SP Chatterjee Memorial Lecture

By
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Geospatial Divide in India: Roots, Repercussions & Remedies

Hon'ble dignitaries on the dais, dear delegates to this Cartographic Congress, ladies and gentlemen,

It is indeed an exultation for me to be invited to deliver an endowment lecture at INCA Congress, and an enhanced delight that it is Padmabhushan Prof. SP Chatterjee memorial lecture – for the very high regards which I personally cherish for this stalwart geographic-cartographic personage of India. My special reverence to him derives from the fact that he cultivated a special genre of Cartography that can best be conceptualized as Geographical Cartography. And this initially appealed me immensely as an appropriate theme for this talk.

Prof. SP Chatterjee Phenomenon

This endowment lecture has been running for well over a decade; and the highlights on the life and work of Prof SP Chatterjee may look common platitude to the senior members and delegates here. But no; I have my own angle of looking at the SPC phenomenon; and then there are new guests and younger delegates here who, I believe, will find it instructive and inspiring to know about him and his contribution.

The SPC Phenomenon – Prof. SP Chatterjee was an epitome of Geography and Cartography blended in one; had a larger vision of Geographers' role in nation building; his Superlative Carto.-Geog. contributions – 'Bengal in Maps' (1949) – very simple cartographically and superb in terms of Geographic Analysis and interpretation. 'National Atlas of India', and 'Damodar Valley Planning Atlas'.

After earning doctoral degrees in Geog. from Paris Univ. and in Education from London Univ. SPC joined Calcutta University. instituted Calcutta Geog. Soc. and founded the Department of Geography around the turn of 1940's and fostered it all through his life. He also started special paper in Cartography, and worked on his 'Bengal in Maps' (1949) under the most tumultuous conditions.

His contributive career is mainly spread over 1940's through 70's, which, incidentally, coincides well with growth span of Academic/Geographic Cartography, particularly in US. 1950's-60's comprise the zenith of his glorious career, when besides raising the National Atlas he made India's presence eminently felt in the International Geographical Union and conspicuously participated in its 1952 IG Congress at Washington, 1960 IGC at Stockholm, and 1964 IGC at London. Elected the IGU Vice President in 1960 and President 1964, he urged the Govt. of India to host next IGC; and for the first time the IGC was held in Asia - at New Delhi in 1968 under his stewardship.

Early in 1950's PM Pt. Nehru complimented him for his 'Bengal in Maps' and evinced a need for a similar database in map form for national planning; Nehru indeed wanted it too urgently. Undaunted, SPC accepted the challenge. Starting in 1956, he presented the first maps in 1957; and the landmark project of National Atlas of India was put on rails. Very first few plates of the Atlas created ripples internationally; and Royal Geographical Society, London felicitated SPC with Murchison Award in 1959. He was the pioneer of Geographic Cartography in the country.

As founder director of National Atlas of India (since renamed National Atlas and Thematic Mapping Organization), SPC made special contribution to this project by way of:
1. Designing the National Atlas of India into 1:6M all-India plates, a set of 16 1:1M main, detailed plates for each major theme, and a set of five 1:2M plates to cover India as general geographical maps as also for specific combo of themes at medium scale;
2. Devising a scheme of physiographic division of India, which markedly enhanced the value of Physical Plates;
3. Giving very sound and succinct geographical interpretation of each map;
4. Initial batch of work force were mostly his own Geog. students specially groomed by him for specific Cartographic jobs,

5. National Atlas of India is one major National Institute manned and managed essentially by Geographers.

These highlights of SPC Phenomenon signify that by the very comprehensive and correlative nature of his subject, a sound, genius geographer can make landmark contribution to Cartography and apply the two disciplines towards problem solving and national planning. SPC stands as the archetype model of that acumen and achievement, and his Damodar Valley Planning Atlas is a perfect example.

21st IGC-cum-III ICA Meet at New Delhi in 1968 was a grand event: a number of major publications including the first 'Census Atlas of India', 'Economic Regionalization of India', and 'Mountains and Rivers of India' were released. The joint session of IGC and ICA was to be chaired by the celebrated cartographer, Erwin Raisz, who, alas, suffered a fatal brain hemorrhage while he was on his way to New Delhi.

