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PRODUCTION OF A THEMATIC ATLAS OF ANDHRA PRADESH—A PILOT PROJECT

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PILOT MAP PRODUCTION PLANT
(C.S.T & M.P.),
SURVEY OF INDIA,
HYDERABAD (INDIA).

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PRODUCTION OF A THEMATIC ATLAS OF ANDHRA PRADESH
A PILOT PROJECT

BY

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ABSTRACT

Regional progress in developing countries depends, to a great extent, on integrated planning which in turn depends on a proper inventory of natural, human and man-made resources and economic status of the region concerned. The best method of providing these data to the planners is the graphic method in the shape of thematic maps of the area on various socio-economics subjects. Preparation of a large number of such maps involves lot to time, labour and expense and it is difficult for one single agency to do it. Pooling of resources and close cooperation between Central, State Governments and other agencies, therefore, becomes imperative for cartographic projects of this dimension.

This paper deals with the details of the procedure followed for preparing the "Planning Atlas of Andhra Pradesh" taken up jointly by the Osmania University and the Survey of India at Hyderabad from 1971-75. This is the first experiment of its kind in India where a State University and the National Survey Department have worked together to successfully produce a comprehensive thematic atlas for the use of the State Government at a nominal cost to them.

In this paper I have given details of this pilot project, difficulties encountered and have suggested solutions for similar tasks which may be taken up in future in India or elsewhere in developing countries. An effort has also been made to show how pooling of resources and fruitful cooperation between different agencies can facilitate production of complicated thematic maps so useful and essential for regional planning in developing countries.

INTRODUCTION

After attainment of independence in 1947, the Government of India embarked upon the ambitious task of rapid and all-round development of this vast country for ameliorating the lot of its teeming millions; which had been neglected through centuries of foreign rule. As a result a national apex body, the Planning Commission, was established in 1950, which evolved a schedule for systematic development of the whole country by a series of five-year plans. The first Plan covered the period of 1951-56. Presently India is in the middle of the Fifth Plan. All federating States and Union Territories frame their respective Five Year Plans in consultation and with the approval of the Planning Commission.

Planners cannot frame their plans without proper data about the human and material resources of the country. Availability of fairly accurate statistical data embracing various aspects of national life and their geographical relationship is, therefore, sine qua non for realistic and successful planning. Such data is continuously collected through periodical returns, field sampling and surveys and is generally made available to planners and research scientists in the shape of voluminous reports. Although data in this form is detailed and accurate; but its use by planners and others is, obviously, laborious and cumbersome. As such there can be no two opinions about the fact that economic and statistical data together with their areal relationship can be best represented only in the form of thematic maps.

With the above object in view, the idea of preparing a "Planning Atlas of Andhra Pradesh" for the use of the State Planning Department was mooted by the Head of the Department of Geography of Osmania University, Hyderabad, in July 1970 and was readily approved by the State Government.

THE STATE OF ANDHRA PRADESH

Here a brief description of Andhra Pradesh will be useful. Andhra Pradesh is one of the 22 States of the Indian Union. *Population-wise it is the fourth and %Area-wise it is the fifth largest/in the country. Its approximate

/State

*Population : 43,502,708 as per 1971 census.

%Area : 276,254 square kilometres.

geographical limits are from $12^{\circ} 37'$ to $19^{\circ} 54'$ North latitude and from $76^{\circ} 46'$ to $84^{\circ} 46'$ East longitude. It is bounded by the Bay of Bengal in the east; by the states of Orissa, Madhya Pradesh and Maharashtra in the north; Karnataka in the West and Tamil Nadu in the south. Thus it occupies a sizable chunk of peninsular India. Its terrain comprises the fertile coastal and river valley plains; forested hills of the Eastern Ghats[©] and parts of the Deccan Plateau. Krishna and Godavari are its main rivers. It enjoys a moderate climate for major part of the year and receives annual rainfall of about 700 mm almost entirely in the rainy season extending from June to September. Rice and other food grains, sugar-cane, tobacco, oilseeds and cotton are its main agricultural produce and machinery, textiles, cigarettes and food products are its major industrial products. Its mineral wealth consists of coal limestone, barytes, manganese, copper, asbestos etc.

