindi scholar, but they knew aviral (uninterrupted) and nirmal (clean) would form the crux of their comprehensive study on the Ganga basin, mandated by the Union ministry of environment and forests in July 2010. They have pointed out in their report submitted to Gov of India that cost of the project might reach a whopping Rs 1 lakh crore to make the Ganga aviral and nirmal. That comprehensive plan includes cleaning the Ganga's tributaries, city management, tourism development and creating a navigation channel from Allahabad to Haldia in West Bengal. It's a plan that calls for, along with huge resources, a large-scale vision. That's a huge number that gets further magnified when you consider that only Rs 1,825 crore was spent in cleaning the Ganga between 1985 and 2009 in phases of the Ganga Action Plan, or GAP as it's popularly called.

Quiet Flows the Ganga

Uma Bharti, Union minister for water resources, river development and Ganga rejuvenation, is confident of an aviral funding for the project. Her ministry, and not the ministry of environment and forests as in the previous government, will implement the Ganga plans. "There won't be any shortage of funds for the Ganga rejuvenation programme", she said while addressing a deliberation titled "Ganga Manthan" in New Delhi in early July, 2014."The plan was appropriately named. There were so many gaps in the scheme... what's needed now is a comprehensive approach." Bharti's palpable confidence stems from the solid political backing she has of the Prime Minister, Narendra Modi. When Modi decided to retain Varanasi , he evoked sentiments attached to the river. "I will represent Varanasi in the Lok Sabha and I look forward to this wonderful opportunity to serve Ganga Maa and work for Varanasi's development," Modi tweeted on May 29,2014 three days after he was sworn in as Prime Minister of India.

The first real indication that Modi sarkar attaches huge importance to mission Ganga is an allocation of Rs 2,037 crore for 2014-2015 alone to kick start an integrated Ganga conservation mission, apart from a separate funding of 100 crore for ghat development and beautification in Kedarnath, Haridwar, Kanpur, Varanasi, Allahabad, Patna and Delhi. In addition, Rs 4,200 crore is slated to be spent over a span of six years for developing a navigation corridor from Allahabad to Haldia.

Fringe Benefits

OP Agarwal, a former bureaucrat who had a stint in World Bank's Washington, DC headquarters as a global transport specialist, says the success of the proposed navigation channel will depend on a variety of factors including right investments in

terminal infrastructure and high quality vessels. He reckons navigation could extend beyond the Ganga to other rivers as well. "The use of this mode should be encouraged in other areas such as Assam [Brahmaputra], Odisha [Mahanadi] and Kerala [the backwaters]," Agarwal adds. And once the river turns clean and perennial, it could open up a new vista for Ganga tourism. Many other suggestions were made by both the experts and political big wigs. But all these could at best be called grand ideas, the rolling out of which will depend solely on the government's ability to first turn Ganga into a clean and uninterrupted river. David Graham of UK's Newcastle University, who had done extensive studies on river Ganga, charts out the priorities for Modi sarkar. "Solutions include routing wastes elsewhere, improving waste treatment prior to release, and motivating 'social engineering' to change behaviours and attitudes related to water quality in the river," Graham says. Already, the government has been contemplating a massive drive to discourage people from open defecation along the river. But Graham is not fully convinced of its long-term utility. "Delaying waste inputs, by providing portable toilets at habited locations, is an easy and immediate solution, but this does not completely solve the problem," he adds.

Magnitude of the operation

A scan through available data exposes one to the magnitude of the operation....River coverage is 2525 sq.km; Basin size is over one million sq.km; Drainage is 861,404 sq.km; states it touches Uttarkhand, U.P, H.P, Rajasthan, Haryana, Chattisgarh, Jarkhand, Bihar, W.Bengal, Delhi and M.P. (Source:http://articles.economictimes.indiatimes.com/2014-07-27/news/52089009_1_ganga-action-plan-ganga-sagar-ganga-maa).

Present Status of the Project—Initiatives and co-operation from international channels

Even though not comprehensive, for want of space, the following excerpts bring in to focus the present state of the project. Details need to be supplemented by continuous in flow of information, to specifically address any component of the project.

