Small scale socio-cultural thematic maps for development and administrative planning

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SUMMARY

Because of the domination of development and administrative planning by economists there has in the past been a concentration on variables that are mostly economic and measurable and a tendency to give insufficient attention to socio-cultural and socio-political variables. Now perspectives are changing and there is an awareness of the need to use more accurate and complete data on social and cultural phenomena. There is as a result a need to appreciate the contribution that geographers and cartographers can make. This article reviews the small scale socio-cultural mapping of third world countries. It considers the available range of such maps and carto-bibliographical guides, and proceeds to consider how socio-cultural mapping could be extended in a way that would be useful for development planners and administrators.

INTRODUCTION

The use of socio-cultural data for development and administrative planning in the third world has been largely ignored. This has been partially a function of the economists' traditional domination of development and administrative planning and their stress on strategies which have emphasized growth poles, maximized industrial growth, and concentrated investment where financial returns would be greatest. In their use of these and other approaches to development, economists and others have focused on a limited number of variables, mostly economic and measurable, in their efforts to plan, implement, and administer development (Natziger, 1977). In so doing, they have tended to ignore or to view as constants socio-cultural and socio-political variables.

Within the last decade, there has been an increasing awareness of the shortcomings of these approaches to development and administrative planning. Contrary to earlier expectations, the spread effects of these financially intensive and spatially concentrated forms of development have been slow to diffuse to rural areas, and their impact has been less than originally anticipated. In some cases regional disparities in living standards have increased dramatically instead of being reduced. Further, the perception of development as primarily an economic process has been shown to be unacceptable on many grounds. As a consequence, planners and administrators have begun to emphasize development programmes which aim to fulfil the basic human needs of the poor, to develop local self

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reliance, to improve citizen participation, to promote decentralization, and to focus on rural areas (de Man and Shaap, 1979; Jolly, 1977).

These changes in perspective have affected the types of data required for development and administrative planning and the methods of their presentation. In order to fulfil basic human needs, develop self-reliance, and increase citizen participation more accurate and complete data on social and cultural phenomena are required (Cochrane, 1979). This calls for contributions from a variety of social scientists besides economists, while the new accent on decentralization and rural development requires an increased appreciation, and employment, of spatial perspectives and the services of geographers and cartographers. The skills of cartographers in thematic mapping can be especially useful in the presentation of these data to those who plan and administer development activities.

Maps have frequently been suggested as useful tools in development planning and administration (Karo, 1963; Chapman, 1969; Taylor, 1978, Cochrane, 1979). Yet, the scope of map products which might be employed to facilitate different aspects of development is vast. Scale plays a large role in dictating the use to which particular maps can be put. It is often expressed in terms of a representative fraction which is a ratio of map distance to land distance. For instance, on a map with a scale (representative fraction) of 1:500, 1 unit of distance on the map equals 500 units on the ground. Cartographers often speak of large, medium, and small scale maps, although no exact definitions of these classes exist. Generally, large scale maps range in scale from 1:500 to 1:5000. The former scales are employed for maps of road and town construction, while the latter scales are used for cadastral mapping. A topographic map is an excellent example of a medium scale map. Maps in this scale range vary from 1:5000 to around 1:1,000,000. Large and medium scale maps are most frequently produced as unbound sheet maps whose dimensions generally run in excess of 50 cm on a side.

Small scale maps, on the other hand, are most commonly published in journals, books, and atlases, and consequently their size is frequently restricted to the size of the printed page. These maps are produced at scales of about 1:1,000,000 and smaller. Some of these maps may be no more than place name or location maps, but most small scale maps are used to illustrate the spatial distribution of a particular phenomenon or its interrelationship with another. These are thematic maps and they may be used to describe and analyse a diverse range of problems, including environmental, economic, and socio-cultural ones.

This paper reviews the small scale socio-cultural mapping of the third world and suggests it as a tool of significant utility for development planning and administration. The first portion of the paper identifies and examines various efforts at the socio-cultural mapping of the third world. In the following section, carto-bibliographic source material for the identification of existing maps as well as for the compilation of new ones is discussed. The final portion of the paper offers some thoughts on the production of small scale socio-cultural maps for development planning and administration.

SOCIO-CULTURAL MAPPING OF THE THIRD WORLD

A modest body of information on socio-cultural conditions in some parts of the third world already exists in map form. This material is concentrated in national atlases of third world nations, special regional and thematic atlases, and map series produced by research groups, universities, or private enterprise. A sampling of these materials is provided in the following paragraphs.