Though SPC is best regarded for creating the National Atlas; however, for him National Atlas was but a component in his larger vision of the role of geographers in nation building that India was so fervently striving for. For this he cherished a National Institute. of Geography, much on the line of Polish or Russian Institutes. (Utterly baffling enough, this plan could not come through; but that is a different story.)

Rather late – in 1985 – SPC was felicitated with Padmabhushan.

Geospatial Divide in India:
Root, Repercussions and Remedies

While first exploring Geographic Cartography as an apt theme for this talk, I realized that map production and usage practices have seen a sea change since the prime years of SPC, and now stand subsumed within Geospatial Science. This computer-suave, sophisticated technological gamut additionally depends on Internet services and functionalities. However, only a modicum of people is coping up with these rapid developments, and vast masses are left ever more behind, creating the formidable chasm in development scenario of the country. I deem this a more warranted and opportune theme.

Tall Vertical Stance Sans Proper Horizontal Base – While we feel proud at the high position of India in ICT & Geospatial Techs. in the comity of nations, we cannot ignore that this is only a high vertical stance without commensurate horizontal base, because massive chunks of Indian populace still cannot or do not routinely use pertinent techs. and gazettes. This underpins that ICT and Geospatial development needs must involve a societal upheaval in this respect. Only then: 1. Our growth in these fields will stand more balanced, 2. Its benefits will substantially reach to the grassroots, and 3. The Digital and Geospatial transformation will come full circle in the country. This warrants an urgent action.

Digital vs Geospatial Divide - In modern era of ICT development, where every process and technique has changed from analogue to digital, this visible gap between those few who can and do use it profitably and the masses who cannot or do not use it is now called Digital Divide.

Though closely related to and sharing much with it, Geospatial Divide specifically refers to the deep chasm between the few who can deftly and profitably use GI on computers and Internet for practical purposes, and the huge mass of those who do not have an easy access to or otherwise cannot efficiently use GI and related services on Internet & Geo-Web. This divide is doubly accentuated, as the use of analogue map itself has been historically very bleak in this country. It is therefore not only more urgent but also calls for special efforts. It must be underscored that both these divides are but an extension of the deeper, more general socio-economic chasm between the so-called 'Haves & Have-nots' now better couched in terms of 'Knows & Know-nots'

Geospatial Divide: Analysis And Genesis - Multifarious factors have been operative behind it: historical, economic, socio-cultural, national security-related, administrative, and attitudinal.

Historically, mapping and map use have been very week and neglected practices in India. When Europeans, particularly the British, started serious mapping efforts, they doggedly kept map from their European rivals as well as from Indian states and general public. Eventually, India became the best-mapped large country of the world around the turn of 20th century – only not meant for Indians. Prodded and tuned to make-do without maps for centuries, people also grew indifferent and apathetic to maps. It is indeed surprising how the British could so easily prod the Indian public and the Princely States to make do without maps. One can only guess that the historical indifference of the people and administrative machinery to mapping and map use for practical purposes might have been the principal factor. After Independence, the new Govt.'s attitude didn't change readily. And by the time it might, new internal security threats

propped up, and forced the Govt. to refrain from slackening map control.

Socio-Economic factors are much meshed-up. Poverty over generations, coupled with illiteracy is germane to people's mindset mired in exclusive concern with their immediate basic needs. Colonial alienation and language barrier further accentuated public apathy to maps-use.

When education was restarted by the British, maps surprisingly became the sole preserve of Geography in schools and colleges; and other humanities and social sciences as if assumed a peculiarly indifferent stance to them – History, Economics, and other social sciences as if chose to do without maps. In the West, Historical Atlases outnumber general or Geographic Atlases.

Language Barrier – This is the most fundamental and insidious barrier. With the advent of English education English language became a big influence in the country. Though English as lingua franca served its purpose well - not only for the colonial rulers but also for the educated gentry at large. However, English-educated gentry, though very important and progressive, were always a strict minority in the country. Nevertheless, the prestige and clout of English education, and the socio-economic prospects that would or could open through it, actually added new dimensions and depth to the age-old disparity between the Rich and the Poor in country. It created English-wise disabled masses around the minuscule English-flaunting gentry in India.

As the British global empire reached its arch zenith and English rose to be virtually the World language, the rigorously taught English became a special asset of Indians. Now when education in India is spreading widely this asset of English with Indian gentry is fast eroding, particularly in the Hindi belt; it needs to be preserved to maintain our competitive edge in the world.

