

Record Dept.

(43)

2081/1

17/250  
TECHNICAL PAPER No. 1

# Survey of India



## TOWARDS A NATIONAL SURVEY

### Relations between the Survey of India and Provincial Survey Departments

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PUBLISHED BY ORDER OF  
THE SURVEYOR GENERAL OF INDIA

May 1948.



## TOWARDS A NATIONAL SURVEY

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### Relations between the Survey of India and Provincial Survey Departments.

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There is no National Survey in India in the sense that the Ordnance Survey in the United Kingdom is the National Survey of Great Britain. The Survey of India which is a Department of the Central Government carries out some of the functions of such a National Survey, but by no means all of them. It is responsible for -

- (a) the geodetic framework on which all accurate survey work in India must be based.
- (b) the execution of topographical surveys (normally on scales of 1 inch to a mile and smaller) and the publication of maps based thereon.
- (c) the execution of large scale surveys for special projects, towns, forests etc.

There is a noticeable gap in the above responsibilities, viz., that the Survey of India has no responsibility for the cadastral surveys used for records of rights and revenue purposes. This work is carried out by Provincial Survey Departments independently of the Centre.

#### Surveys

2. The ideal survey system for any modern country is to have large scale map series covering the whole area of the country, based on surveys of the highest precision and including detail and contours required not only for cadastral survey purposes but also for topographical maps.

## 2.

From these large scale maps smaller scale topographical and geographical maps are produced by successive reductions and the omission of detail not required on the smaller scales.

A major function of these large scale maps should be to form an essential part of a system of registration of property rights. They also form a record of the absolute position on the earth's surface (i.e. co-ordinates in terms of latitude and longitude) of detail shown on them.

3. In India the above system is not in use. A geodetic framework of high precision exists, but for a variety of reasons the cadastral survey maps of provinces are based on survey control (generally fixed by traversing) which, although it may nominally be based on the Survey of India geodetic framework, is not generally of sufficient accuracy to be of value in the operations of the Survey of India. Further, the cadastral maps themselves are primarily concerned with the depiction of the boundaries of cultivation and individual holdings, so do not show enough topographical detail to form an adequate basis for the compilation of small scale topographical maps. A result of this is that survey work frequently has to be done twice over in the same area firstly for Provincial and secondly for Survey of India purposes.

4. An example of the defects of the present survey framework in Provinces was seen in West Bengal recently during consideration of the means of fixing boundary pillars between West and East Bengal. Here, an examination of Land Records Department survey data showed that :

- (i) this data had not been properly adjusted as a whole between geodetic triangulation stations (a most elaborate and highly technical task).
- (ii) not all the traversing was of the requisite accuracy.

The result of the above is that it is impossible to determine the latitude and longitude of many Land Records Department traverse stations in West Bengal with certainty. Further difficulties are the uncertainty as to which traverse stations exist and the absence in readily available form of lists giving their positions and descriptions.

As a consequence of this absence of reliable local survey data the boundary between East and West Bengal is likely to have to be fixed by connection direct to geodetic survey stations, an elaborate and costly process.

5. A further disadvantage of the present system is that it is necessary to base the numerous project surveys which this Department undertakes, on control freshly fixed by triangulation or traverse which adds considerably to the time and expense of the project surveys.

6. From the above it will be seen that -

- (a) Provincial Survey Department traverse data may often be of little or no value for any other purpose than the control of the cadastral maps based on it.
- (b) The cadastral maps of many Provinces, though adequate for revenue purposes, are inadequate as a basis for the preparation of topographical maps by reduction from them. It may be noted that the 1905 Government of India Survey Committee rejected the use of cadastral maps as a basis for preparation of topographical

maps owing to the defects noted here.

- (c) The relative positions of two cadastral maps on the surface of the earth may be hard to determine and the true location of a feature such as a new road on a series of cadastral maps is likely often to be impossible to determine from Provincial Survey data.
- (d) The absence of properly located Provincial Survey Department fixed points necessitates the duplication of a great deal of survey control work.

#### Map Publication

7. Most Provincial Survey Departments have some plant for map reproduction and publication. This is primarily used for the printing of cadastral maps which are usually on the scale of 16 inches to the mile. In addition to this cadastral map reproduction, it is normal for Provincial Survey Departments to prepare Thana, Tehsil and District maps showing village boundaries. These maps are generally prepared by reduction from the Provincial cadastral maps and although they are uncountoured and therefore cannot be regarded as adequate topographical maps, they are nevertheless used very largely by Provincial officials. One reason for this is that village boundaries are shown, and these are normally omitted from the Survey of India topographical maps.

If Provincial Survey Departments confined their map publication to cadastral maps, there would be little danger of overlapping between their work and that of the Survey of India. Once, however, they start compiling smaller scale maps, there is a definite danger of wasted

effort. For example, District officials who use one inch to the mile ~~thana~~ maps compiled by the local Survey Department are unlikely to use the Survey of India one inch maps, though for other purposes such maps must be published.

In the field of small scale map compilation and publication, there seems to be much room for close liaison between the Survey of India and Provincial Survey Departments to avoid unnecessary expenditure of public funds on map series which, with closer co-ordination, might sometimes be redundant. The Survey of India, having the most up to date map publication plant in India, is likely to be able to produce maps of better quality than Provincial Survey Departments, and its methods are constantly improving by study of the work of other countries. It seems desirable that so far as practicable provinces should benefit from this.

### Survey Training

8. Provincial Survey Departments often have their own survey training schools, and rely on no outside help in training. Survey technique is developing very rapidly and the Survey of India is endeavouring to keep abreast of the times by reviewing and adapting methods developed in foreign countries, and by developing its own methods. The most important development in survey technique in recent years has been in Air Survey.