Some national atlases are produced with such thoroughness and at such a large scale that they might be employed effectively for development planning and administration. One of the best is the national atlas of the Ivory Coast (Ivory Coast, Ministère du Plan, 1971). A wide range of data on the physical, economic, and social characteristics of the nation is portrayed, chiefly on full-colour maps. The map scales are also commendable; with the majority produced at 1:2,000,000, while a few of the most important and complex are presented at the larger and more detailed scale of 1:1,000,000. Population distribution, for example, is presented at the latter scale. Another excellent example is the *National Atlas of India* (India, Department of Science and Technology, 1977) which contains two especially noteworthy map series, population and transportation/tourism, each comprising 16 sheets. These are produced at a very useful scale—1:1,000,000. *The Atlas of Uganda* (Uganda, Lands and Surveys Department, 1962), although dated, might well be employed as a planning tool, primarily because of its large scale maps, 1:1,500,000. Finally, the *Philippine Atlas* (Philippines, Fund for Assistance to Private Education, 1975) could prove useful, not because of its maps, which are published at a very small scale, but because the nearly 300 figures, graphs, and tables which focus on the historic, economic, and educational characteristics of the islands provide detailed statistics to supplement the cartographic presentation.

Many national atlases, however, are produced at scales too small to be of any direct use in development planning and administration. Nonetheless these atlases may at least be useful as sources of reference material and for providing a generalized areal representation of selected socio-cultural phenomena in a national or regional context. Atlases of this nature are drafted at scales of 1:3,000,000 or smaller. *The Atlas of Kenya* (Kenya, Survey of Kenya, 1959) is one such atlas. While its topical coverage is good, its scale, 1:3,000,000, restricts its use to only the most general problems. The more recent *Atlas de Madagascar* (Madagascar, Association des Géographes de Madagascar, 1971) falls into much the same category. It illustrates a rich variety of socio-cultural data cartographically, but at a scale, 1:4,000,000, which is less than optimal. Some national atlases, unfortunately, are produced at scales which render them almost totally useless for planning. Maps in these atlases are constructed at scales of less than 1:5,000,000 and for most practical purposes are useful only to schoolchildren and laymen. *The Atlas Nacional do Brazil* is an example (Brazil, Instituto Brasileiro de Geografia e Estatística, 1966).

In the larger countries of the third world, state governments or agencies may produce atlases that can be helpful. In India and Brazil such atlases have been published. The *Ethnographic Atlas of Rajasthan* (India, Superintendent of Census Operations Rajasthan, 1969) would be useful in evaluation of the social components of this Indian state, while *Andhra Pradesh in Maps* (India, Bureau of

Economic Statistics, Andhra Pradesh, 1969) presents a wide range of socio-cultural and economic information. Symbolization in the latter atlas is rather simple, with most distributions represented by pictorial symbols. In the former atlas, all distributions are represented by dots. In Brazil over 20 regional atlases have been published, and are listed and discussed by Johnson in a short paper in the *Canadian Cartographer* (Johnson, 1974).

Regional atlases and sheet map series of portions of the third world have been executed by organizations in the developed world. In the United States, for example, the United States Agency for International Development (USAID) has been responsible for the production of socio-cultural, economic, and physical maps of various areas of the third world. Under the auspices of the United Nations, USAID produced an excellent and very detailed atlas of the physical, economic, and social resources of the Mekong Delta (United Nations, Department of Economic and Social Affairs, 1968). Drawn at a scale of 1:2,000,000, the atlas depicts data on ethnic groups, population distribution, health facilities, education, transportation, and development activities, to name only some of the phenomena mapped. Although the legends are printed in only French and English, it is to be hoped that government planners and administrators in the same region today will find some of these data useful in addressing the problems which confront them. USAID was also involved in the production of maps and atlases for development purposes in the Western Hemisphere. Working in conjunction with the Army Corps of Engineers, high quality maps of several Central American nations were produced at scales between 1:500,000 and 1:1,000,000 (United States Army, Corps of Engineers Resources Inventory Centers, 1965a, 1965b, 1966a, 1966b, 1967). These maps were designed and printed so they could be used as single sheets or be held together with 'Chicago' screws in the form of an atlas. This is an excellent feature for the planner or administrator, who might wish to carry a few maps in the field without having to carry an unwieldy atlas, or who might want to compare two distributions by placing two maps side by side or by registering them over each other on a light table.