For proper administration the State is divided into three main regions viz. Coastal Andhra, Rayalaseema and Telangana. It is further sub-divided into 21 districts which comprise of 195 taluks or 324 panchayat samithis* or development blocks.

COLLABORATING AGENCIES

Although the initiative for preparing the "Planning Atlas of Andhra Pradesh" came from the Geography Department of the Osmania University; but they did not have the requisite resources and know-how for carrying out the entire work by themselves. Collaboration of the Survey of India, the National Survey Department, was therefore sought for drafting and printing of all the maps. Hence the Atlas is a result of joint efforts of the Osmania University and the Pilot Map Production Plant of the Survey of India, partly financed by the State Government.

© Hill ranges paralleling the east coast of India.

* Panchayat Samithi is the smallest administrative unit for the execution of development plans in villages and a tahsil is the smallest unit for general administration.

CONTENTS OF THE ATLAS

The list of maps to be included in the Atlas was drawn up subject-wise and a dummy was prepared by Prof. S. Manzoor Alam, Head of the Geography Department of the Osmania University in consultation with the prospective users of the Atlas. The Atlas in its final shape contains 96 plates comprising about 300 maps together with the explanatory text. The latter is included in the beginning of the Atlas. The plates are:-

General and Administrative	4	
Geology and Soils	2	
Climate	7	
Natural resources	4	
Agriculture and Landuse	26	
Animal husbandry	3	
Power-resources	3	
Industries	6	
Transport	3	
Banking and cooperative	3	
Demography	22	
Regional Development	13	
Total	96	Plates

Majority of the maps are on 1:2,500,000 or 1:5,000,000 scales. Certain insets are on 1:6,000,000 and regional maps are on 1:1,500,000 and 1:2,000,000 scales.

Here it may be mentioned that valuable guidance of Prof. Janusz J. Klawe,* an experienced cartographer, was taken in designing the Atlas and its first few maps.

*Janusz J. Klawe, Prof. of Geography, University of Alberta Canada, was on a UN assignment with the Survey of India for the establishment of the Centre for Survey Training and Map Production, at Hyderabad from May 1971 to June 1972.

COMPILATION OF MAP MANUSCRIPTS

The Atlas was prepared at Hyderabad, the capital of Andhra Pradesh, also known as the twin city of Hyderabad-Secunderabad. It is a historic city of the world famous monuments of Charminar and Golconda Fort, having a population of about two million and sprawling in an area of about 300 square kilometres. The statistical and other information data needed for the compilation of various maps were collected mostly from Bureau of Economics & Statistics and Planning Department of Andhra Pradesh Government. However, Forests, Mining & Geology, Industries, Co-operatives and Highways Departments were also consulted where necessary. Help of the Census of India and Meteorological Department was also sought for the compilation of maps on demography and climate. Beside these, existing maps*, atlases and reports were also consulted whenever required.

Collection and collocation of the data and compilation of map manuscripts was done by the staff and research scholars of the Geography Department of Osmania University under the able guidance of Prof. S. Manzoor Alam and his associate Dr. Afzal Mohammed. The compilation cell comprised of three research assistants, four cartographers and a couple of computers. The outline base maps comprising coastline, boundaries and other topographic features were drafted and supplied by the Survey of India to enable the compilers to superimpose socio-economic information on them. The manuscripts were generally prepared on publication scale, in colours and on tracing paper. The compilation of manuscripts was commenced in 1971 and was completed by early 1975. Collection of statistical data from various agencies and its conversion into map language took quite sometime. A number of maps had to be redone on receipt of revised information.

*The publications consulted were: Irrigation Atlas of India 1972, Geological and Mineral Map of A.P. 1975, and International Map of Vegetation & Environmental Conditions, Regional Transport Survey of Andhra Pradesh 1963-64; Annual Report of South Central Railway 1970-71, and Survey of India maps on various scales.