**India and Germany discussed various challenges and solutions related to water and waste management, resource efficiency and sustainable urban development. Environment Minister Prakash Javadekar and his German counterpart Barbara Hendricks addressed the Indo-German Environment Forum in New Delhi on issues related to water and waste management.

Addressing the meet, Hendricks praised New Delhi's efforts to clean river Ganga. "Water is an elementary resource for our lives. Water is vital for our people and the environment. Responsible water use is a task for each and every one of us. The state had a task for ensuring to clean water for all people and facilitate sustainable use," said Hendricks. She also spoke about the high-level of pollution in West German rivers. Hendricks said that West Germany was facing water-related challenges due to dynamic economic development, which led to massive pollution of water bodies. The river line was so polluted in 1960 that there were no longer fish in it, she added.

Javadekar told the gathering that the new government is aimed at achieving energy efficiency and water use efficiency by 2020. "Management conservation, optimum utilization of water is one of the biggest challenges being faced by the mankind. National water mission aims at conservation of water, minimizing wastage and ensuring more equitable distribution mainly through increasing water use efficiency at least by 20 percent," said Javadekar.

Speaking about waste management, Hendricks added that Germany has 40 years of experience in building modern waste management systems."The question of how to deal with our waste can be answered only when the ground reality is understod. A well functioning waste management system protects the environment and human health, saves resources and is climate friendly and socially satiable," said Hendricks.

Germany and India have been long-standing environmental cooperation partners. The first Indo-German Environment Forum was held in 2008 in New Delhi.

SOURCE: http://www.business-standard.com/article/news-ani/india-germany-discuss-water-waste-management-challenges-115012800899_1.html

Editor's Note: It is normal to be positive during such visits by high level diplomats. Both the leaders know the ground reality. River dynamics does not allow short term purification measures to eliminate pollution. One has to first identify the source of pollution and plug it. However, when there are multiple sources stretching over hundreds of km it is beyond anyone's capacity to eradicate the pollution, unless every stake holder co-operates; an impossible task as many gain from such pollution resultant operations and they would never leave their activities .However, modern waste management systems being projected as very apt can be tried keeping in view area specific problems and societal obligations. To start with common man needs to be educated and trained to understand the negative impact due to waste material and then involve him in executing various management programs, in his/ her area. Such an approach alone can make technological initiatives successful.

**Australian high commissioner to India Patrick Suckling recently devoted considerable time for the Ganga during his visit to the city to understand the miseries of the holy river and explore possible solution of the existing problems. To discuss various issues related to the Ganga and its pollution he met experts of National Ganga River Basin Authority (NGRBA).During discussion the Australian High Commissioner tried to understand whether and to what extent the model of Australia's Murray-Darling Basin Plan could be implemented for the Ganga in India. It may be mentioned here that the Murray-Darling Basin Plan entails cutting existing water allocations and increasing environmental flows. It limits water use at environmentally sustainable levels by determining long-term average Sustainable Diversion Limits for both surface water and groundwater resources. The basin plan includes components like an environmental watering plan to optimise environmental outcomes for the Basin, a water quality and salinity management plan, requirements that state water resource plans will need to comply with, if they are to be accredited, a mechanism to manage critical human water needs, and requirements for monitoring and evaluating the effectiveness of the implementation of the Basin Plan.

Suckling mainly tried to explore the ways how to support Ganga cleaning and water management. He said that Australia intends to collaborate in Ganga water management for the benefit of people and agriculture based on a well-defined plan. Suckling also visited the Swachha Ganga Laboratory of SMF. The Australian envoy said that water experts would be sent to Varanasi for further detailed and subjective discussion on the issue of Ganga, he added.

Indian Prime Minister Narendra Modi and Australian Prime Minister Tony Abbott in November last had made a joint statement for collaboration on rejuvenating the Ganga River. They welcomed two-way exchanges and cooperation in river basin planning under the water partnership and a new programme of joint research on agricultural water management.

