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## OPINION

### The need for removal of restriction on maps

*S. V. Srikantia*

As is well known, a map is a representation on a flat surface to an established scale and to a definite orientation, natural physical features and also man-made features wherever present, of a part or whole of the earth's surface by accepted signs and symbols. Map-making is as ancient as some of our civilizations, and the oldest available map in the world is a Babylonian map on a clay tablet dating 2500 B.C. India has a tradition of map-making from ancient times, as gleaned from the *Brahmand Purana* of 500 B.C., giving evidence of the art of map-making. A map was always considered as a source of useful geographic information. In modern society, maps constitute the most potent source of geographical, physiographic, economic, scientific and sociological information for all development and academic activities. Topographical maps form the essential base for geological mapping, geotechnical and environmental investigations, engineering works, agricultural, botanical, forest and soil surveys, defence planning, urban and rural surveys and other activities.

#### Map coverage and utility

India, with an area of 3,287,263 km<sup>2</sup>, is covered by both topographical maps and geographical maps and the Survey of India (SOI) is the principal maker of all maps in India. The topographical maps are on sufficiently large scales of 1 : 25,000, 1 : 50,000 and 1 : 250,000, enabling the individual features shown on the map to be identified on the ground

by their shape and position. These maps are useful to earthscientists, geographers, foresters, engineers, archaeologists, anthropologists, scientists, planners, prospectors, miners, teachers in schools and colleges, students, researchers, tourists, trekkers, mountaineers and others. The geographical maps on the other hand, are on a small scale of less than 1 : 250,000 or 1 inch to 4 miles that strict representation of individual features for identification on the ground is not possible.

There are nearly 385 toposheets on 1 : 250,000 scale covering the mainland and the islands under the sovereignty of the Republic of India and these are also called degree toposheets. Each degree toposheet has 16 toposheets of 1 : 50,000 scale and at present the whole country is covered by 1 : 50,000 scale rigorous metric surveys in more than 5000 toposheets. This is no doubt an impressive record for any country in the world and SOI deserves all appreciation for this achievement. Each 1 : 50,000 scale sheet contains four 1 : 25,000 scale sheets. More than 35% of the country has also been covered by 1 : 25,000 scale. Therefore, there is no dearth of modern toposheets. Guide maps on scales 1 : 10,000 and smaller are available for towns and cities in various states. In India, maps particularly on scales of 1 : 250,000 and 1 : 50,000 are in great demand.

#### Diverse restrictions

Topographical maps, as an essential tool of information, should be available to all

citizens as a matter of fundamental right. Unfortunately, the then colonial British Government in India, suspicious of its northern neighbours, introduced the principle of security of maps, which is still being pursued. The northern border skirmishes with China during the early sixties further hardened this policy. This restriction has several facets. Maps on scales larger than 1 : 1 million of areas about 80 km from the external boundaries and from coastline to onshore, including the whole of Jammu and Kashmir and the entire north-east region, and all the islands in the Arabian Sea and the Bay of Bengal, are classed 'Restricted' at the instance of the Ministry of Defence. This amounts to nearly 227 out of 385 degree toposheets being classed as restricted. The restricted toposheets are issued only to Government officials, educational and scientific institutions and semi-government organizations. However, in practice, only authorized government officials are allowed to indent for maps, and educational institutions cannot directly obtain them. Topographical maps, both for restricted as well as unrestricted areas which depict grid lines cannot be issued to civilians without the prior approval of the Ministry of Defence. Without grid lines maps lose some of their utility for easy location. Similarly aerial photographs falling within restricted or unrestricted areas are classified as secret/top-secret for the whole of India. Even the book *Gravity in India* by SOI is a restricted publication and even export of unrestricted maps is not allowed.