DRAFTING OF MAPS

The drafting of maps by the technique of cartographic scribing was carried out under the overall supervision and guidance of the author of this paper at the Pilot Map Production Plant of the Survey of India, Hyderabad.

As already mentioned, first of all the base map showing coastline, administrative boundaries, etc. was prepared on 1:2.5 Million scale from a reduction of the published 1:1 Million State Map of Andhra Pradesh on the International (Polyconic) Projection. Blue prints of the base map were supplied to Osmania University for incorporating a variety of thematic information on them, in the manuscript form, by various colours and symbols. The design and the color scheme for final publication of the individual maps was decided in consultation with the Osmania University. Scribing of the line details/symbols, preparation of open window negatives for tints, and lettering was done on polyester sheets, with scribable and peelable coatings, imported from U.S.A. under the U.N.D.P.

Different cartographic symbols e.g. Choropleths, bar-graphs, circular and pie-graphs, spherical and square graphs and cartograms, were used, wherever suitable, to represent different types of economic, demographic and other statistical data. Lettering for each map was obtained in positive on strip film from Hadego photo-lettering machine, waxed and then manually cut and pasted in position on clear polyester sheets keyed to the scribed plates. A contact film negative, prepared from the completed lettering plates, was then used for proving and printing. Maps were drafted for printing with a maximum of four colours viz. black, yellow, red and blue, by Color-Trol technique for colour combination using half-tone screens of different densities and patterns. Coloured proofs on white plastic sheets were prepared by rub-on process, which were edited and corrections were carried out on scribed etc. plates for final printing of the maps. The entire drafting work was executed by a group of five draftsmen working under one group-leader.

PRINTING OF THE ATLAS

Printing of the Atlas maps was done in No. 104 (HBD) Printing Group of the Survey of India attached to the Pilot Map Production Plant at Hyderabad. Press plates were prepared on grained and sensitized aluminium sheets by photolithographic process, by emulsion-to-emulsion contact with the scribed etc. plates, or film negatives. Press plates for each of the three colour tints i.e. yellow, red and blue were prepared by successive exposures of the open-window negatives through appropriate screens on to the sensitized plates. Printing was done two-up and on one side of the paper only. Thus, for each set of two maps, a maximum of four press plates only were used. Printing was done mostly on single-colour Roland Record offset press.

The descriptive text and explanations of the individual or series of maps were written by the authors of the map manuscripts in the Osmania University, and were composed in the University letterpress. But their bulk printing was done at the Survey of India press at Hyderabad by off-set process.

TIME AND COST

Although the proposal for the preparation of Andhra Pradesh Planning Atlas was put forth and approved in the latter part of 1970; the actual work of compilation and scribing was commenced in 1971 and was completed by October 1975. Materials for the completed maps started going to the press from March 1974 and printing of all maps was completed by the end of 1975.

Cost of the Atlas was shared between the Government of Andhra Pradesh, through Osmania University, and the Central Government, through Survey of India. Approximate cost figures are given below:-

	<u>Cost borne by Osmania University</u>	<u>Cost borne by Survey of India</u>
1. Compilation of manuscripts	Rs. 62, 000	-
2. (a) Cost of scribing	-	Rs. 1, 90, 000*
(b) Cost of base materials.	-	Rs. 13, 000**
3. Cost of Paper	Rs. 38, 000	-
4. Cost of printing including cost of photo lab work	Rs. 20, 000	Rs. 33, 000
5. Cost of binding	Rs. 16, 000	-

* Direct cost without departmental overheads.

** Cost of materials received from U.N.D.P.

Overall cost came to Rs. 3, 72, 000 and was shared by Osmania University and the Survey of India in the ratio of 2:3. Thus cost of each plate worked out to Rs. 3, 875. But the Atlas has been priced at Rs. 200 per copy.