SOURCE : http://timesofindia.indiatimes.com/City/Varanasi/Murray-Darling-basin-model-to-be-cornerstone-of-Ganga-rejuvenation/articleshow/46502212.cms

Editor's Note: It is a good proposal. However, the two environs are different in nature and the problems to be tackled need a different approach. It is essential to make proper use of socio-economic reality that exists all along Ganga river and its banks, while developing execution strategies built around technical knowledge gained in Australia. It is essential to have a detailed Road Map that shows polluting channels and the probable problems that may surface in plugging those polluting channels,

while not giving a scope for pollution to migrate to healthier environment.

**Union minister of state Javadekar stated that the Centre will strive to implement the developmental projects in the country without damaging the environment. Sharing the government's plan for balanced growth at an interactive session on 'Balancing Environment with Development' , he said on one hand we will take forward the agenda of development and on the other, we have taken the pledge of protection of the environment. Javadekar dispelled the notion that development and environment are two opposites and expressed his government's commitment to undertake development while protecting the environment.

"With a clear vision, use of technology and involvement of the people, we will bring about positive development in the country," Javadekar said. By 2025, the government will implement the River Improvement project, wherein all the rivers will be cleaned and improved, he said. This project will start with the Ganga River Improvement project, Javadekar said and expressed confidence that by 2025, energy efficiency would be increased by 20 to 25 per cent.

SOURCE : http://economictimes.indiatimes.com/news/environment/developmental-issues/development-of-country-while-protecting-environment-possible-javadekar/articleshow/46690801.cms?prtpage=1

Editor's Note: Let us hope at least 20% improvement is achieved, as that needs considerable commitment and sacrifice by all the stakeholders. Once this barrier is broken it is easier to go forward. That is Simple Reality.

**Ministry of Water Resources, River Development and Ganga Rejuvenation is supplementing the efforts of the States for pollution abatement of river Yamuna, a tributary of River Ganga, by providing financial assistance to Haryana, Delhi and Uttar Pradesh in a phased manner since 1993 under the Yamuna Action Plan (YAP). Under YAP-I and YAP-II, an expenditure of Rs. 1514.70 crore has been incurred for creation of new sewage treatment capacity of 942.25 million litres per day (mld) in the States of Delhi, Haryana and Uttar Pradesh. In addition, a sum of Rs. 1656 crore has been approved for Delhi under YAP-III for rehabilitation and up gradation of existing Sewage Treatment Plants (STPs) (950 mld) and trunk sewers. This has been further supplemented by Jawaharlal Nehru National Urban Renewal Mission (JNNURM) for Rs. 1357 crore for an interceptor sewer project to intercept and treat untreated sewage flowing into river Yamuna from three major drains namely Najafgarh, Supplementary and Shahdara. Besides these, two projects have been sanctioned in Sonepat and Panipat towns at a cost of Rs. 217.87 crore for pollution abatement of river Yamuna. The main project components include construction of new STPs of 70 mld capacity and rehabilitation of existing STPs of 75 mld capacity. The works are being implemented by Public Health Engineering Department (PHED), Haryana. This information was given by Union Minister of State for Water Resources, River Development and Ganga Rejuvenation Prof. Sanwar Lal Jat in a written reply in Rajya Sabha on 12th May.

SOURCE: http://www.business-standard.com/article/government-press-release/efforts-for-pollution-abatement-of-river-yamuna-115051100544_1.html

Editor's Note: It is good to take initiatives to clean different rivers. But, we need to have a viable mechanism that can ensure the cleaning process is not reversed due to fresh pollution. As such it is essential to take punitive measures that discourage individuals and industries from polluting Rivers. Unfortunately, in our democratic system, vote bank policies force us to dilute good norms, making good initiatives end as failed measures. This aspect needs to be given top priority both by the government and judiciary.