Some thematic atlases have also been published which have definite utility for planners and administrators. These include an atlas published by the Colombian Ministry of Education, *Colombia: Atlas Indigenista* (Colombia, Ministerio de Educación Nacional, 1977), which appears to have been executed at least in part to assist educational administrators in planning programmes suited for ethnically distinct local areas. The planning and provision of health services in Uganda was doubtless aided by Makerere University's publication of the *Uganda Atlas of Disease Distribution* (Hall and Langlands, 1968). Although published at a very small scale, Dalby's *Language Map Of Africa and The Adjacent Islands* (Dalby, 1977) could be useful in some planning and administrative contexts.

None of the previous atlases or map collections have been touted by their producers as being designed specifically for development planning or administration, although this idea is often implicit. A few atlases, however, have been produced especially to fulfil these purposes. One atlas series, subtitled *Graphic Perspectives on a Developing Country*, focuses on various third world countries. Atlases have been produced for Sierra Leone, Zambia, Tanzania, and

Jamaica (Berry, 1971; Davies *et al.*, 1972; Clarke, 1972; Clarke, 1974). These atlases are published at a small scale, but the maps are well conceived and well drawn. They provide data on various socio-cultural attributes, as well as a textual account and a list of bibliographic references for each map. A regional atlas of a similar nature but with greater areal coverage was produced under the auspices of UNESCO by Davies. This atlas, *Tropical Africa: An Atlas for Rural Development* (Davies, 1973), has maps at a scale of about, 1:20,000,000, and hence is of limited utility for planning. The main strength of the atlas may be in the diversity of socio-cultural and economic data it maps, suggesting themes worth portraying at much larger scales. Another development atlas produced for a region in Africa is the *Development Atlas* (South Africa, Department of Planning, 1966) which provides coverage of South Africa. Single map sheets of the entire country illustrate the distribution of various natural resources. Additional maps pertaining to agriculture and other aspects of economic and cultural geography were slated to be produced, but these were never issued. The scale 1:3,500,000, severely limits their use for planning and administration. Differing in the extreme from those atlases cited above, because of its comparatively large scale maps, is a *Working Atlas Of The Lilongwe Land Development Program* (Russell, 1971). This atlas is an excellent example of the sort of socio-cultural and economic mapping that should be done in conjunction with major development projects. The maps, published at the scale of 1:250,000, were originally produced to assist the project and staff personnel of the Lilongwe Land Development Programme in southwest Malawi. Later it was decided to present the maps in the form of a working atlas so they might be available to a wider audience and suggest possible mapping strategies to others engaged in similar development projects.

In some instances special map series have been produced of third world areas. One of the most impressive efforts now under way is organized by the German Research Society (German Research Society, 1976). This project, Afrika-Kartenwerk, has embarked on the systematic mapping of socio-cultural, economic, and physical characteristics of four areas in Africa at the scale of 1:1,000,000. A series of 16 maps and monographs for each area has either been completed or is in the process of being completed. Each of the four areas includes portions of more than one country. In north Africa the area covered focuses on Tunisia but includes sections of Algeria and Libya, while in southern Africa sections of Mozambique, Swaziland, and South Africa are mapped. The east African series centres on Lake Victoria and includes parts of Uganda, Tanzania, and Kenya. In west Africa, coverage concentrates on the Niger River Delta and encompasses much of Nigeria but only a small part of Cameroon. About half of the sheets in the series present data on the physical environment, while the remainder examine the area's socio-cultural and economic characteristics. Individual sheets illustrate population distribution, settlement geography, ethnography and linguistics, agriculture, economic geography, transportation infrastructure, medical geography, historical geography, and political geography. Curiously, no sheet is devoted to educational attainment or the state of the education infrastructure, nor are these data presented on any of the other sheets. The World Bank in a similar effort, has produced several excellent map sheets of Bangladesh (World Bank, 1972) at 1:500,000. These include maps of land use,

transportation, and administrative districts. These two map series, by the German Research Society and the World Bank, are models of the type of thematic mapping of the third world that should be pursued.

A similar, but less extensive and less detailed effort, was instituted by another group of German geographers at the University of Hamburg (Nuhn *et al.*, 1975). They produced a series of ten maps at 1:2,000,000 with accompanying papers for Central America (Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama). The maps focus almost exclusively on socio-cultural and economic characteristics of the region and detail political subdivisions, population distribution, ethno-linguistic groups, land use, industrial structure, communication/transportation, and exterior commerce. Although the scale is not as large as might be desired, there is enough detail on these maps for them to be of use to planners and administrators.