Disparate Education Systems - In a way, education program in the country is going on two parallel lines – the English-medium education and the Hindi or vernacular medium education. And there is a wide disparity between these two streams. Rich libraries with excellent books and journals serve only those who can cope up with the English language. Books in Hindi or regional vernaculars are few and far between and often very poor in content quality and get-up. Maps, atlases, globes etc. in Hindi are in a dismal state.

Particularly, the ICT and Geospatial literature and Apps as well as Internet and WEB services are all available in English. Only recently have some services just started in Hindi or other vernaculars also. There is immense scope and need to do a lot more about it.

Negotiating The Divide – Current efforts – Translating textbooks is an age-old strategy, and Hindi Grantha Academies in the Hindi belt are active in that direction. However, the translated language lacks natural feel & flow, and often becomes unpalatable with teachers and no less unintelligible with the students. A plausible alternative would be to select textbooks and have special contracts with their authors and/or publishers; and then motivate potential authors to write, or present a rendering of, pertinent textbooks, using the original books as base model and structure, and mostly as source of ready maps, figure and diagrams. This may additionally embolden some promising writers to eventually author their genuinely own books.

Bilingual Popular Books – Yet another approach can be to organize more illustrative, introductory or popular type books as two or four page spread of each rather small topic, and place simple English version and figures on the left page, and their Hindi or vernacular rendering on the facing page. Only, this requires special structuring and organization of such books into a large number of small topics. In this arrangement, teachers will find it easier to shift to vernacular medium, whereas the students will grasp what the vernacular version really conveys, and also gradually improve their ability to grasp things in English as well as in the vernacular medium. Incidentally, this will also boost their faltering grasp on English.

MAPS - Cartographic translation or transcription was always a formidably difficult task. In the digital era, the toponymy layer can more easily be modified and translated or transcripted.

A Radical, Bold Approach Evoked – Actually a more fundamental restructuring or overhaul of secondary education stands due & desirable. The divisive and dubious practice of filtering students after High School level into science stream for better ones and humanities stream for others, and then the very tardy and casual attitude towards Humanities education vis-vis science education in the very same institutions callously wastes the formative years of these students. It spoils them by enhancing initial differences of IQ and performance, and beguiles them into a casual and lackluster attitude. These non-Science people make the bulk of those who find it very difficult to cope up with Geospatial advances, or any technological advances for that matter.

Though Geospatial Science can rather easily be introduced as an extra subject to all students, I cherish a more radical and bold approach to introduce a new group of subjects – e.g. Geospatial Science with Chemistry and Physics – at the higher secondary level. Moreover, I moot an even more radical and bold approach to introduce an altogether new stream of science comprising Earth & Environmental Sc., Geospatial Science, and Fundamental Sc. – an integrated combination of Chem., Physics, and Biology at a rather moderate level.

These approaches involve steeply increasing challenges and problems in their implementation. Specially, the last approach is a daunting notion, as it involves tailoring and integrating the Chemical, Physical and Biological Sciences as a Fundamental Science. Worth of this new stream to students and society at large vis-à-vis other science streams is also a serious consideration.

While this approach is fraught with formidable challenges and doubts at the outset, it is our basic tenet that in the modern geo-information age every citizen must be reasonably conversant with these aspects, and a substantial proportion of youth should be poised to further pursue studies in these subjects or take up very many jobs in these burgeoning fields.

India is actually well poised to embark upon this project of Geospatial Education in schools – in terms of geospatial data, H/W and S/W availability, and other ancillaries; only a proper textbook and workbook for students and source book for teachers needs to be developed. If GIS S/W's are expensive, NRDMS of India has developed its own GIS S/W package called 'GRAM++', and P. Vankatachalam has developed a 'GISTUTOR' based on it; ITC's ILWIS is downloadable on-line, and ESRI's 'ArcView' can also be procured for only nominal cost. Excellent, relevant books are now available – like RH Audet & GS Ludwig, 'GIS in Schools' from ESRI (2000), and DR Green (Ed.), GIS; A Sourcebook for Schools' from Taylor & Francis (2001).