****Environment minister said the government is in the process of making necessary changes in rules and regulations to control pollution. "As many as 64 government officers gave us suggestions about proper implementation of various policies

regarding pollution control. We are making necessary changes in rules and regulations to control pollution," Javadekar told reporters after launching the "Swachh Bharat: campaign. "We have detected 17 highly polluted locations and initially 3,000 industries have been selected for installation of pollution control devices for proper effluent discharge," he said. "The same exercise will be followed for all industries in the country," he added. Stressing that no damage to the environment will be allowed, and proper action will be taken against those causing pollution. He also said that satellite images of rivers will be used to locate points for sand extraction and assured that no damage to the rivers will be allowed. On the action being taken against use of plastic bags, he said plastic bags measuring 40 microns and below in width are totally banned and added that the pollution control department has been instructed to immediately seize the stock of such bags found anywhere. Clean air, clean water, clean power, and green surroundings are the four major tasks determined by the environment ministry, he said while seeking people's participation to achieve the target**.**

SOURCE : http://www.livemint.com/Politics/lpWlFep6i46SKvG9m2IN4J/Govt-to-make-changes-in-rules-to-control-pollution-Prakash.html

Editor's Note: In the last 60 years, Rules and regulations have been framed and reframed to curb pollution. Unfortunately, the offenders always find loopholes, in collusion with corrupt officials and powerful political lobbies. Slogans and legislations should be replaced by actions. It is time all the stakeholders support legislations aimed at saving our environment. If not, nature will take its own course that might affect one and all radically. In this context the statement made by NGT Chairperson Justice (retd.) Swatanter Kumar assumes importance. He said that times have come when we have to balance between sustainable development and protection of nature and environment. "Development is essential, who can dispute that fact? You need industries, you need aeroplanes, you need energy... Only thing is that how would you do it? "We need to take some harsh decisions so that the people today and the next generations do not suffer," he said. Addressing the gathering, Justice (retd.) Kumar said," The earth, the nature, like a mother forgives you for all that you do. It tolerates every harsh thing, human beings are inflicting on it..." But there is limit to this tolerance. When it gets beyond the tolerance, then the mother earth and the nature revolt. And when it revolts, disasters are what you are seeing in Uttarakhand, Nepal, and other places."

**The Union Cabinet on 14th May approved a massive Rs 20,000 crore budget for Prime Minister Narendra Modi's pet 'Namami Gange Programme' for the next five years, which is a five-fold increase over the money spent in the last three decades towards the conservation of the river.

In order to push the efforts for the Ganga's clean-up, the statement said that the Centre will now take over 100 per cent funding of various activities/ projects under this programme. Marking a major shift in implementation, the government is focusing on involving people living on the banks of the river to attain sustainable results.

The statement said that, drawing from past lessons, the programme also focuses on involving the states and grassroots- level institutions such as Urban Local Bodies and Panchayati Raj Institutions for its implementation. The programme would be implemented by the National Mission for Clean Ganga (NMCG), and its state counterpart organisations, that is, the State Programme Management Groups (SPMGs).

NMCG will also establish field offices wherever necessary, the statement added.In order to improve implementation, a three-tier mechanism has been proposed for monitoring projects, comprising a high- level task force chaired by the Cabinet Secretary and assisted by NMCG at the national level, state-level committees chaired by Chief Secretary and assisted by SPMG and district-level committees chaired by the District Magistrate.

In view of the unsatisfactory results of the earlier Ganga Action Plans, the Centre now plans to provide for operation and maintenance of the assets for at least a 10-year period and adopt a PPP/SPV approach for pollution hotspots, the statement said.In an attempt to bolster enforcement, the Centre also plans to establish a four battalion-strong Ganga Eco-Task Force, a Territorial Army unit. It is also contemplating legislation for checking pollution and protecting the river, the statement added. Namami Gange Programme stresses on improved coordination mechanisms between the various Ministries/ Agencies of the central and state governments. Major infrastructure investments, which fall under the original mandate of other ministries, like Urban Development, Drinking Water and Sanitation, Environment Forests and Climate Change (EF&CC), will also additionally be undertaken.

Namami Gange will focus on pollution abatement interventions, namely interception and diversion and treatment of waste water flowing through open drains via bio- remediation/ appropriate in-situ treatment/ use of innovative technologies/ sewage treatment plants (STPs)/ effluent treatment plant (ETPs). It also aims at rehabilitation and augmentation of existing STPs and immediate short-term measures for arresting pollution at exit points on river front to prevent inflow of sewage, the statement added.

Significantly, the approach is underpinned by socio- economic benefits that the programme is expected to deliver in terms of job creation, improved livelihoods and health benefits to the vast population that is dependent on the river, the statement said.