Many organizations in India have suffered professionally for lack of easy

availability of toposheets of the restricted category. This has placed a major impediment to progress without serving the security needs. Even geological maps without physiographic details, pertaining to restricted areas, prepared by the Geological Survey of India need clearance from the Ministry of Defence prior to their publication. In many cases, latitudes and longitudes are deleted and in some cases even exclusion of scale for the map is suggested making a mockery of the geographical information system and reducing the utility of geological maps. This practice of restriction on such valid geological information has placed India in poor light among the comity of nations. Despite extensive cartographic, geodesic, geophysical and aerial coverage of India, there is an awful paucity of essential information made available to needy scientists, research workers and organizations within the country as to imperil the scientific progress of the country. The restriction on toposheets has deprived mountaineers, whose fore-runners in the past prepared the most remarkable maps of inhospitable terrains, of the essential map information of the Himalayan regions.

#### Is restriction relevant

As scientists we have to examine whether this restriction of toposheets by the Ministry of Defence is justified and how relevant it is in the present scenario. Satellite photography has now revolutionized the map-making processes, and some of these satellites have very high resolution. India is planning to launch a satellite capable of

providing resolution of 2.5 m in pan-chromatic band, and an American Company, EOSAT is launching one that would offer 1 m resolution. Thousands of satellites are encircling the earth and these can recognize roads, buildings, installations, water bodies, rail lines, telephone lines, trees, vegetation, nature of crops, berthing of ships, airports, rocks, soil, dams, and canals besides providing a variety of remote sensing data. All this information is accessible through foreign commercial remote sensing agencies. The range and depth of satellite observation with regard to the so-called security aspects is so enormous, that the information contained in the 1 : 50,000 scale toposheets pales into insignificance. Moreover the 1 : 250,000 scale toposheets restricted by SOI due to security consideration along the external borders and coastline areas, are available for sale in London. Thus restricting toposheets has not served any purpose, other than negative impact on the working of Indian scientists.

Remote sensing techniques have brought about a sea change in vital data gathering. Almost every country in the world has access to this data which is marketed commercially by private agencies in the developed world. Satellites are capable of gathering data over a wide area and the data so available will be more homogeneous in nature than that collected through several ground stations, and are also spatially continuous. The data collected from satellites are amenable to easier processing and computation. Further, modern instruments like geographic positioning system (GPS) provide accurate location of any area with the heights. Gravity and magnetic data

obtained by satellites encircling the earth are easily available. In such a scenario the question arises as to what purpose the restriction on maps and other information has served.

#### Conclusion

In this age of virtual explosion of technological advancement in gathering vital information pertaining to land and human activities related to the earth, and rapid dissemination of information through the Internet, the restrictions placed on toposheets and maps is ludicrous. We cannot reconcile to the rule of restriction on maps when electronic eyes from across space peer into everything on the surface of the earth. This restriction denies us our fundamental right to information, flouts the democratic principle of access to data collected at the cost of tax-payers' money and restricts our valid professional activity. Hence this has to be opposed.

Indian scientists should make it clear to those concerned that derestriction of toposheets and making available other land-related information to Indian citizens will not in any way compromise the security of the country. It is time that the entire scientific community raises its voice and gets this archaic restriction removed once for all before the advent of the next millennium and thereby earn the gratitude of all citizens.

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## COMMENTARY

### Journal impact factors for the individual scientist: An unnecessary evil

*J. Gowrishankar*

In the last several years, the entity 'journal impact factor' has begun to take on a larger than life dimension in the assessment of the quality of journals and also of the research output of nations, their constituent institutes and universities and departments, and even of individual scientists therein. So much so that I know of several scientists who base their decisions to send manuscripts to particular journals because of decimal

differences in the impact factors between the different journals.

The impact factor is defined as the mean number of citations received in the current year by papers published in the journal in the preceding two years. I have recently come across two rather unrelated articles that discuss the relevance and value of the impact factor in assessment of research quality, which I wish to share with the readers.

The first<sup>1</sup> is a laudatory review published in *Nature* of a book authored by J. M. W. Slack, '*Eggs and ego: an almost true story of life in the biology lab*'. Unfortunately, I have not had the opportunity to read the book itself, but I quote from the review by Lawrence<sup>1</sup>: 'Nowadays, as Slack points out, assessment of researchers is not by the content of the articles, not even by their titles, but just by the *names of journals* in which