CARTO-BIBLIOGRAPHIC SOURCES FOR THE ACQUISITION OF SOCIO-CULTURAL MAPS

The previous section suggests that useful cartography is available to the development planners and administrators dealing with the third world. Yet, they are often unaware of the sources which could provide them with references to printed atlases, maps, and even maps included as figures in articles and books. In the mid-1960s, Drazniowsky (Drazniowsky, 1966) reported on various carto-bibliographic sources for map acquisition and map compilation, but since that time many new carto-bibliographic materials have been published. These new materials and older standard works are reviewed below.

Several major catalogues and indexes of maps and atlases have been published and many are available in a large university library. One of the most important of these sources is the index to maps in books and periodicals published by the American Geographical Society (AGS). The initial 10-volume series has been added to twice, once in 1971 and once in 1976 (American Geographical Society, 1968). Entries in this index are cross-referenced by topic and area, and represent maps published in periodicals and books reviewed by AGS. The AGS is constantly adding to its collection of map citations and all new citations are regularly included in the organization's monthly publication, *Current Geographical Literature*. Unfortunately, the AGS reviews very few non-geographic periodicals. A complementary catalogue is the 15-volume *British Museum Catalogue Of Printed Maps, Charts, and Plans* (United Kingdom, British Museum, 1967). Unlike the AGS catalogue, these volumes do not cite maps in books or periodicals, but only flat maps in the Museum's collection. A tremendous number of maps is listed, although many are dated or historical in nature and probably are not of too much interest to planners and administrators. In the catalogue individual sheets are listed by geographical area and then by topic. There is no cross-referencing of maps by topic. Two volumes published by Alexander provide international coverage of national, regional, and thematic atlases published between 1950 and 1975 (Alexander, 1971, 1977). Another recently published volume, *International Maps and Atlases in Print* (Winch, 1976),

identifies material currently available from publishers and map dealers around the world. It is to be hoped that further editions of this volume will be printed. Researchers who wish to keep abreast of recently published maps and atlases should consult Wise's paper on geographic and cartographic publications containing lists or reviews of current maps and atlases (Wise, 1975).

Several catalogues published by the United States government are of some utility in identifying cartographic materials pertaining to the third world. *The List of Geographical Atlases in the Library of Congress* (United States, Library of Congress, 1909–73), published occasionally by its Map Division, now comprises seven volumes, but only the last two are contemporary enough to be useful. Volume six contains references to over 2500 atlases of Europe, Asia, Africa, and Oceania received by the Library of Congress between 1920 and 1960. Volume seven lists atlases of the Western Hemisphere which were received by the Library of Congress between 1920 and 1967. Unfortunately the coverage of the underdeveloped portion of the Western Hemisphere is not extensive. Another U.S. government source is the semi-annual *Catalog of Copyright Entries: Third Series. Part 6. Maps and Atlases* (United States, Library of Congress, bi-annual). The number of entries for maps of foreign areas is rather small, two per cent. About the same proportion of foreign entries is found in the *Guide to U.S. Government Maps* published by a private organization (Documents Index, 1975).

Three bibliographies published in Europe provide references to atlas and sheet cartography. The best of these is the *Bibliographie Cartographique Internationale*, published annually since 1946 by the Centre National de la Recherche Scientifique (France) in association with UNESCO (France, Centre National de la Recherche Scientifique, annual). This publication is devoted entirely to the compilation of references to sheet maps and atlas cartography and is potentially very useful. Citations are listed by geographical region and a subject and author index are included. *New Geographical Literature and Maps*, issued quarterly since 1951 and published by the Royal Geographical Society (London), is an excellent reference tool, with 25 to 35 per cent of its contents devoted exclusively to map and atlas citations (Royal Geographical Society, bi-annual). Of less utility is *Bibliographia Cartographica* (Bibliographia Cartographica—Verlag Documentation, annual). It has been published under this name since 1973, and superseded the older publication *Biblioteca Cartographica*. At present this bibliography is focused principally on the cartographic literature, and only two small sections of it are devoted to atlases and maps.