SOURCE : http://economictimes.indiatimes.com/news/economy/infrastructure/pm-modis-namami-gange-programme-cabinet-approves-a-massive-rs-20000-crore-budget/articleshow/47264837.cms?prtpage=1

Editor's Note: The implementation strategies adopted look good. It is essential for the success of this important project every component mentioned above is provided support from one and all. It is also good to learn a 10 year time slot is selected , instead of cramming things in a limited period, leading to probable haphazard implementation and maintenance of the project**.**

****** The government has proposed a law penalising pollution of the Ganga. Out of four drafts received by the Ministry of Water Resources, one is based on suggestions made by the IIT consortium. The Ministry of Water Resources, Environment and Forests, Law and Urban Development are the key ministries involved in drafting the law. Already based on Green Tribunal, the government has issued notices to all 118 Urban Local Bodies and 687 grossly polluting industries to come with Action Plans on setting up sewage infrastructure and sewage treatment plants. A conference will be soon convened with District Magistrates to give a push to the programme. According to official sources, about 501 million litres per day (MLD) of untreated waste is discharged from industries and 4000 MLD from Municipalities. The National Mission for Clean Ganga is focused on abatement of pollution and has designed its interventions around this. However, it is seeking partnerships and is tailoring its projects so that state governments, local municipalities and panchayats have a stake and take ownership of the projects for sustainability. To speed up the process of cleaning the river and its 41 tributaries, the Mission has sought the participation of institutions, donors, overseas Indians, business and corporate houses to donate their might and money for projects or sponsoring projects to clean up the river. Already pilot plants have been launched in 8 cities. The challenge is to set up a drainage system in thickly populated cities. The urgent need is to bring down lean season BOD levels in the river to 10 mg/ litre/ day, the Total Suspended Solid levels to 10 mg/ litre/ day and Total Faecal Coliform to 100 mg/ litre/ day. These levels run into over lakhs at present(**Source**: The Hindu, 19th May).

Editor's Note: This is a positive development. Every stakeholder should support this initiative, to make the project successful. For Waste treatment we can seek the help of German experts.

LIVING LEGENDS-KNOW YOUR PEERS

DR.P.V.SANKER NARAYAN.

Prof.Sanker Narayan was born in 1923. After bachelors degree from Madras University in 1943, Prof. Sanker Narayan achieved significant laurels. He served in the India Meteorological Department at Bombay, Poona and the Astrophysical Observatory, Kodaikanal till 1956 when he left for USA for higher studies. After taking MS degree in Atomic and Nuclear Physics in 1958 and PhD in Space and Planetary Physics in 1961 (both from the University of Wisconsin, Madison, Wisc., USA) he taught as an Assistant Professor on the Geophysics faculty of the same university for a brief while & returned to India in 1962.

On his return in 1962, he joined National Geophysical Research Institute (NGRI) of the Council of Industrial and Scientific Research (CSIR) in Hyderabad. During the next 2 decades he developed at NGRI a complete division on Geomagnetism and Geoelectricity establishing it as a data gathering center, a geomagnetic and geo-electric observatory at a location near Hyderabad and also at Ettayapuram (TN), this latter station having special significance to space magnetism as being the only one in the world located at the earth's magnetic equator.

Parallely with the research and development activity he also developed a Multi-parameter Airborne Geophysical surveying system to serve as a national facility for new airborne exploration task desired by the Government departments like the Atomic Minerals Division of Atomic Energy Commission, National Remote Sensing Agency (NRSA), Geological Survey of India, Geological and Mining departments of states. For his contributions to the development of airborne geophysics he was awarded the Decennial Award of the Indian Geophysical Union in 1980.

On his retirement from CSIR in 1983 he settled down in his home town, Chennai where he started investigating the possible interaction of extremely low frequency ultra low intensity magnetic fields with the living organism (both animal and plant kingdom). Under support from DST a series of experiments were organized during 1981-1984 at the Voluntary Health Services Medical complex at Adyar studying the effects of Pulsed Magnetic Fields (PMF) of extremely low frequency and ultra low intensity on test animals and human volunteers. The first results showed great promise for PMF as a very effective non-invasive therapy agent.