In the field of training it is therefore considered that it would be of very great advantage to provinces were their survey training schools to keep in touch with Survey of India ideas.

The establishment of a Central Training School by the Survey of India at which certain classes of Provincial Survey personnel would receive training might

be considered.

### New Surveys

9. It is clearly impracticable now to attempt any drastic revision of existing provincial cadastral maps or of the data on which they are based; but it should be recognised that as the country develops and as land values increase it will become increasingly desirable for cadastral maps to be in the same terms as geodetic triangulation.

It is not known what new cadastral surveys will be undertaken in future as a result of the absorption of Indian States into Provinces or the grouping of Indian States, but should new cadastral survey work be undertaken, the omissions and errors of the past should not be repeated; and any new cadastral survey should be carried out to such standards and in such a way that it can be used as the basis for small scale topographical maps. This implies that some regulation of the standards of accuracy to be maintained by Provincial Survey Departments will be necessary and some supervision should be exercised over their general scheme of control framework for new surveys. Standards of accuracy must primarily suit local needs and so may vary; but the layout of all control framework must be soundly conceived, otherwise its eventual adjustments to the basic framework will be impracticable. Arrangements should also be made for certain Provincial survey stations to be preserved as permanent marks.

All the above points to the desirability of new cadastral survey work being carried out either with the assistance or advice of the Survey of India.



Action Now Required

10. After the initiation of the modern topographical survey programme in 1905 and the creation of Survey Circles covering India, certain Directors in charge of Circles were also ex-officio Directors of Survey of some of the Provinces falling in their Circles. In particular, the Director Eastern Circle, Survey of India, was for long the Director of Survey Assam and also the Director of Survey Bengal. In the Central Provinces, the Officer in charge of No 5 Party, Survey of India, was for some years the Deputy Director Survey, Central Provinces. In return for advice and assistance, the Province subscribed a certain amount towards the pay of the Survey of India officer acting as Director or Deputy Director Survey.

During the financial stringency of the 1930s, provinces were unwilling to continue their contributions towards the pay of Survey of India officers and the links between them and the Survey of India were severed.

Another method of giving Survey of India experience to provinces has been for this Department to transfer officers to Provincial Survey Departments. This has undoubtedly benefitted the survey work of these provinces very greatly; but it is not an ideal system, as an officer transferred to a province has to make his own opportunities for improving his technical knowledge and outlook, which are otherwise likely to remain stationary at the stage they were in when he transferred to the province. In this connection the Indian Survey Committee in 1905 observed as follows :-

"It has been suggested to us that too long a course of surveys under a Local Government, free from the discipline of the Department, is apt to lead, in the case of Provincial officers, to some falling off from the high standard of professional accuracy insisted on by the Survey of India."

While the above generalisation may be unjust to some able and energetic Survey of India officers who have transferred to Provincial Survey Departments, it must be recognised that, if an officer transfers permanently late in his service, there is a great temptation for him to relax, especially if the Provincial Government is itself not very interested in survey technical efficiency. Another defect of this system is that it has been usual to transfer officers from the Class II Service. The technical charge of surveys in a province is a big responsibility and it is considered that better results would probably be achieved in future by seconding Class I officers of the grade of Superintending Surveyor and bringing them back to the Survey of India later. Such officers would have every inducement to keep themselves up to date, as their future promotion in the Survey of India would necessarily be dependent on it. Young Class I officers would also be more likely to be progressive in outlook than older Class II officers and be prepared to experiment and adopt new and improved methods.


11. It has recently been unofficially suggested that some provinces would welcome a renewal of the relationship which formerly existed between the Survey of India and the Provincial Survey Departments. In my opinion, to renew this link between the Survey of India and Provinces would be of great value not only to the Provinces, but also to the Survey of India; and for this reason I think that, at the outset at any rate, the Survey of India might be prepared to give assistance and advice largely gratis.

12. The obvious officers to advise Provinces are the Regional Directors of the Survey of India whose circle limits now coincide with the boundaries of Provinces.

Without a study of Provincial activities, methods and requirements, it is not possible to say at this stage what would be the most useful form for this advice to take: and what economies could be affected by co-ordination.

It is suggested therefore that as a first step the Directors of topographical circles of the Survey of India should, by arrangement with Provinces, be appointed the Directors or, if preferred, the Inspectors of Survey for the Provinces and States in their circles, and that advice and assistance to Provinces and States in their survey problems should be a normal function of Directors of the Survey of India.

13. A highly desirable development which would, however, take many years to introduce fully, would be for all officers in charge of Provincial and State Survey Departments to be Survey of India trained; and in many cases it might be of advantage for officers on the regular Survey of India cadres to be seconded for duty with Provinces and later to return to the Survey of India on promotion etc. With the present shortage of staff in the Survey of India it would be sometime before it could afford to lend many officers to Provincial Survey Departments; but were the provision of such officers recognised as a normal part of its responsibility steps could be taken to recruit and train extra officers with this end in view. Similarly, there would probably be much benefit to Provinces in having some of their skilled technical staff (corresponding to the former Survey of India grades of Upper and Lower Subordinate) trained by the Survey of

India. One way of achieving this might be to arrange for the permanent transfer of certain Survey of India personnel to the Survey Departments of their own provinces during the later stages of their service when the rather more settled life of a provincial official might appeal to a member of an all-India Service with a liability to serve anywhere. 

14. The above notes do not claim in any way to present the whole picture and are put forward merely to suggest the desirability of a closer association between the Survey of India and the Survey Departments of Provinces. Each province has its own special peculiarities and problems and a system of co-operation which might suit one province might be quite unsuitable for another and more detailed suggestions and proposals should await an examination of the problems of those provinces who would now be prepared to accept the Regional Director of the Survey of India as their Director or Inspector of Survey.