Some regional carto-bibliographies supplement these serial sources. Within the third world, Latin America has received the majority of the attention. Monteiro's two volume, *Catalog of Latin American Flat Maps, 1926–1964*, represents an extensive review of both public and private map collections in New York, Washington D.C., Central America, and Mexico, as well as the collection of the University of Texas, Austin (Monteiro, 1969). This work supersedes the AGS's earlier carto-bibliographic efforts, *Catalog of Maps of Hispanic America* (American Geographical Society, 1930–33). The Bancroft Library at the University of California, Berkeley specializes in the collection of documents and printed material pertaining to Mexico, Central America, and the American west. Its index to printed maps and a supplement published in 1975 should be consulted by anyone interested in securing maps regarding socio-cultural characteristics of

Mexico or Central America (University of California, Bancroft Library, 1964). More restricted in their coverage are Adonias' publication on the cartography of the Amazon Basin between 1950 and 1961, and Palmerlee's detailed carto-bibliography on the small Central American republic of Costa Rica (Adonias, 1963; Palmerlee, 1965). Unfortunately the carto-bibliographical coverage for other regions of the third world is less complete than for Latin America. In any case, Ristow's *World Directory of Map Collections* is a useful guide to the location, coverage, and size of map collections in the nations of the third world (Ristow, 1976).

Topical carto-bibliographies are fairly uncommon, but Küchler's four volume *International Bibliography of Vegetation Maps* is an impressive contribution to the carto-bibliographic literature on maps and has utility for those interested in the socio-cultural factors associated with forest exploitation, grazing practices, and land use (Küchler, 1965-70)

THOUGHTS ON THE PRODUCTION OF SOCIO-CULTURAL MAPS

To date almost all comprehensive mapping programs either on a national or sub-national level have focused principally on the production of transportation, topographic and cadastral maps. Some economic or socio-cultural data may be included on these maps, but the inclusion of this type of data is of secondary importance and is usually inadequate for the development planner or administrator. Since socio-cultural mapping, especially in the third world, is frequently non-existent or of very poor quality, planners and administrators may often be obliged to attempt to produce socio-cultural maps, particularly if they are to successfully identify homogeneous development regions where economic and cultural development programmes can be successfully implemented.

A useful guideline for the production of socio-cultural maps is to select a mapping scale for which an existing map series can provide adequate base maps and possibly film negatives for actual map production. This allows for the standardization of spatial data with existing maps, and allows ready comparisons of the newly mapped socio-cultural data with information already provided on the existing maps. The use of existing film negatives can represent a tremendous reduction in production costs.

Several map series could provide suitable base maps for socio-cultural mapping of the third world. Hungary, the Soviet Union, and five other socialist countries have produced a series of maps of the world at 1:2,500,000 (Radó, 1974). The use of these sheets as base maps for socio-cultural mapping has much to recommend it, especially since its producers have expressed their willingness to have the series used as a base map for various kinds of thematic mapping (Radó and Papp-Váry, 1976). At one time it was suggested that Hungary, Bulgaria, and the Soviet Union were planning to publish a series of economic maps of the world using this series as a base (Nikishov and Preobrazhensky, 1971), but apparently this project has not yet materialized. The International Map of the World on the Millionth Scale (1:1,000,000), whose production is overseen by UNESCO, is also an attractive alternative for base maps for socio-cultural mapping. The maps published by the German Research Society, mentioned above, testify to the practicality of producing maps for development planning and administration at

this scale. The Japanese have found maps produced at this scale to be useful for agricultural planning (Ueno, 1963). Thus far, few have seriously suggested the systematic socio-cultural mapping of the world at the scale of 1:2,500,000 or 1:1,000,000, but such a project might be profitably initiated by UNESCO. This department already supervises the International Map of the World at the Millionth Scale and periodic regional cartographic conferences in the third world and hence would be a logical choice to undertake such a task.

Probably the most useful small scale socio-cultural thematic mapping for development planning and administration is done at scales between 1:250,000 and 1:500,000. *The Working Atlas of the Lilongwe Development Program* is a fine illustration of development mapping in this scale range (Russell, 1971). There are several map series in this range that might be useful in map production, but their coverage and availability vary tremendously from country to country. This more irregular coverage at larger map scales suggests that development planners and administrators who need maps at these scales may not always be able to capitalize on existing maps series and may have to produce their own base maps.

CONCLUSIONS

Socio-cultural data will play an increasingly important role in development planning and administration as a result of the new directions and mandates influencing the process of development. At the regional and sub-regional levels, small scale thematic maps can be a useful tool in the presentation and interpretation of these data. A rich variety of these maps is available and can be identified in a number of carto-bibliographic sources. In some cases development planners and administrators will not find the thematic maps they require and may desire to produce these themselves. In these situations it is advisable to use existing map series as base maps if these are available at a suitable scale. Two series provide world coverage at the scale of 1:1,000,000 and 1:2,500,000, and larger scale series are available but their coverage is not world wide.

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