In the wake of these milestone experimental results the Madras Institute of Magnetobiology was formed in 1984 with Sanker Narayan as one of the founder Directors. It was registered as a scientific society under the Tamil Nadu Societies Registration Act, 1975.

For his contribution to the new hybrid discipline of Magnetobiology he was awarded the M.K.Nambiar Memorial Oration of the Indian Association of Biomedical Scientists in 1983. Founder Director, Madras Institute of Magnetobiology.

Vummidi Bangaru Jewellers Award in 1992 for contributions to the discipline of Magnetobiology and Biomagnetism.

Books - 2,

Research papers, reports - 184,

General articles - 20

A.G.BHASKARA REDDI –
A FIRST PERSON ACCOUNT

Personal Information: Born: Nov. 21, 1932, Place: Anantapur, Andhra Pradesh. Qualification: M.Sc. (Applied Geophysics). Employment: Joined GSI as Asst. Geophysicist Oct. 10, 1955. Retired on superannuation Nov 30, 1990. Last designation: Dy. Director General

Overseas visits: BAGDAD as part of a delegation offering ground water expertise; SYDNEY and WASHINGTON as a participant in the two IGCs held at these places; CANADA to study exploration strategies for potash and its mining across the country; TORONTO (Canada): Three successive trips for purposes of testing and acquiring a multisensor airborne system for GSI ; AUSTRALIA as part of a multidisciplinary delegation from India for exploring areas of scientific collaboration with that country.

Awards:

National Mineral Award; Indian Geophysical Union (Decennial); LN. Kailasam Memorial Lecture (under the IGU)

Book publications (GSI):

Bouguer Gravity Atlas of the Western Indian Shield

An Album of Geophysical Responses over base metal ore bodies in Rajasthan and Gujarat

A Compendium of four decades of geophysical activity in GSI

Papers published (Journals):

On Gravity work in Cuddapah basin

On Deep Resistivity soundings over the Deccan basalts

On the role of Shallow hole temperature surveys in exploration

On Interpretation of aeromagnetic data between 8°N and 12°N latitudes (Southern India)

On the Role of gravity and heat flow studies in the context of Intraplate seismicity in India

Those good Times: The bell tolled for my eventual exit from GSI on the last day of November 1990. There has been ever since a geophysical vacuum in my life, a vacuum largely by choice and yet not a vacuum altogether, filled as it has been with other concerns. As a result of this exile for two decades and a half, I have been obliged to draw upon a somewhat fuzzy memory of whatever was done (or not done!) during my long tenure.

In retrospect, I may lay claim to have been one of those favored by destiny in more ways than one. First of all I was blessed with a lineage of remarkably indulgent bosses! Far more importantly I was gifted with precious colleagues who always gave me all of themselves unstintingly and at all times. They were the actual source of my strength and inspiration that fuelled my inner and outer growth. They were exciting times for geophysics as well with its ballooning capabilities in acquiring, processing and translating multiple data sets into meaningful geology. All in all it was a rapidly evolving scenario engulfing an entire generation. We were on the move, despite ourselves!

A miscellany: My first independent foray was into identification of freshwater pockets in Delhi alluvium. Another investigation in a sedimentary basin was a fruitful search for new lignite resources in the tertiary rocks of Neyveli and environs primarily by gravity surveys. Exploration in Byrapur area of Karnataka was negatively useful ruling out the possibility of new chromite bodies in the neighborhood of the working mine. Surveys for manganese ore near Nagpur were hugely successful. Complementing base metal investigations in Agnigundala of Andhra Pradesh, a few regional gravity profiles were run across the Cuddapah basin not only leading to the estimation of the thickness of the Palnads in the north but also to the location of some interesting

gravity highs that have since been reinterpreted by later workers as signifying the presence of older schistose rocks. This would evidently imply the possibility in these areas of mineral potential below the Cuddapah formations. I was associated with certain other investigations in Maharashtra, Madhya Pradesh, Rajasthan and Gujarat but they are not cited here as my involvement in them was largely supervisory.