In 2010 Rolta India entered an agreement with CBSE Board to play resource partner to promote Geospatial education by way of offering gratis its Geomatica S/W licenses to all Hr. Sec. schools and help it frame Geospatial syllabus, and also to train some initial core staff. In 2011 the CBSE issued a circular inviting interested schools to start some vocational courses to all streams at higher secondary level including Geospatial Technology. The schools opting to offer the Geospatial Technology course would be provided with Geomatica S/W and training support from Rolta India. Relevant textbook on Geospatial Technology has also been prepared. However, I understand only some schools from Kerala took an earnest initiative in respect. Much more can and should be done in this area.

One specific need of course stands – training of some schoolteachers to start with and subsequently the incorporation of subject teachers in the school faculty. CBSE looks poised to provide this. India's EDUSAT programme on regional beam can also play a very important role in it if it can be presented in a proper mix of English and Hindi/regional vernaculars. Aspects of Physical Geography and Mapwork can be enhanced to make syllabus. INCA's MAP QUIZ is doing a commendable service in this area. The overall situation looks ripe and well poised; only a little motivation particularly in Northern and central parts of the country will kick start the engine.

This radical change will redress a wider malaise of the school education system of India, which leaves a large section of Indian youth unfit and ill poised to cope up with newer technological change. With this implemented, many more young minds will choose to join these newer technological fields, which will not only complement the HRD and capacity building endeavors of the country but will also substantially help realize the dream of Digital and Geospatial India. This endeavor will make good the traditional indifference of Indian people towards utilizing maps and other GI.

Bottom-line –
1. Unflinching power supply and the Internet with a steady, good speed are the basic prerequisites of the dream of Digital India.
2. Similarly, a clear and earnest data policy especially for geospatial data facilitating hassle-free access to data is a basic need; a truly functional NSDI.
3. Besides these, a widespread practical training (formal or informal) at using pertinent Apps, methods and gazettes to enable people for self-help at these chores, is crux of the matter.

Thank you, friends, for your patient and indulgent audience.

Michael Blakemore, Durham Univ. UK emphasizes e-inclusion – using ICTs in helping citizens to overcome the varied and changing exclusions from knowledge, skills, and services …., underpinning that will be achieving the

widest possible access to geo-information, and in communicating effectively to policy makers.

Barun Roy, 'the real digital divide is in the attitudes, the colonial-age 'ruler'-versus-the-'ruled' mindset.
Our policy makers are strongly influenced by the 'technocapitalism' and 'technoscience' belief set articulated by IT Gurus. … To be 'modern' is to embrace latest technologies, and to many nations in the world this is a constant game of playing catch-up with 'advanced' economies, not only in technology but also in governance – the World Bank mantras of deregulation, privatization, competition etc.
http://www.geospatialworld.net/article/gi-digital-divide-and-the-ondian-information-society/

After graduating in Geology from BHU in 1926, SPC had a brief stint at Rangoon University, and then proceed to Paris for his doctoral work, and thereafter to London for Diploma in Education, which he later enhanced as doctoral thesis. As he returned with two doctoral degrees he soon joined Calcutta University where he founded the Calcutta Geographical Society and the Department of Geography there around the turn of 1940's.

In a 1950 annual meeting of AAG at Clark Univ. Erwin Raisz convened the Committee on Cartography wherein he distinguished two genres of cartographers – the geographer-cartographers who would delve and deliberate cartographic concepts and theories, and even methods and procedures; and the cartographic technicians who are trained to professionally do one or more specific job/s of cartographic production – plotting, fair drawing-drafting, symbolization, toponymy, plate-making/engraving, color separation, and even printing. In other words, geographer-cartographers are essentially academic cartographers. They are scholarly intellectuals in these fields; however, their lack of actual job training in professional production milieu becomes their Achille's heel. Digging out and articulating the message of maps is again the especial art of these scholars. On the other hand professional cartographers are operators or technicians, who are mostly bogged down in meticulously doing their specific job, but are not oriented to academic or research activities. Dexterity and diligence is the hallmark of their acumen and workmanship. Fusion of the two genres is rarely to be seen in individuals. Those few who do or did evince both the genres are essentially exceptions like Raisz himself, or Eduard Imhof, or JP Goode, AH Robinson, JC Sherman, JF Jenks, Karl Peucker, or Max Eckert etc.