DIFFICULTIES ENCOUNTERED AND REMEDIES SUGGESTED

Preparation of the Andhra Pradesh Planning Atlas, being the first job of its kind undertaken by the Survey of India in collaboration with a teaching university, a number of problems had to be faced. These problems and the suggested remedies are given below for further guidance:-

(a) Owing to difficulties of collecting up-to-date data on so many subjects from various sources and the huge volume of work involved in its processing and conversion into cartographic language, the flow of manuscripts was not prompt and regular. Therefore, at times the draftsmen had to be switched over to alternative work and sometimes they had to rush through. This resulted in delays, increased costs and some loss of quality. Regular flow of manuscripts to the drafting section should therefore be ensured by streamlining the channel of data collection and by employing experienced cartographers in the compilation cell.

(b) The K. & E. Stabilene Peelcoat which was available for making hundreds of window negatives had deteriorated. That is, its coating had become brittle and unpeelable due to age and exposure to tropical climate. Lot of time was therefore spent in scratching the coating laboriously from outdated material. It is suggested that the manufacturers may devise a peelable coating which like scribe-coat has indefinite shelf life under tropical conditions and also which should lend itself to photo-mechanical etching with indigenously available chemicals. This will definitely save labour and cost in drafting.

(c) Considering that printing of the Atlas maps by Color-Trol technique was undertaken for the first time at the Survey of India press, the printing quality is quite good. Yet there is ample scope for improvement with more experience and by use of better quality paper and printing inks.

(d) Printing of maps on one side of paper is somewhat uneconomical. With better advance planning maps could be printed on both sides of paper.

(e) Time taken and cost involved in the preparation of the Atlas are excessive. These can be substantially reduced by adopting the remedial measures suggested in sub-para's (a) to (d) above and with some more experience. A project like this should be completed in less than three years' time and at about half the cost. These targets can no doubt be easily achieved if automation is resorted to or by use of more modern techniques and latest equipment.

(f) The inclusion of section-wise explanation of all maps in the beginning of the Atlas is not a convenient arrangement from the point of view of users. It would have been better to place these opposite the maps concerned or in the margins by increasing the format of the Atlas.

USEFULNESS OF THE ATLAS

Now a word about the usefulness of the Atlas. The intention of the authors of this Atlas was to highlight the following four points about the State of Andhra Pradesh through a set of thematic maps at the micro-administrative level i.e. at the taluk level:-

- (a) Basic development and planning problems of the State.
- (b) The distinguishing characteristics and developmental problems of each sector of economy in the three regions of the State.
- (c) The regional distribution by volume and value of the existing and potential resources and their developmental prospects.
- (d) To identify the backward areas of the State with a view to preparing a scheme for economic regionalisation.

It is therefore expected that the Atlas will be of immense help to the various State government departments specially the Planning Department in framing the future annual and five-year development plans of the State. For this purpose it will be essential to revise and update the various maps periodically as the new data become available. This can be possible if the State Government sets up the necessary organisation on a permanent footing to work in close liaison with the Osmania University as well as the Survey of India.

The Atlas can also be useful to geography students and research scholars in various fields covered by the Atlas. The National Atlas Organisation may find it handy in compiling their maps. Above all, it can serve as a model for other States to follow in presenting inventory of their resources and basic development and planning problems in the shape of maps. However the next few years will show how useful this Project Atlas has proved to Andhra Pradesh, its people and to others.

CONCLUSION

Successful publication of the Andhra Pradesh Planning Atlas has been possible because of the tripartite co-operation between the State Government, the Osmania University, and the Survey of India. Similar pooling of resources between the states and the National Survey Organisation can be emulated by other states of India (and may be by other developing countries too) for producing thematic atlases which can prove a useful tool in tackling development problems for their regions. In this matter perhaps the U.N.D.P. could also provide financial and technical assistance wherever needed. As a matter of fact cartographic work and printing of this Atlas was done mostly with the help of the materials, instruments and equipment provided by the U.N.D.P. to the Survey of India for the establishment of their Centre for Survey Training & Map Production at Hyderabad.