My major contributions relate primarily to the Deccan trap, the Western Indian shield and Airborne surveys which have been therefore highlighted below :

The Deccan: The Traps had always lured me for their secrets and we got a chance to go after them with the opening of the Central Region Office of GSI in Nagpur. Chronic droughts in this part of the country impelled initiation of extensive resistivity surveys both over trap proper and the peripheral older sediments. Water bearing vesicular flows were effectively targeted within the volcanic pile for the first time that has since revolutionized groundwater exploitation in the region. Our sights were side by side set on mapping the floor of the traps both for its economic and fundamental scientific implications. For this special purpose a new dc resistivity device with higher power supply capabilities was deployed. The method turned out to be astoundingly successful for mapping subtrappean geology in general and unveiling sediments with fossil fuel potential. It was an intense emotional experience for me personally and for one of the finest geophysical teams ever comprising K. Satyamurthy, M.V.Joga Rao, B.S.R. Murty and P.D. Venkateswarulu.

Rajasthan: The Western Indian shield of Rajasthan was the next to beckon with its vast metallic and nonmetallic mineral potential. The time honored practice of following the footprints of ancient mining had largely given place to chasing AEM anomalies relying almost solely on geochemical evaluations with few other supporting inputs. There was clear need to revisit AEM results in their entirety against the backdrop of their structural settings local and regional. While Aeromag maps were helpful up to a point, knowledge of large scale denominators, if any, governing spatial and temporal distribution of the various mineral belts in this unique metallogenic province was unavailable despite years and years of earlier exploratory effort. Intending to fill this lacuna, a regional gravity coverage of this part of the Indian shield was launched during the second half of nineteen seventies. It was selectively supported by shallow hole temperature measurements by an indigenously fabricated thermistor device with a view to arrive at lateral variations in heat flow. The end product of this program was a set of Bouguer gravity maps produced on a scale of 1 : 250,000. This was the first systematic effort of its kind aimed at guiding not only mineral exploration but also geoscientific studies of any kind in future. There is word that these maps are being actively put to use. I am proud of my friends T.S. Ramakrishna and K.V.S. Bhaskara Rao without whose enormous effort this program would not have progressed or borne fruit.

It may not be entirely speculative that this overall gravity picture could have an archaeological dimension as well. The major horst like structure defined by gravity might have been the culmination of several episodic movements. Should these episodes be differentiated and dated? This question could have a bearing on the disappearance of the not so “mythical” Saraswati River further to the north. Indeed it may open up some exciting possibilities in the field of research related to Prehistoric India.

Airborne surveys: I had the privilege of being involved in systematic airborne geophysical surveys in the country. The operations were two fold in genre: (i) Low altitude detailed multisensor mapping of greenstone belts for economic targets and (ii) Systematic aeromagnetic reconnaissance of the country at higher altitude with wider line spacing. Among other things the multisensor program led to an interesting correlation between known gold occurrences and anomalous concentrations of the isotope K-40. This evidently empowers airborne spectrometry with capability to detect potential auriferous areas. The high level aeromag coverage between 8°N and 12°N latitudes

has given fresh insights into the architecture of the southern part of peninsular India. This region as a whole is shown to be constituted of individual crustal blocks with evidences of epeirogenic activity. In what measure is this true of the rest of the subcontinent? What are the consequent implications to the geological evolution of this part of the earth, its volcanism, metallogeny and above all its contemporary seismicity? These are fascinating questions to be addressed.

Compilations: There is no denying that we grow wiser from hindsight and that was the driving philosophy behind two compilations. One of these was an Album of geophysical responses over sulfide bodies embedded in diverse geological milieus in Rajasthan. It could not have materialized without the informed and zealous support of my wonderful colleague I.C. Madhusudhan. Serving as a handy reference, this little book can help strategize field operations optimally keeping in view the local geological environments. For instance an impressive ensemble of sophisticated methods and techniques deployed in a certain area in southern Rajasthan had totally failed due to hostile geology. Replacing these with simple magnetic profiling led to the discovery of one of the largest lead-zinc ore bodies that is being actively mined today. The second compilation is a flash-back of geophysical activity in GSI over a period of four decades. This was a massive effort that would not have fructified without the persuasive and persevering efforts of my friends B.S.R. Murty and Kesava mani.

Seismicity: A passing mention of my dabbling in intraplate seismicity before bowing out of GSI. In this context, I would strongly renew my plea to the geoscientists to resort to a combined analysis of gravity and heat flow data in the country to lead us to recognition of rheological anomalies which are the real culprit witnessing local stress build-ups.

Looking Back: I feel that I was riding high on an exciting learning curve all the way! There was not a dull moment for me during those thrilling thirty five years, one month and twenty days to be exact! And I owe it all to L.N. Kailasam who ignited the spark and whetted my appetite for geophysics.

PROF. PEMMARAJU SITAPATHI RAO

Prof. Pemmaraju Sitapathi Rao was born in 1933 in Nadavapalle of Amalapuram taluq, E.Godavari district, A.P. Mr. Pemmaraju Sitapathi Rao had his early education in Nagaram and Rajole of East Godavari district. Graduated from the Government Arts College, Rajahmundry.Obtained M.Sc. degree in Applied Geophysics, from Andhra University in 1954. Mr. Rao took to research in 'Gravity and Magnetic surveys of Godavari valley' under the guidance of Prof. V. Bhaskara Rao with the overall expert supervision of Prof. M.S. Krishnan. With the excellent fillip rendered by pioneering geoscientists, Prof. C. Mahadevan and Prof. B.S.R. Rao, Mr. Sitapathi Rao carried out extensive gravity and magnetic surveys over the now-famous oil-rich Bhimavaram-Tanuku ridge, which culminated in a thesis for the Doctor of Science degree by the Andhra University in 1964. He is responsible to start the Palaeomagnetic studies in the Department and established collaboration with the TIFR, Bombay. Starting his teaching career as a Demonstrator in the Department of Geophysics in 1957, Dr. Sitapathi Rao became a Lecturer in Geophysics in 1963 and Reader by 1976.

Recognised for his consistent work on Palaeomagnetism, Dr. Rao was offered a Post-doctoral fellowship of the National Research Council of Canada to work in St. John's University, Newfoundland under Prof. E.R. Deutsch, the eminent Palaemagnetician. Dr. Rao's stay in Canada is marked by outstanding scientific events like Labrodar expedition in Arcitic cold, Atlantic cruise with Prof. Lilly, participation in the Annual Convention of Royal Society of Physicists and befriending eminent scientists like Prof. Jhon Dewey of U.K. Having returned from abroad Dr. Sitapathi Rao continued his scientific achievements in the fields of rock-magnetism, palaaeomagnetism, groundwater exploration, seismology and forecast of earthquakes in Indian subcontinent in collaboration with Prof. V.L.S.

Bhimasankaram. His school of work bloomed and half a dozen students got Ph.D., under his guidance with over 100 publications in National and International Journals. He visited U.S.A., Canada, Germany and many West Asian countries and participated in academic activities.

A land mark in Dr. Sitapathi Rao's journey in Geophysics is his visiting Professorship to Alfateh University, Tripoli, Libya in 1983, where he was responsible to start a degree course in Geophysics and initiate research activity in Petroleum investigations. He became a Professor in 1985 with necessary and sufficient background of an able teacher and an active researcher. Prof. Sitapathi Rao served the University in various capacities as the Head of the Department, Board of Studies Chairman, Academic Senate Member, Asst. Principal and member of various committees of U.G.C., C.S.I.R., D.S.T., N.G.R.I. and O.N.G.C., by virtue of his scientific capability,personality and integrity.

He served the Department of Geophysics for over 35 years, with sincerity of approach. He is a Fellow A.P. Academy of Sciences, Association of Exploration Geophysicists, Association of Hydrologists of India and various social organizations of Visakhapatnam. His long journey to the top, through mostly self made, was assisted partly by his life partner Mrs. Indira and also by his friends, admirers, students and colleagues.His righteous indignation towards the wrong and faith in the Indian dictum yaatho Dharmathathojayam made him a successful man and then an able academician.

After his retirement from service in July 1993 he is leading a peaceful life in Visakhapatnam.

P.R.Reddy